BRIGITA MAŽENYTĖ-LUKOŠEVIČIENĖ

KNOWLEDGE TRANSFER IN OPEN HEALTH COMMUNITIES

DOCTORAL DISSERTATION

Kaunas
2024

KAUNAS UNIVERSITY OF TECHNOLOGY

BRIGITA MAŽENYTĖ-LUKOŠEVIČIENĖ

KNOWLEDGE TRANSFER IN OPEN HEALTH COMMUNITIES

Doctoral dissertation
Social Sciences, Management (S 003)

2024, Kaunas

This doctoral dissertation was prepared at Kaunas University of Technology, Faculty of Economics and Business, Centre of Excellence for Business Digital Transformation, Research Group of Innovation and Entrepreneurship, during the period of 2018–2023. The studies were supported by the Research Council of Lithuania.

Scientific Supervisor:
Prof. Dr. Monika PETRAITĖ (Kaunas University of Technology, Social Sciences, Management, S 003).

Scientific Advisor:
Prof. Dr. Rūta Jolanta NADIŠAUSKIENĖ (Lithuanian University of Health Sciences, Medical and Health Sciences, Medicine, M 001) (2018–2021).

Edited by: English language editor Brigita Brasienė (Publishing House *Technologija*), Lithuanian language editor Aurelija Gražina Rukšaitė (Publishing House *Technologija*).

Dissertation Defence Board of Management Science Field:
Prof. Dr. Žaneta GRAVELINES (Kaunas University of Technology, Social Sciences, Management, S 003) – **chairperson**;
Prof. Dr. Lina DAGILIENĖ (Kaunas University of Technology, Social Sciences, Management, S 003);
Prof. Dr. Hab. Ramunė KALĖDIENĖ (Lithuanian University of Health Sciences, Medical and Health Sciences, Public Health, M 004);
Prof. Dr. Inga MINELGAITĖ (University of Iceland, Iceland, Social Sciences, Management, S 003);
Prof. Dr. Kęstutis STAŠAITIS (Lithuanian University of Health Sciences, Medical and Health Sciences, Medicine, M 001).

The public defence of the dissertation will be held at 9 a.m. on 19 June, 2024 at the public meeting of the Dissertation Defence Board of Management Science Field in Rectorate Hall at Kaunas University of Technology.

Address: K. Donelaičio 73-402, LT-44249 Kaunas, Lithuania.
Phone: (+370) 608 28 527; e-mail doktorantura@ktu.lt

Doctoral dissertation was sent out on 17 May, 2024.
The doctoral dissertation is available on the internet http://ktu.edu and at the library of Kaunas University of Technology (Gedimino 50, Kaunas, LT-44239, Lithuania).

KAUNO TECHNOLOGIJOS UNIVERSITETAS

BRIGITA MAŽENYTĖ-LUKOŠEVIČIENĖ

ŽINIŲ PERDAVIMAS ATVIROSE SVEIKATOS BENDRUOMENĖSE

Daktaro disertacija
Socialiniai mokslai, vadyba (S 003)

2024, Kaunas

Disertacija rengta 2018–2023 metais Kauno technologijos universiteto Ekonomikos ir verslo fakultete, Verslo skaitmeninių transformacijų tyrimų centre, Inovacijų ir antreprenerystės mokslo grupėje. Mokslinius tyrimus rėmė Lietuvos mokslo taryba.

Mokslinis vadovas:
prof. dr. Monika PETRAITĖ (Kauno technologijos universitetas, socialiniai mokslai, vadyba, S 003).

Mokslinis konsultantas:
prof. dr. Rūta Jolanta NADIŠAUSKIENĖ (Lietuvos sveikatos mokslų universitetas, medicinos ir sveikatos mokslai, medicina, M 001) (2018–2021).

Disertaciją redagavo: anglų kalbos redaktorė Brigita Brasienė (leidykla „Technologija“), lietuvių kalbos redaktorė Aurelija Gražina Rukšaitė (leidykla „Technologija“).

Disertacija bus ginama viešame Vadybos mokslo krypties disertacijos gynimo tarybos posėdyje 2024 m. birželio 19 d. 9 val. Kauno technologijos universiteto Rektorato salėje.

Adresas: K. Donelaičio g. 73-402, LT-44249 Kaunas, Lietuva.
Tel. (+370) 608 28 527; el. paštas doktorantura@ktu.lt

Disertacija išsiųsta 2024 m. gegužės 17 d.
Su disertacija galima susipažinti internetinėje svetainėje http://ktu.edu ir Kauno technologijos universiteto bibliotekoje (Gedimino g. 50, LT-44239 Kaunas, Lietuva).

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND TERMS

Abbreviations

cHICO LAB – a research project titled "Development of Health Innovations in Holistic Communities: Creation of Open Educational Environments for Knowledge Integration (cHICOLab)", which involved collaboration between three universities: Kaunas University of Technology, Lithuanian University of Health Sciences, and Vytautas Magnus University
COVID-19 – Coronavirus disease 2019 (COVID-19) is a contagious disease caused by the virus SARS-CoV-2
CoP – Communities of Practice
DHC – Direct Health Communities
EU – European Union
HC – Health Community
KM – Knowledge Management
KT – Knowledge Transfer
KTF – Knowledge Transfer Framework
n.d. – no data
OHC – Online Health Communities
R&D – Research and Development

Terminology

Co-creation – a process wherein the input from consumers is integral throughout the entire process, from initiation to completion; any method by which a business enables consumers to contribute ideas, designs, or content.
Community Health – basic health services provided outside the hospital or clinic settings. Community health constitutes a subset of public health that clinicians are taught and practice as a routine part of their responsibilities.
Direct Health Communities – groups or networks where individuals engage in face-to-face interactions within physical spaces. These communities involve in-person communication and shared activities, fostering direct, tangible connections among the participants.
Health Community – a group of individuals with a shared interest in promoting health, preventing disease, or addressing the specific healthcare needs.
Healthcare System – encompasses the entirety of organizations, individuals, and activities with the primary goal of promoting, restoring, or maintaining health.
Hybrid (Mixed) Health Communities – integrate both direct and online elements, offering a blended approach that combines face-to-face interactions with virtual engagement. In hybrid communities, participants have the flexibility to connect in person and online, providing a comprehensive and adaptable support system.
Innovation – is the tangible application of ideas leading to the introduction of novel goods or services or enhancements in the existing offerings within the realm of goods or services.

Knowledge Dissemination – the process of spreading information, insights, and expertise to a wider audience or target group. It involves making knowledge accessible and available to the individuals or organizations who may benefit from it.
Knowledge Management Theory – a field that explores strategies and practices for effectively managing an organization's knowledge resources to improve performance and foster innovation.
Knowledge Sharing – the process of exchanging information, expertise, insights, and experiences among individuals or groups within an organization or community.
Knowledge Transfer – the act of disseminating knowledge from one person, group, or entity to another with the objective of improving comprehension, competencies, and innovation.
Knowledge Translation – the process of transforming knowledge, e.g., research findings into the practical applications to improve the outcomes in practice, policy-making, or other domains.
Medical Professional – refers to an individual who offers healthcare treatment and advice grounded in formal training and practical experience.
Online Health Communities – exist in digital spaces on the Internet, providing a platform for individuals to connect, share information, and support each other virtually on health-related issues.
Open Health Community – is a community which is purposively created for specific health issues and uses internal and external knowledge to co-create community-driven innovation in addressing health issues through the sharing of existing knowledge and the potential for co-creation and transfer of new knowledge to enhance healthcare.
Open Innovation – "is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006).
Openness – integration of the external ideas, technologies, and resources in the innovation process, fostering collaboration and knowledge sharing with a diverse range of stakeholders.
Orchestration – coordination and management of various elements, resources, or activities to achieve a specific goal or outcome. In the context of organizational management, orchestration involves harmonizing different components or stakeholders to work together effectively towards a common objective.
Organizational Behaviour – an academic discipline that scrutinizes the dynamics of individuals and groups within an organization, aiming to comprehend and shape human behaviour in the workplace or other organization.

INTRODUCTION

Relevance of the research

Incorporating the general public into the healthcare system is considered a critical element in driving healthcare innovation, and this viewpoint is substantiated by various compelling reasons. First, society has a big influence on the healthcare system and is directly affected by its results (Marmot et al., 2012; Kraushaar et al., 2012). Therefore, involving the public in the process of improving the health system can ensure that the healthcare solutions being developed are more effective and efficient (Frieden, 2010; Wallerstein & Duran, 2010). This represents a fundamental shift away from the conventional belief that the creation of new healthcare concepts and pathways are the exclusive domain of healthcare professionals. Patients are the first to have diverse experiential knowledge of living with various health conditions, and their input can help healthcare professionals to understand the patient challenges better (Castro et al., 2019; Jones, Jallinoja, & Pietilä, 2021; Beresford, 2019). Patients can as well offer valuable insights into the real-world healthcare experience, and their perspectives can help healthcare professionals to develop more comprehensive healthcare solutions. The public can help to identify unmet needs and gaps in the healthcare services (Ahgren & Axelsson, 2007). Therefore, the integration of public into the healthcare development is considered a critical factor in the advancement of knowledge management in the healthcare industry (Ramsay, Fulop, & Edwards, 2009; Bullinger et al., 2012; Sangiorgi et al., 2017; Patrício et al., 2020).

During the pandemic years of COVID-19, several key healthcare system issues emerged (Smith, 2020; Wanjagua et al., 2022; Leite, Lindsay, & Kumar, 2021; Goggin & Ellis, 2020; Liu, Shi, & Yang, 2022). A surge in demand for medical resources, protective equipment, and staff; the challenges related to the availability, accessibility, and scalability of testing; the inconsistencies in testing protocols; physical and psychological burdens; the resilience of the healthcare workforce became critical concerns. The issues of understanding health emerged critically to the wider public (Van Bavel et al., 2020; Vindegaard & Benros, 2020; Wise et al., 2020; Rubinelli et al., 2023). Several questions and problems have been raised regarding the nature of COVID-19 virus, i.e., fast spread issues, urgent symptoms, and untraditional treatment options. The efficacy, safety, and availability of vaccines have been questioned as well (Lazarus et al., 2021; Khubchandani et al., 2021; Davis, Golding, & McKay, 2022). Health information overload and misinformation were widespread. There were many difficulties in understanding the correct information and maintaining a common sense. In addition, high emotional stress related to the future was observed (Bavel et al., 2020; Lunn, 2020; Swire-Thompson & Lazer, 2020). The behavioural factors remained crucial to managing pandemics and show their high importance to the management to resolve health issues. It remained unknown how to navigate between different contexts (Budhwar & Cumming, 2020), how to improve the communication of the science (Rutten et al., 2021), how to ensure that the communities would have accurate information (Tangcharoensathien et al., 2020;

Bavel, 2020), how to reduce any form of misinformation (Roozenbeek et al., 2020; De Coninck et al., 2021; Van Der Linden, Roozenbeek, & Compton, 2020). The issues of trust, motivation, and uncertainty emerged in the health communities. The whole situation addressed the need for effective knowledge management in the health communities.

The socio-economic circumstances have a major impact on health; the access to healthcare, health behaviours, environmental factors, psychological stress, education, and health literacy can contribute to the health outcomes (Marmot, 2005; Phelan, Link, & Tehranifar, 2010; McCartney, Collins & Mackenzie, 2013; Jindrová & Labudová, 2020). A growing body of evidence underscores the significance of relationships, community, support systems, and social innovation in influencing the quality of healthcare. Social connections play as a support system and has positive interactions maintaining good mental health. It as well can influence the health behaviours and lifestyle choices, develop and implement effective health programs that address specific health issues within a community (Rifkin, 2014; George et al., 2015; Hoon-Chuah et al., 2018; Haldane et al., 2019; Sandvin-Olsson et al., 2020; Thompson & Burke, 2020; Russell, 2021). Furthermore, the transformation and advancement of public health are greatly facilitated by the rapid availability of information and the digitization of medical data. This phenomenon appears to empower patients by providing them with access to trustworthy health information and enabling them to play an active role in the healthcare decisions. However, it has brought changes in people's interactions and social connections, potentially leading to the spread of misinformation (Swire-Thompson & Lazer, 2020). Addressing social determinants of health through community-based approaches and social innovation makes it is possible to reduce health inequities and increase the general quality of health for individuals and communities. The socio-economic conditions are important and mean that the actual health management decisions are always rooted in the context, and communities have accumulated important pieces of knowledge and know-how, which is important and efficiently works for resolving health challenges in this context.

Overall, the inclusion of the public in healthcare can pave the way for healthcare solutions that are more effective and efficient and uphold ethical standards, catering to the diverse needs of populations. Community participation is essential in the management of health (Marston, Renedo, & Miles, 2020). The future success of global healthcare systems hinges on the imperative aspects of community engagement and the integration of diverse knowledge sources into the health innovation and collaborative development processes (Petraite et al., 2018). The research topic of this dissertation centres around the requirement for the development of effective knowledge transfer models tailored specifically to the open health communities. These models play a critical role in the creation and application of inventive solutions to the complex health challenges. The study investigates the multifaceted dynamics of knowledge transfer within these communities, emphasizing the significance of motivation and social networks as the main drivers that underpin the overall knowledge transfer process, which in turn significantly influences the success of

innovations. Furthermore, the dissertation takes a comprehensive view of knowledge management processes in innovation. These processes engender active participation and collaboration among a diverse spectrum of stakeholders within the open health communities, a strategy increasingly recognized for its potential to groundbreaking solutions to intricate health issues. It is worth noting that this dissertation contributes to the growing innovation and knowledge management literature. These fields represent critical domains of research, and the findings of this study are poised to expand the existing knowledge base, offering fresh insights and valuable perspectives. This contribution holds immense importance as it paves the way for more effective knowledge transferring and innovative problem-solving in the context of open health communities.

Scientific problem and the extent of its investigation

Corresponding to evolving but not yet sufficient scientific literature focusing on the relationship between knowledge transfer and its influence on the innovative inputs in the healthcare communities, this doctoral dissertation is constructed using a qualitative research methodology to reveal the challenges of open health communities in the processes of knowledge transfer. Greater understanding of how open innovation and knowledge management around the healthcare system works, which knowledge management cycle is crucial to get attention for better results, how the knowledge transfer models can bring more effective health outcomes are the missing points in the existing literature.

From the knowledge management theory standpoint, it is well-established that the standard knowledge management processes involve a multitude of interconnected activities. These activities include searching for knowledge, recognizing it, transferring it, sharing it, absorbing it, and ultimately, creating new knowledge. Knowledge management research in the health sector has been a fast-growing field; however, it is limited to knowledge management standards, weakly addressing knowledge transfer and new knowledge creation and especially open innovation and co-creation issues, where stakeholders play a critical role. According to Vidal et al. (2017), knowledge management plays a crucial role in facilitating collaboration and the transfer of knowledge among diverse stakeholders. They contend that a knowledge management system that enables the generation, capture, sharing, and utilization of knowledge can enhance the efficiency of open innovation processes within the healthcare domain.

Management sciences often aim to get a deeper understanding of the health ecosystem (Laihonen, 2012). However, in parallel, the importance of knowledge processes in health communities has been growing in the field of health management community-driven innovation. Still, knowledge asymmetries among professional, patient, and local communities remain high. Medical professionals often possess a limited comprehension of patients and their requirements, which may inadequately reflect the genuine perspectives of smaller healthcare communities due to the tacit nature of their knowledge (Bullinger et al., 2012). Therefore, there is a potential benefit in integrating community perspectives and leveraging 'experiential' knowledge

in community health, drawing from personal experiences related to the health issues. Experiential knowledge is one of the tacit knowledge categories (as well as subjective insights and doing (action)). Healthcare professionals more often use explicit knowledge, which consists of principles, procedures, processes, and concepts. The integration of experiential knowledge in knowledge management of healthcare should contrast formal, clinical knowledge and enrol innovations right to the problem-solving (Bullinger et al., 2012; Serrano-Aguilar et al., 2009). Health communities may be initiated by either patient who take the initiative themselves or the external stakeholders. It is essential for these communities to include not only patients but stakeholders and professionals from the biomedical value chain as well. This inclusive approach helps to expand the processes and enhance the validation and utilization of knowledge generated within the community, ultimately leading to the best possible outcomes. The patient role changes from the listener and knowledge user to collaborative, involved agent in their own health knowledge creation and integration together with other stakeholders (Allarkhia, 2015). Overall, the healthcare sector is evolving into a knowledge-based community with diverse stakeholders: patients, their relatives, caregivers, hospitals, pharmaceutical companies, the media, and more (Bose, 2003; Khan, 2014), who share a wealth of information and affect the quality of decisions of health issues.

Moreover, open innovation practices within the healthcare sector have yielded intriguing innovation outcomes and enjoy a widespread acceptance among the participants, including patients, medical experts, family or relatives, and the general public with an interest in healthcare (Bullinger et al., 2012). The open innovation model is rarely applied in healthcare practice but could be an excellent condition for maintaining the novelty and reliability of knowledge in the development of new models for knowledge management.

This type of research integrates networking, open and responsible innovation management, adult learning, and collaborative research, which are contextualized in institutional, social, and strategic healthcare environments. The latter context, due to its size, importance, institutional regulation, and active public participation, is characterized by an extremely complex structure, multiple numbers of participants, remote structures of knowledge and experience that are still dependent on the national, institutional, and cultural context. As a result, the study addresses the issue of health ecosystem transformation and seeks new approaches to empowering community-driven health innovations based on enabling health communities to integrate knowledge and collaborate.

Drawing upon the findings of the literature review and the identified research deficiencies, the novelty in investigating the mechanisms governing knowledge transfer within the open health communities, specifically focusing on the aspects, such as trust, motivation, and networks, resides in the requirement for a more precise conceptualization of the fundamental concepts that are central to this study. Furthermore, there is a demand for a more comprehensive and holistic approach to comprehending these mechanisms.

Several research gaps become evident when considering empirical analyses of the relationships and the impact of knowledge transfer on the community-driven health innovations within a real-world context. These gaps encompass the necessity to incorporate multifaceted factors and their intricate interplay. This involves recognizing the significance of socioeconomic circumstances, social interactions, and trust as pivotal facilitators of knowledge transfer. Additionally, it involves examining the role of motivation in perpetuating participation and sustained engagement within the open health communities.

To summarize the scientific problem exploration level, it can be concluded that although the separate part of the topic already gained some attention, there is still a lack of knowledge required to answer **the research question** raised in this study: how knowledge is transferred in open health communities, while taking into consideration its diversity, enabling and limiting factors?

The object of the research is the implementation of knowledge transfer processes in open health communities.

The aim of the research is to explain how knowledge transfer should be organized and enabled in open health communities in order to achieve community-driven innovation.

In order to achieve this aim, the following **research objectives** have been set:

1. To conceptualize the role of open health communities in knowledge transfer process;
2. To ground the conceptual relationship between the health community openness and knowledge transfer process within;
3. To develop a research methodology for the analysis of knowledge transfer process and its enablers in open health communities;
4. To empirically define knowledge transfer process peculiarities in open health communities and reveal critical enabling factors for successful knowledge circulation and co-creation;
5. To develop an empirically grounded model to facilitate knowledge transfer process within the open health communities.

Research methods and logic of the dissertation

The dissertation encompassed several distinct stages in its completion. Firstly, an extensive literature analysis has been conducted to establish a comprehensive conceptual framework for the implementation of knowledge transfer at the health communities with a contextual focus on open innovation. Secondly, a methodology for the empirical research has been developed, considering the research problem and theoretical analysis.

The research used qualitative method of the embedded case study. A methodology for the qualitative phenomenological study was created. Semi-structured interviews were employed to investigate the phenomenon of open health communities and knowledge transfer with regard to open innovation. These interviews aimed to validate various aspects of the conceptual framework.

In summary, the dissertation underwent different phases, including literature analysis, methodological development, qualitative interviews, data collection, data analysis, and development of the conclusions. The chosen methodology techniques were applied to achieve the objectives of the research effectively.

Scientific novelty and theoretical significance

This study expands the theory of knowledge management by offering novel insights into the dynamics of knowledge transfer within the open health communities. Traditional theories of knowledge management often emphasize the organizational settings, particularly large corporations or business sectors. This study extends the application of knowledge management theory to a new context by shifting the focus to health communities. It demonstrates that the principles of knowledge management are applicable not only within formal organizational structures but community-based health initiatives as well. Moreover, by synthesizing insights from diverse fields, it enriches the understanding of how knowledge is managed within the unique context of open health communities. This expansion of knowledge management theory shows the importance of collaborative and participatory approaches in knowledge transfer processes.

Secondly, through a meticulous analysis of scientific literature, this research has discerned the fundamental characteristics and conceptual elements of health communities, knowledge transfer, and the landscape of open innovation. After synthesizing the existing knowledge in these domains, the study lays a foundation for further inquiry and exploration.

While previous scholars concentrated on either macro-level health organizations or micro-level individual behaviours, this study breaks new ground by directing attention to the meso-level, specifically, examining health communities. When shifting the focus to this intermediate level, the research challenges the prevailing research traditions and offers fresh insights into the dynamics of community-based health initiatives. The study shows a new approach of open innovation at the level of health communities. A new concept of “Open Health Communities” is proposed, highlighting the potential for collaborative knowledge creation and transfer within health-focused community networks.

Methodologically, the study demonstrates novelty through the creation of an original semi-structured interview tool, tailored specifically to the research context. This methodological refinement enhances the depth and richness of the data collection, ensuring a comprehensive exploration of the research questions at hand.

Finally, in terms of empirical inquiry, this thesis stands out as one of the pioneering qualitative studies to examine the health communities and the mechanisms of knowledge transfer operating within them. Focusing the attention on this underexplored domain, the research extends scholarly discourse beyond the traditional boundaries of large organizations and business sectors, shedding light on the unique dynamics of knowledge management within the public health sector.

The practical significance of the research results that have been derived from this study holds implications for various stakeholders within the realm of health

communities. The original research instrument that was developed during this study offers practical using beyond the specific context of the research. The empirical findings generated through qualitative research offer explicit managerial and policy recommendations aimed at fostering open innovation implementation within the health communities. They provide actionable guidance for community leaders, policymakers, and healthcare professionals to promote a culture of innovation and collaboration within their respective communities.

Elucidating the key components and processes involved in effective knowledge transfer, the study offers practical guidance on how community members can share, co-create, and transfer knowledge to drive innovation collectively. The practical recommendations that have derived from the study can help to facilitate the collaboration by establishing communication channels, fostering trust, and promoting a culture of knowledge transfer within the health communities.

The research emphasizes the role of community members as active participants in the knowledge transfer process. The study empowers individuals within health communities to take ownership of their learning and contribute to the generation of innovative solutions to health challenges by providing them with the necessary tools, resources, and support.

Based on the empirical findings, the study offers explicit policy and managerial recommendations tailored to the context of open health communities. These recommendations aim to create an enabling environment for community-driven innovation by addressing barriers to knowledge transfer, promoting collaboration among stakeholders, and fostering a culture of openness and experimentation.

Structure

The thesis is organized into the following sections: the first chapter delves into the fundamental concepts of the research, including health communities, open innovation, and knowledge management (transfer). The second chapter outlines the research methodologies employed to investigate knowledge flows within health communities. The third chapter presents the analysis of the empirical research findings. The thesis concludes with a discussion of the research outcomes and final conclusions. The document is comprised of 214 pages in total and includes 19 figures, 13 tables, 285 references, and 3 appendices.

1. CONCEPTUALIZATION OF KNOWLEDGE TRANSFER IN OPEN HEALTH COMMUNITIES WITH REGARD TO OPEN INNOVATION: THEORETICAL ANALYSIS

This chapter serves as an analytical exploration of the fundamental theoretical concepts underlying the research, aiming to establish connections between them. To begin with, the key concepts that form the foundation of this study were described by definitions and findings in scientific literature, i.e., health community, open innovation, open health community, knowledge management, and knowledge transfer mechanisms, and carefully examined and defined based on the existing scientific literature. Through an extensive review of relevant research and scholarly works, these concepts are contextualized, and their significance within the research context is explained. A thorough investigation of the main concepts was conducted via a systematic literature review.

By sourcing the definitions and findings presented in the scientific literature, a comprehensive understanding of each concept is developed, providing a solid basis for subsequent analysis and investigation. Furthermore, the interrelationships among the core concepts are explored and examined to establish a theoretical framework. The finale of this chapter lies as a theoretical conceptual framework that serves as a synthesis of the core concepts that have been discussed. This chapter establishes a strong theoretical foundation by interlinking the key concepts and establishing their theoretical underpinnings, upon which the subsequent empirical investigation and analysis are built.

1.1. Conceptualization of Open Health Communities

Within the research domain, a diverse set of terms is used to describe different aspects of patient engagement and involvement in healthcare. These terms include but are not limited to: "community of practice", "patient collaboration", "active patient", "patient empowerment", and "patient participation" (Greenhalgh et al., 2011; Vallentin-Holbech et al., 2020). Each term has its own distinct set of meanings, reflecting the multifaceted nature of patient engagement within the healthcare context.

The use of these terms reflects the evolving comprehension and acknowledgment of the pivotal role that the patients assume in their own healthcare. The ideas, such as "community of practice", underscore the significance of nurturing collaborative learning and knowledge exchange among the patients (Lough & Toms, 2018; Garavan, Carbery, & Murphy, 2007; Li et al., 2009), while patient collaboration shows the significance of involving patients as active partners in decision-making processes (Vahdat et al., 2014; Carman & Workman, 2017; Veilleuz et al., 2018; McCarron et al., 2019). Additionally, the concepts of the active patient and patient empowerment emphasize the need to empower individuals to take an active role in managing their health and making well-informed choices (Castro et al., 2019; Pekonen et al., 2020).

When sourcing this varied terminology, it seems that researchers and healthcare professionals seek to capture the diverse dimensions and nuances of patient

engagement (Hamilton et al., 2017). These terms reflect the evolving perspectives and paradigms in healthcare, acknowledging the importance of patient-centred care and the recognition of patients as key stakeholders in the healthcare ecosystem.

In the field of managerial sciences, the term "health community" does not possess an acknowledged definition. It is marked that the distinctions exist between the understanding of "community health" and the concept of a "health community".

The traditional notion of "community health" primarily focuses on the overall health status and well-being of a particular community or population. It encompasses factors, such as disease prevalence, healthcare services, and environmental aspects that influence the health outcomes of the community as a whole (McKenzie & Pinger, 2012; Whelan et al., 2023; Nock et al., 2023). Typically, the public health workers or even community nurses are responsible for conducting screenings, implementing health promotion initiatives, and making decisions on behalf of the community members (Oliver et al., 2015; Pennel et al., 2015; Cherrington et al., 2010). However, the concept of a "health community" goes beyond the assessment of health indicators. It encompasses a more comprehensive understanding of the dynamic interactions and relationships among individuals, organizations, and stakeholders involved in promoting health and well-being. A health community emphasizes the active engagement, collaboration, and shared responsibilities of various actors within the healthcare ecosystem.

The differentiation between these terms highlights the evolving perspective on health management and the recognition of the importance of community participation and involvement in shaping health outcomes (Gilmore et al., 2020; Rifkin, 2014; Bath & Wakerman, 2012; Sacks et al., 2017). Thus, by acknowledging the concept of a health community, the researchers and practitioners aim to capture the broader dimensions of collective efforts, community engagement, and collaborative approaches to improve health and foster sustainable healthcare practices.

The concept of a health community is defined as a source of existing health knowledge aimed at supporting community members. In addressing health issues through the sharing of existing knowledge and the potential for co-creation and transfer of new knowledge, it seeks to enhance healthcare.

When analysing healthcare at multiple levels, it is possible to gain a comprehensive understanding of the interplay between individual behaviours, community structures, and broader systemic factors. The author of the dissertation delves into the complexity of health systems by examining the micro, mezzo, and macro levels. These levels provide a framework for understanding the various dimensions and actors involved in the delivery and management of healthcare services. Figure 1 provides an overview of different levels of healthcare organized by micro, mezzo, and macro levels.

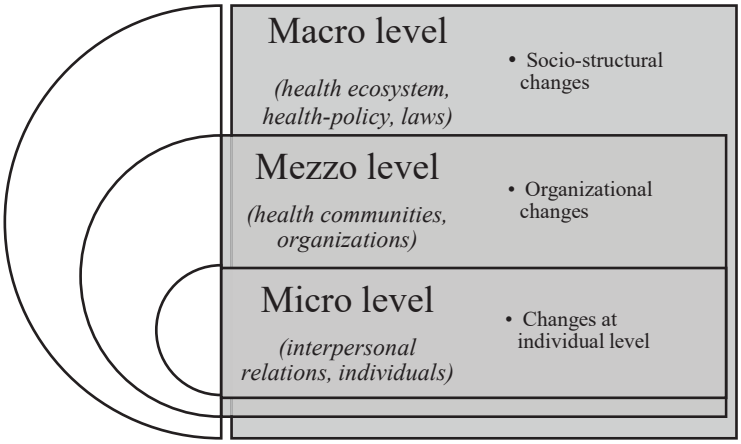


Figure 1. Different levels of the healthcare organizations (micro, mezzo, and macro)

At the macro level, there is a possibility to examine the broader societal and policy influences on the health systems. This level encompasses whole health ecosystems: government policies, healthcare regulations, funding mechanisms, and societal norms that shape the healthcare landscape (Sawatzky et al., 2021). Macro-level factors significantly impact the access to care, healthcare quality, and health outcomes at a population level. Usually, at macro level, there are unaddressed society requirements of the healthcare delivery (Sawatzky et al., 2021; Krawczyk et al., 2019). Understanding the macro-level dynamics, the healthcare leaders can develop evidence-based strategies to address systemic challenges and improve the health system performance.

At the mezzo level, the focus is shifted to the community and organizational structures within the health system. Mezzo-level factors include healthcare organizations, community health centres, and professional associations (Barasa et al., 2017; Waithaka et al., 2018). These entities provide critical support and infrastructure for the delivery of healthcare services. Health community, as mezzo level, promotes and builds capacity among health supporters (May, 2015). Examining the relationships and interactions between organizations and inside them helps to understand the distribution of resources, coordination of care, and collaborative efforts within the community (Lillrank et al., 2011). Mezzo-level analysis is crucial for identifying gaps in service delivery and optimizing healthcare delivery models (Waithaka et al., 2018). There is a need for a systematic model for knowledge transfer that includes various stakeholders, different flows and connections, and resolve of knowledge asymmetries at the community (mezzo) level.

The micro level is on individual healthcare behaviours and decisions. This includes examining the choices made by the patients, healthcare providers, and other stakeholders directly involved in the delivery and consumption of healthcare services (Sawatzky et al., 2021; Radaelli et al., 2014; Osei-Frimpong, Wilson, & Lemke, 2018). Factors, such as health beliefs, personal preferences, and socio- demographic

characteristics, significantly influence individual healthcare behaviours (Bærøe, 2008). Micro-level dynamics is essential for designing effective interventions and promoting positive health outcomes.

Knowledge management and integration for innovation at each level contains its own challenges and demonstrates a multidisciplinary nature that is proposed to combine through organizational knowledge management instruments. In order to address the complex phenomena of knowledge development, sharing, transfer, and absorption between health communities, a systematic theoretical model has been developed for knowledge integration that includes various stakeholders at the community (mezzo) level (see Figure 2).

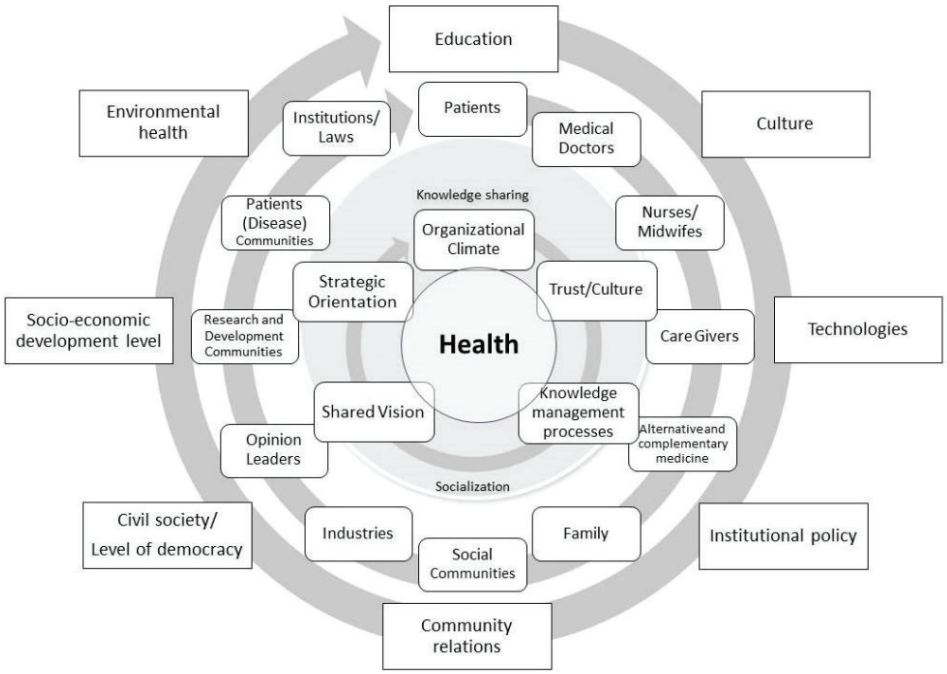


Figure 2. The main stakeholders of health communities (Petraitė, Užienė, and Maženytė, 2018)

The process of creating health knowledge is complex and involves the active participation of various communities and stakeholders (Haldane, 2019). Traditionally, health knowledge creation and management have been viewed as a combination of formal scientific sources, represented by the research and medical community (Kallinikos & Tempini, 2014; Fischer & Mandell, 2009; Thirup & Mikkelsen, 2000), and indigenous knowledge rooted in traditions, behavioural norms, and experiential knowledge within the community (Petraite et al., 2018).

The work of Paavola, Lipponen and Hakkarainen (2004) indicates the need of community building for successful knowledge creation: “knowledge work is not accomplished by epidemiological means alone, moreover, individuals are influenced

by their participation in cultural practices and their membership in knowledge communities. It is important to understand those cultural practices through which innovative knowledge communities' function".

The health community consists of diverse stakeholders who share common interests. These stakeholders encompass patients, doctors, healthcare professionals, nurses, family members, alternative medicine practitioners, social communities, opinion leaders, research and scientific communities, patient communities, research and scientific organizations, business organizations, and other institutions (Concannon et al., 2019; Lu et al., 2017; Panda & Mohapatra, 2021). The composition of these stakeholders is not fixed and may vary depending on the situation (Petraite et al., 2018). Different stakeholders may assume varying levels of prominence at different times, reflecting their respective importance in specific contexts. However, it is essential to recognize that no single stakeholder can operate in isolation from others to effectively achieve health improvement goals.

The knowledge management model emphasizes the significance of stakeholders while as well considering the contextual elements, such as culture, technological advancements, legal frameworks, democratic practices, environmental factors, and community relations in the process of effectively managing knowledge within health communities. Stakeholders not only interact with each other but as well operate within specific contexts shaped by various influencing factors.

1.1.1. Systematic Literature Review of Health Communities

One of the primary obstacles faced by the healthcare systems involves the transformation of tacit knowledge into explicit organizational knowledge, which plays a crucial role in driving innovation in healthcare services (Amann & Rubinelli, 2017). While the significance of patient participation is widely recognized, healthcare systems primarily are focused on gathering information about patients rather than engaging in collaborative knowledge generation (Amann & Rubinelli, 2017). Understanding the types of partnerships and the mechanisms through which participation can contribute to the development and utilization of created knowledge poses a significant challenge (Jull et al., 2017). The one of the phenomenological partnership for knowledge management is a health community.

Community members are motivated to exchange information and share their knowledge. Motivation usually depends on every member and could be motivatedfor different reasons, but member's engagement in the community serves as a motivational background. Community members usually are useful in the process of innovation because they are self-interested, contribute to the activity and work to meet the needs of the community (von Hippel, 2016). Community members became creators who co-create innovation and contribute to the value creation (Kohler & Chesbrough, 2019). Different solutions, platforms are available to the community and domain experts as problem solvers (Hill et al., 2017). People want to get health information fast (here-and-now) and from sources that can be trusted (Quintana et al., 2001; Petraite et al., 2018; Mazenyte & Petraite, 2019), where patients can find personalized information. Digital technology drives communities to sustain efforts for

developing collaboration that enables social, economic, and public value creation (Romanelli, 2018). Communities' empowerment and the management of an existing knowledge lets to fulfil the desired, positive-influencing knowledge flow (Tang, 2017). Health communities encounter various challenges, highlighting the significance of identifying and implementing appropriate knowledge management. The theoretical research additionally aims to conceptualize health communities and examine their various configurations and settings.

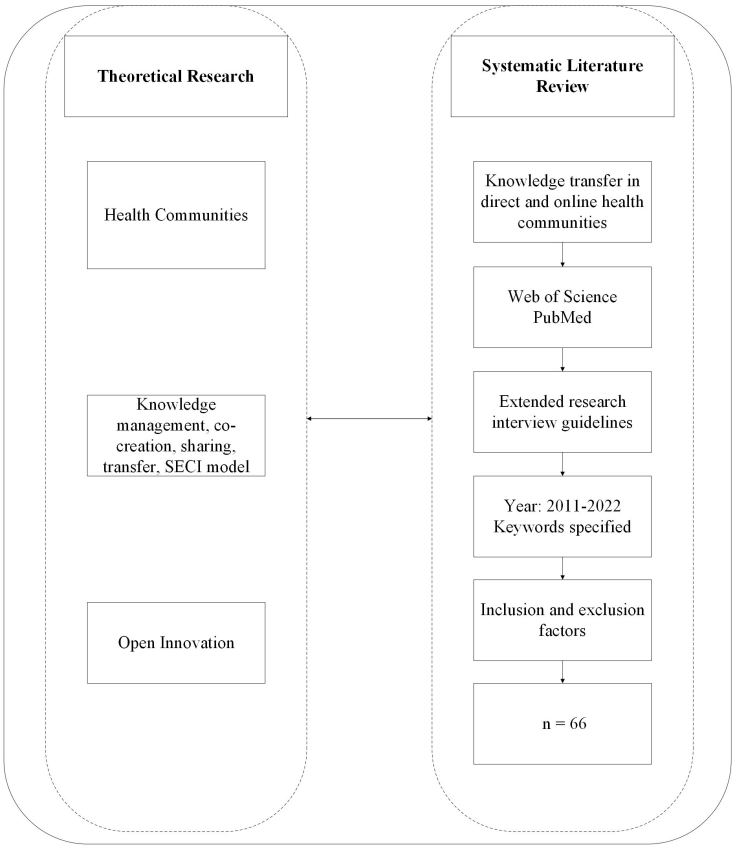


Figure 3. The developmental course of theoretical research

Health communities encounter numerous challenges, characterized by complexity and information asymmetries. The healthcare sector demonstrates disparities in its organizational structures, norms, regulatory frameworks, data protection protocols, attitudes towards intellectual property protection, and the intricate nature of innovation, all compounded by disparities in information accessibility and dissemination (Reinhardt et al., 2014). Leveraging complexity through knowledge transfer can facilitate the discovery of novel and innovative approaches to address health challenges. It allows for the exploration of diverse perspectives and the identification of appropriate tools to achieve desired outcomes.

The theoretical research of the thesis employs a systematic literature review methodology, using specific search terms, such as “knowledge management and health ecosystem”, “open innovation and health”, “knowledge co-creation and community”, and “knowledge transfer and open innovation”, to extract the most relevant papers. The frequency of research publications related to “open innovation in healthcare”, “health communities”, and “knowledge management in healthcare” has shown a consistent upward trend since 2011, indicating increasing interest in these topics each year (Figure 4). This time period (2011–2020) is deemed suitable for the search strategy. All identified research articles, published within the past decade (2011–2020), were subjected to the comprehensive analysis and categorized accordingly. The PubMed and Web of Science platforms were used to explore these research articles.

These articles have been selected due to their immediate relevance to the topics involving knowledge management in health ecosystems, the implementation of open innovation within healthcare, the collaborative generation of knowledge within communities, and the knowledge transfer within the context of open innovation.

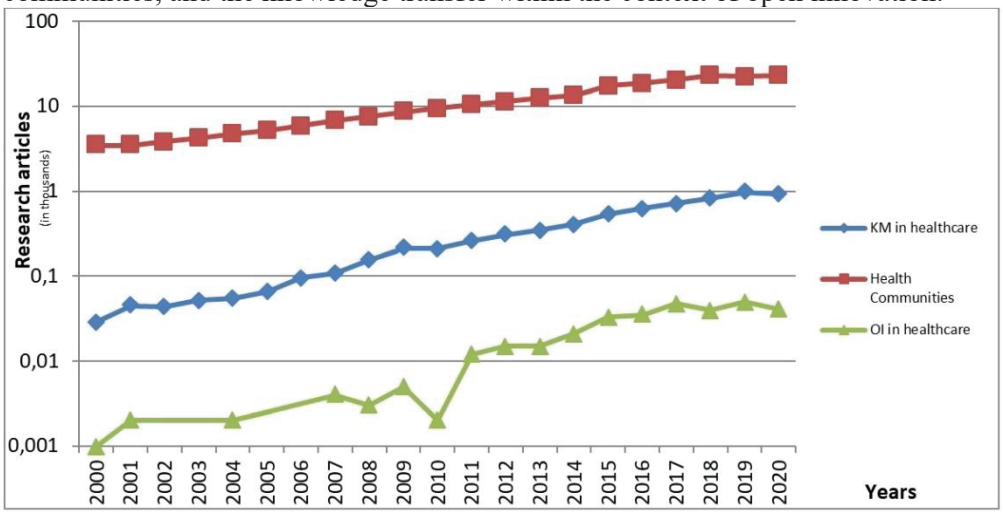


Figure 4. Yearly frequency dynamics in scholarly publications (WoS analysis)

The initial step in the search process involved the selecting of topic of knowledge management in the health communities. The open innovation (OI) approach was chosen as a contextual framework for investigating knowledge transfer processes. The pairs of keywords, namely “knowledge management and health ecosystem”, “open innovation and health”, “knowledge co-creation and community”, and “knowledge transfer and open innovation” were used.

Firstly, systematic literature review started with a search of relevant papers. In total, 626 papers in PubMed and 2,822 papers in Web of Science that were relevant to the selected keywords were found. Further refinement of the search within the ten-year period from 2011 to 2020 revealed 551 papers in PubMed and 2,337 papers in Web of Science pertaining to the research topic. The articles written in languages other

than English were excluded from the search results, resulting in a total of 543 articles from PubMed and 2,269 articles from Web of Science. Additionally, the articles that did not align with the research areas or were published in journals with low impact factors (IF less than 1) were excluded as well (Figure 5).

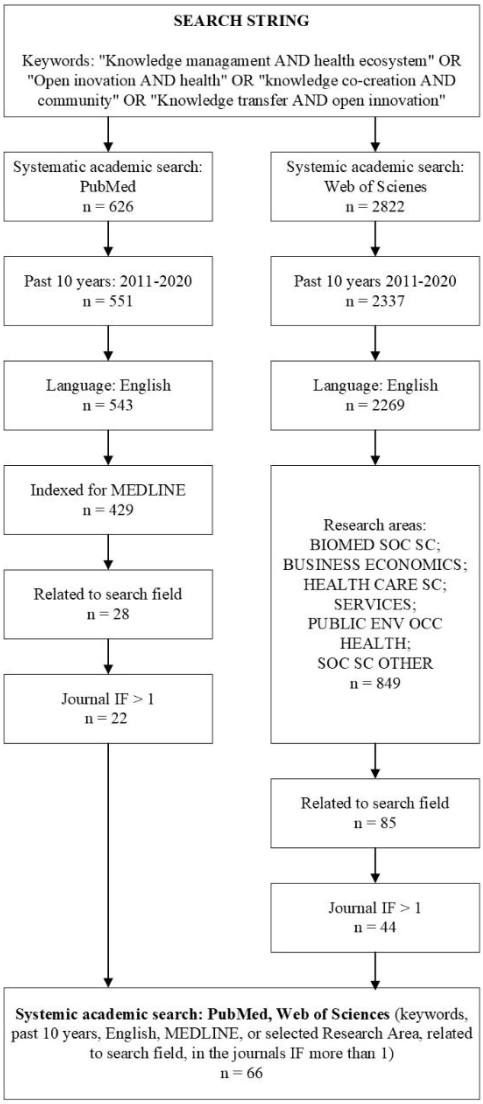


Figure 5. Searching framework of conceptual literature review

After the exclusion criteria were applied, a final set of 66 articles remained for the conceptual literature review, comprising 22 articles from PubMed and 44 articles from Web of Science (Figure 5). These 66 articles were subjected to a detailed analysis, including examination of the title, authors, keywords, etc. (Appendix 2).

The selected research articles underwent a comprehensive review, and topic modelling was employed to identify their primary subject areas. Initial categorization

was carried out based on the subject matter of each article. The individual categories encompassed a wide range of topics, including disease management, digital health, ecosystems, community empowerment, precision medicine, software development, diffusion of innovation, drug management, open innovation, patient empowerment, maternal health, health platforms, community management, online communities, co-creation, know-do, entrepreneurship, community health, health systems, health services, environmental health, business-model transformation, public health, patient-centred care, health literacy, value creation, collaboration, society, and others. Subsequently, the first-order categories were re-evaluated to create more generalized subject areas. Eight second-order categories were formed, namely knowledge management, knowledge translation, open innovation, innovation, health management, health ecosystems, co-creation, and value creation.

Further discussions were conducted on the second-order categories, leading to the identification of two prominent third-order categories that commonly appeared in the articles, i.e., knowledge transfer and health community (Figure 6). Direct or indirect matches that aligned with these categories were identified. For example, an article by Secundo et al. (2019), which discussed health ecosystems, was assigned to the category of health community to facilitate the adaptation of relevant theories, methods, or approaches for the research. As a result of the conceptual literature review process, two third-order categories emerged, i.e., "knowledge transfer" and "health community". It was observed that the category of "open innovation" intersected with both of these third-order categories. Subsequently, the articles falling within the scope of these third-order categories were subjected to further analysis.

Through this analysis, the main components of knowledge transfer and the main types of health communities were identified and deduced. Health communities were categorized into different types, including online health communities and direct health communities.

As the understanding of health communities evolves, it becomes increasingly vital for researchers, business and policy-makers to engage in interdisciplinary discussions and collaborative efforts. After synthesizing insights from various domains, it is possible to work towards a comprehensive and shared understanding of health communities. Such collective efforts are fundamental to designing knowledge transfer models that align with the specific needs and dynamics of health communities, ultimately contributing to improved healthcare practices, patient outcomes, and community well-being.

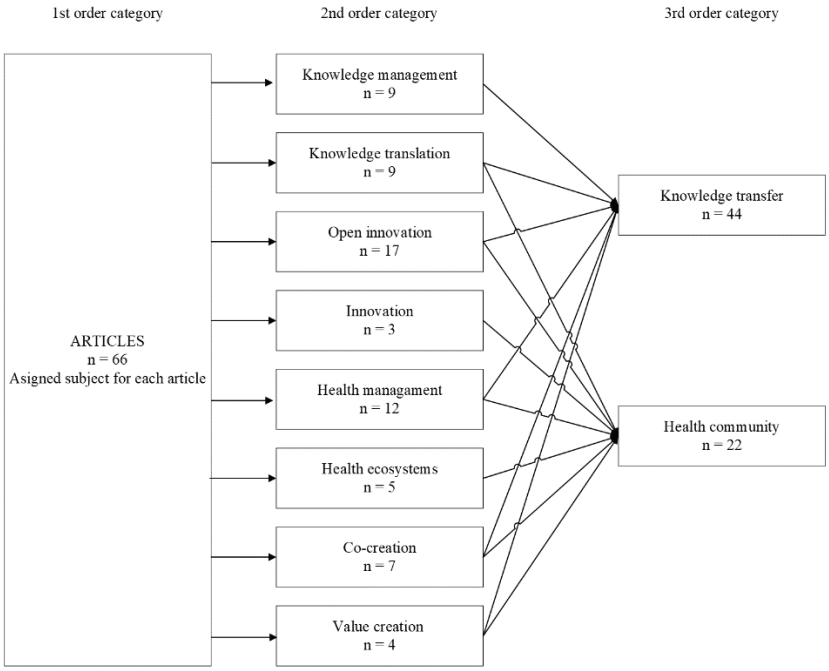


Figure 6. Categorical analysis of conceptual literature review results

From the 3rd order category of "health community", the articles were selected for further analysis focusing on the main types of health communities. The literature distinguishes between two primary types of health communities, i.e., 1) direct (face-to-face) health communities (DHCs) and 2) online health communities (OHCs). Articles that provided a definition of either type of community were included in the in-depth analysis, resulting in a total of 22 articles (see Table 1).

In this scientific research, the exploration of typology of health communities highlighted two distinct classifications, i.e., direct health communities and online health communities. Through an extensive review of the existing literature, the unique features and functions of each were established. DHCs encompass physical gatherings where individuals come together in person to share experiences, information, and support related to the health matters. Conversely, OHCs represent virtual platforms where individuals connect digitally to engage in similar exchanges, fostering a sense of community despite physical separation.

The precision and relevance were ensured in the investigation by employing a selection criterion focused on the articles on the defining characteristics of each type of community. However, in order to gain a comprehensive understanding of the intricacies within these typologies, further exploration is needed. In the subsequent section, there will be seen the nuances of typology, examining their advantages, challenges, and impacts on the health outcomes. The aim of this analysis is to provide a comprehensive framework for understanding and leveraging the diverse landscape of health communities in the modern interconnected world.

Table 1. Analysis of "health community" factor display

Reference	Display of Health Community	Direct	Online
Tana et al., 2012	"Bottom-up deployment through active involvement of the community will have a lasting effect if the existing structures are strengthened and supported (in the case of our study area community leaders, community volunteers and community assemblies called community forums) then the community will be enabled to decide by themselves the type of intervention they prefer and the role they assign to facilitators (in our case the research team)." "In our study five indicators for assessing community participation in health programs (Draper et al., 2010) were applied in a descriptive way: leadership of the community and of other stakeholders when introducing the intervention; planning and managing partnerships between the community and professionals; women's involvement; gaining financial independence and 'grip' on further intervention design; monitoring and evaluation by the community; examining how intended beneficiaries are involved in programmed activities. **The effect of a participatory intervention package was assessed using as outcome variables: financial independence, increased community participation, better knowledge and improved practices**."	√	
Cori et al., 2019	"The concurrent developments of social media and scientific citizenship contributed changes in legislation and culture, modifying the role of stakeholders in the communication arena. **The growth of social media use in fact induced a disintermediation, a never experienced exchange of information among stakeholders and a profound modification in roles and relationships among social actors.** Citizens Science encompasses a number of different practices of lay people's involvement in science, sometimes contributing to formal research, providing new data or developing independent activities; a key feature lays in assuming the responsibility to expand knowledge, to understand scientific language, to enter in the scientific discourse and to be able to use scientific results for decision making. "The support of **public participation and mutual listening** are natural consequences of the application of the above principles, understood as a promotion of knowledge, competencies and ability to make decisions based on scientific results, regarding the person and the community at large. This implies the involvement of various social sectors and age groups in the different phases of the project; civil servants and public administrators deserve special attention, as well as general practitioners and teachers, as the results of scientific activities should be used in promoting protection and prevention activities."	√	√
Menear et al., 2019	"Another transformative feature of learning health system (LHSs) is their emphasis on patient and community engagement, which can take many forms, as demonstrated in large-scale initiatives such as PCORnet® in the United States (https://pcornet.org) and the Canadian Institutes of Health Research's signature SPOR (Strategy for Patient-Oriented Research) initiative in Canada. Networks and learning communities that foster trusting relations between diverse stakeholders can nurture cultures in which learning and improvement is ingrained within their normal operations, though fully realising such culture shifts is considered one of the most challenging tasks of LHS implementation." "**Hardware and software supporting the use of algorithms, machine learning, data mining and advances in artificial intelligence also offer unmistakable potential to identify new problems, examine trends in care, test solutions, and ultimately accelerate learning and innovation**." "Participatory, user-centred design approaches can be used to help design data systems and processes that are less disruptive and more user-friendly and responsive to the needs of all LHS members." "Indeed, from a patient's perspective, perceptions of value will often depend less on their experiences with a single intervention or provider but rather on an accumulation of experiences as they journey through multiple contacts with the health system. Poor continuity or integration of care along this journey reduces value through negative impacts on both individual care experiences and population health."		√
Floch et al., 2018	"**Health management through apps** may be particularly beneficial for persons with chronic conditions who often require daily care and sustained self-management. In fact, different reviews have observed a positive effect of the use of information and communication technology (ICT) for facilitating self-management of chronic diseases." "This also implies that the patient accurately reports activities and symptoms and actively complies with the treatment routines by changing behavior in line with changing health needs. The health care professionals (HCP) has a crucial role in determining individual treatment routines together with the patient. HCPs can support the patients' self-management behavior between consultations, for example, by providing them with the necessary knowledge. Collaborative roles of patients and HCPs are discussed in more detail in other studies." "They found that persons with a smartphone would have **the app to help them manage the disease**. The study identified a list of preferred features for such an app. This list of features included, but was not limited to, access to health information, communication with other people with CF, communication with health providers, automation of the process to order medication, and tracking and visualizing health behavior." **"An important finding is the need for personalization, stemming from the individuality of the patients, from the level of experience with the disease and treatment, and the changes in life." "One size does not fit all" in the case of CF self-management."**		√
Rivière-Cinnamond et al., 2018	"Understanding the social component associated with plague in endemic areas **is crucial to comprehend human interaction with its surrounding ecosystem and how it may contribute to diseases emergence** [29, 30]." "The more convoluted scenario depicted by the stakeholders' group shows, that inconsistencies between perceived causes and suggested solutions, might be associated to lack of communication and collaboration across stakeholders' categories and sectors of action. **The relation between the stakeholders' group and the different sectors that were mentioned as needed in problem-solving** — particularly the sugarcane production company — but that were not present in the response might need to be further examined."	√	
Hsieh et al., 2015	"More importantly, finding the relationships between mangrove services and human welfare can assist stakeholders in the formulation of sustainable action plans that support mangrove ecosystems. Previous studies have addressed mangrove ecosystems' natural drivers, functions, services, monetary valuations, ecological restoration, and management and adaptation strategies in response to threats from climate changes. Framework development procedures and a simplified network, with respect to the linkages between	√	

	ecosystem functions, ecosystem services, and community's wellbeing ..." "Community and social cohesion in the Good Social Relations category also depends heavily on mangrove services. This wellbeing attribute refers to the relationships and working links between groups, cultures and communities. **This basic need is satisfied when an individual feels belonging to a larger, friendly, supportive group with people who show mutual respect**."		
Pohjola et al., 2013	**"The need to span the whole chain from knowledge creation to outcomes and bringing the producers and users of knowledge to a more intimate interaction for solving practical problems is recognized in some new approaches to assessment, modeling and their evaluation and management**. The new approaches can be seen attempts to address the challenges of societal decision making which the more conventional approaches have not succeeded to resolve. **Most significantly the new approaches are different in the sense that they consider knowledge and knowledge-based action as their output, and software and information as means for their delivery.** The pragmatic and socio-technical approaches also draw the attention to the practices of the collectives involving in intentional creation and use of knowledge in networks consisting of human actors and non-human objects (e.g., tools, models, information) mediating their interaction. Perceiving assessments and models interacting with their contexts as socio-material entities also promotes a multi-perspective approach to their evaluation."	√	√
Blanchet, 2012	"Focusing on flows of information between a health system's actors can help improve understanding of the pressures and constraints faced by stakeholders (Brinkerhoff, 2004) and of the factors influencing local actors' decisions (Walker et al., 2004)." "Health systems are characterized by strong asymmetries in the flow of information between actors." "The change of the network over time also showed the influence of a strong broker in a network on generating links and creating connections between actors from different levels. In conclusion, managing health systems requires understanding who the actors are, the relationships between these actors and how the social network of actors is structured."	-	-
Goater, 2011	"Although climatic drivers of coral reef disturbance are beyond our immediate control, their impact on public health could be minimized if an adaptive governance strategy were established to support health policy making, regulation, and coral reef and fish stock management. **Health information systems (HIS) in the Pacific are designed to inform policy and public health intervention; however, their performance is being challenged by emerging problems such as environmental change (Goater et al., 2011)."** "Outbreak data may be collected by disease control units rather than health service providers and may not then be incorporated into the HIS" (Chiller et al., 2005; Finau 1994).		√
Dandonoli, 2013	"A social enterprise such as the Maker Hub, which is built around community engagement and user-centered solutions, offers the potential to tap into this knowledge. Social enterprises in developing countries tend to be entrepreneurial and nimble, which can enliven a large, established research and development program. Dormant intellectual property inside the developed country, private sector partner, when licensed to developing country partner, becomes a new revenue stream. Developed country partners, whether for- or not-for-profit, can serve as a kind of 'incubator' and 'accelerator' for the developing country partner by providing access to sources of capital, both philanthropic and investment, and to knowledge and expertise (e.g., legal, technical, management, financial) in launching and growing a successful organization." "Rather than developing and then adapting, stripping down, or retrofitting innovations for markets in one setting or the other, this approach effectively co-creates innovation, puts communities and clients at the center of the design process, and aims to create economic and social value for all partners on a more equal footing from the outset. Though only one example, this approach suggests that social innovation can move more fluidly and structurally between developed and developing countries and become embedded in a truly global innovation process."	√	
Shaikh and Levina, 2019	"Today, companies and especially technology firms are increasingly embracing open innovation communities as part of their innovation strategy (Dahlander, 2007; Greenstein and Nagle, 2014; Dahlander and Gann 2010), and the decision of which communities to partner with is becoming more frequent." "Open source communities are a subtype of open innovation communities that have a historical track record of over twenty years (von Hippel, 2001; von Hippel, 2005). Moreover, organizations tend to choose open source communities, often irrespective of which technological platform they are hosted on, whereas for the for newer forms of open innovation communities, such as those that produce art works or solve scientific problems, the choice of platform provider that 'hosts' the community, often precedes the choice of the community itself." "The blurring of the boundaries between internal and external work, as well as between innovation processes and innovation outcomes, that is associated with digital innovation (Nambisan et al., 2017) makes it particularly difficult to make such evaluations. Moreover, the openness of participation and anonymity and fluidity of participants, which often characterizes **digitally-enabled innovation communities** (Faraj et al., 2011), causes great difficulty when it comes to applying the traditional criteria of trustworthiness and competence in choosing an alliance partner. Finally, digitally-enabled open communities are constantly evolving (Gulati et al., 2012) which makes partnering with them a moving target and necessitates a great degree of flexibility in adjusting organizational goals in such partnerships."		√
Hannemann-Weber et al., 2011	"The extent of shared goals within the health care teams has a **direct effect on patients'** idea generation. Work adaptivity and proactivity and shared goals both reinforce the positive effect of service orientation." "The study underlines (1) **the important role of patients** within health care service innovation processes, (2) the necessity of a service-oriented working climate to foster the development of innovative care solutions for rare diseases, and (3) the **need for an efficient cooperation** and open mindset of health care professionals to motivate and support patient innovation."	√	
Haynes et al., 2019	"**Community-based participatory** action research (CBPAR), based in social justice principles of self-determination (Campbell, Wunungmurra, & Nyomba, 2007) and empowerment, provides an opportunity for genuine partnering between community and academia (Wright & O'Connell, 2015). In this context community empowerment2 results from strengths-based approaches that focus on activating existing power, developing abilities and critical thinking skills in order to facilitate action for change and a greater sense of control. Empowered communities 'express their needs, present their concerns, devise strategies and make decisions to achieve political, social and cultural action to meet those needs' (Nutbeam, 1998: 354)."	√	
Amann and Rubinelli, 2017	"**Online health communities (OHCs)** are an increasingly popular source of health information and peer-to-peer support, particularly for patients with chronic health conditions. They enable individuals to connect and exchange their experiences with symptoms, treatments, side effects, and strategies for self-management. By publicly sharing their experiential expertise and health advice, individuals can provide important support to others in need." "By enabling patients to actively participate in the health care discourse online, OHCs can, in turn, also foster collaboration and knowledge co-creation between patients, researchers, health care professionals, and businesses, allowing for a multilateral exchange of knowledge and ideas to create new knowledge." "Here, we argue that community managers, as well as other core members who actively contribute to online communities, are likely to possess lead user attributes, making them an important resource of innovative ideas for health care organizations and researchers. We thus believe that existing online communities can help researcher and practitioners not only to identify lead users but that they can also serve as a platform to foster knowledge co-creation between patients, health care professionals, researchers, and businesses. Ultimately, knowledge co-creation will help to inform the development of products, services, and research activities that better meet the needs of those living with a disability."		√

Kitson et al., 2013	"**A public health approach would place emphasis on the formalized social, community** or organizational activities to maintain, promote or improve health that might also pertain to groups outside our defined population." "In engaged scholarship, researchers and communities, including communities of practice [57] co-create knowledge with a view to improvement of processes and outcomes. The different skills, knowledge and capabilities that researchers and practitioners bring when addressing complex issues as a collaborative venture outweigh either party undertaking the project alone. This is equally applicable to regular community members." "The research activity becomes more of a commitment to an ongoing relationship where researchers and the community are partners in problem-solving and knowledge generation pursuits." "It is argued that involving community stakeholders in the problem identification and knowledge creation steps will facilitate better understanding and acceptance of the interventions that are developed 'in context' to improve services."	√	
Tomaselli et al., 2020	"**In person-centered care, the patient shifts from a passive role to an active role and utilizes his/her capabilities and resources.** The foundations of this approach can be retrieved back to Hippocrates time and, more recently, Osler who emphasized the importance of patient-provider relationship and listening to patients' history in order to identify most suitable treatment plans. This strong relationship between patients and health providers is required not only to agree on treatments, services and care delivery but also to incorporate and document the person's needs (health, social, psychological, work, family, society), expectations and wishes. In so doing, it is envisaged that quality of care will be higher, and costs will be better contained. All is to be based on patients' characteristics, needs, and expectations (7)." "This distinction enables us to explain the paradigm shift from 'patient-centered' to 'person-centered' care. The healthcare provider partnership and co-creation of the healthcare plan contributes to the delivery of high quality, safe and cost-contained healthcare."	√	
Vallentin-Holbech et al., 2020	"One way to assess genuine participation by the children and adolescents in the development of health promotion interventions is using Shier's model 'Pathways to Participation', which describes five levels in relation to young peoples' participation, namely that they are listened to (1), they are supported in expressing their ideas (2), their views are taken into account (3), they are involved in decision-making responsibilities (4), and they share power and responsibility for decision-making (5). Findings from this study's interviews indicate a high level of participation of students (level 4 and level 5). Students experienced openness and opportunity from researchers, experts and practitioners to share power and responsibility for the decisions and choices related to the film characters and the development of the mini-games as new features of the end product. In addition, the joint problem solving among all stakeholders in the development group motivated the students to engage in the co-creation process [19]. From the student statements, it is evident that the students expected power asymmetry in the beginning. However, during the process they experienced more symmetry in power and decision-making as a result of their suggestions being acknowledged and accepted by the wider team." "This study adds to the evidence on benefits for participants involved in the co-creation process. In line with previous studies [15, 20], we found that using **the Living Lab methodology increased the participants' engagement, empowerment and self-efficacy.** In addition, the Living Lab methodology enabled the co-creation and research to be conducted in an efficient manner without neglecting the involvement of and contributions from stakeholders. The results indicate that the co-creation process provided participating students with feelings of being capable and optimistic about their future capacities (empowered), interested and ready to collaborate (engaged), and listened to and accepted (understood). The importance of ensuring a feedback loop to communicate project outcomes with all Living Lab participants is indicated."	√	
Priharsari et al., 2020	"Our results show that individual factors (motivation, personal attributes and participants' evaluation of the online community) are critical because they can act as enablers or constraints. In the online world, power shifts from the firm to individuals as information about products and companies become more transparent (Sinclaire and Vogus, 2011). This emphasises the active and equal roles of participants in the context of online co-creation communities (Abedin and Babar, 2018). Therefore, the sponsoring firm as a facilitator should understand their participants' characteristics and take action to maintain enablers based on these characteristics. One tactic for gaining a good understanding of the participants is by allowing participants to interact and co-create value in the online community (Brodie et al., 2013; Gebauer et al., 2013)." "Our proposed value co-creation model provides a rich picture of **value creation in online co-creation communities** and facilitates continued enquiry into online community practices." "Our proposed model highlights the importance of supporting value facilitation between participants."		√
King et al., 2019	"Fyrberg and Jüriado (2009) point out that the quality of interactions between the participants of a service network is essential to service co-creation, calling upon additional research on the interaction processes of network participants, as well as their co-creation of value. Ballantyne and Varey (2006) highlight **the role of a network during co-creation of value, through which mutual trust, learning, and adaptation of network participants start to take shape.** The interaction and collaboration among these network participants encompass two essential components: the co-creation of value and the integration of resources by the network participants (Vargo and Lusch, 2008). Jaakkola et al. (2015) reviewed prior studies on co-creation and summarized that they have shifted from their initial focus on customer-provider relationships (e.g. Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2008) to the inclusion of co-creation between customers (Cova and Dalli, 2009; Schau et al., 2009) and networks of participants of various types (Edvardsson et al., 2011; Jaakkola and Alexander, 2014; Lusch et al., 2010)." "In various service contexts, co-creation demands transparency, openness and a smooth flow of communication among multiple participants for the system to function. This is increasingly important as Chalmers Thomas et al. (2012, p. 1011) reveal that in reality, communities (eco-systems) 'are an interconnected network of heterogeneous actors whose experiences are shaped by the interplay between actors and informed by market place dynamics" and that such heterogeneity is "destabilizing and a source of tension.' In the context of service experience eco-systems, therefore, to support co-creation, system participants need to identify with each other both collectively (with a common cause) and relationally (Jarvenpaa and Tuunainen, 2013)".	√	
Jull, Giles and Graham, 2017	"One approach to bridging the know-do gap is to implement an interactive process of knowledge exchange between health researchers and knowledge users [8]**. We refer to knowledge users here as individuals directly affected by research and inclusive of those who occupy a range of positions in health systems: funders, health system and policy decision-makers, health care providers, patients, and family members**." "KT includes the tailoring of knowledge for use within specific contexts, and its use supports the development of evidence-based decisions. The primary purpose of KT is to bridge the know-do gap, ensuring that research is used by knowledge users such as government decision-makers and community service providers to improve health delivery systems and health outcomes. That said, the conceptualization of the know-do gap as merely being the result of a knowledge transfer problem has been challenged. Current thinking has seen a shift to consider knowledge production as creating — or contributing — to the know-do gap. As a result, integrated knowledge translation (IKT) has been proposed as an approach to address the problematic issues with the generation of knowledge inherent in traditional research methods and knowledge production. Similarly, those who employ community-based participatory research (CBPR) have emphasized the importance of creating partnerships with the people for whom the research is ultimately meant to benefit. These research approaches engage researchers in partnerships with knowledge users and may be used to challenge assumptions about for whom, how, and what is defined as knowledge."	√	

Greenhalgh et al., 2016	"We consider the extent to which co-creation models linking university academics with health services in their local community might help solve the well-described issue of 'ivory tower' research that (for whatever reason) is not implemented, leading to waste1 and an entrenchment of the 'two cultures' problem – that is, of researchers and research users failing to understand or engage with one another. To put that question another way, we address the hypothesis that because of its emphasis on civic engagement, intersectoral collaboration, power sharing, and ongoing conflict resolution, co-created research might have particularly strong and enduring impact on health and wider outcomes in the local or regional setting in which universities are located." "**Community-based participatory research** (CBPR), which originated in the development studies literature, defines its goals in terms of human welfare and emphasizes equity and social justice: 'Community-based participatory research is an orientation to research that emphasizes 'equitable' engagement of partners throughout the research process, from problem definition, through data collection and analysis, to dissemination and use of findings to help effect change.' A closely related approach described by Dostilio44 and cited in the higher education literature is titled 'democratically engaged partnerships' and emphasizes power sharing, reciprocity, and mutual learning between a university research group and a local community partner."	√	
Osborne, Radnor and Strokosch, 2016	"In this paper, we define co-production as the voluntary or involuntary involvement **of public service users in any of the design**, management, delivery and/or evaluation of public services." "The co-creation of social capital in an individual and/or community through co-production that co-creates capacity to resolve problems in the future – such as developing the skills and/or confidence of individuals with disabilities or local communities … and that enables them to address and resolve other issues in the future."	√	√

1.1.2. Typology of Health Communities

It is known from the previously presented systematic literature review that health communities can be categorized into different types, including online health communities and direct health communities. Online health communities have become increasingly popular as valuable sources of health information and peer support, especially among individuals dealing with chronic health conditions (Magnezi et al., 2015). However, direct health communities involve face-to-face collaboration between users and providers with a focus on co-designing products or services and emphasizing the aesthetics of the service (Robert et al., 2015). After the literature analysis, the key indicators of different types of health communities were identified (refer to Table 2 for further details).

Table 2. Comparison of key indicators in direct and online health communities

Indicator	Direct (face-to-face)	Online
Place	Physical space	Virtual space
Time	Inconvenient place or time scheduling	Flexible timing for connection
Sharing	Direct contacts	Public sharing/facilitating collaboration
Data	Patient safety and healthcare quality	Ethics and data protection concerns
Personal input	Active patient decision in the treatment process	Sharing personal experiences, treatment plans, and self-management strategies
Group	Small, usually coordinated groups	Large, usually uncoordinated groups
Information	Very narrow topics	Information overload
Identification	Very personal sharing leads to lack of self-confidence and trust	Possibility to share anonymously
Roles	Aims for every actor	No clear role of actors
Goal	Clear goals	Lack of a defined goal
Challenges	Challenges in decision making	User conflicts or tensions/conflicts related to personal values
Motivation	Societal focus/activities	Personal focus/activities
Spreading	In-between sharing	Multilateral knowledge and idea exchange
Authors	Levinson et al., 2005; Greenhalgh et al., 2011; Longtin, 2010; Bergerum et al., 2019; Robert et al., 2015.	Amann and Rubinelli, 2017; Amann, 2017; Magnezi et al., 2014; Collineau and Paris, 2010; Josefsson, 2005; Hilliard et al., 2015; Maloney-Krichmar and Preece, 2005; Bullinger et al., 2012.

Direct health communities, as well known as face-to-face health communities, are involved in-person interactions and collaborations between users and healthcare providers (Smolinski et al., 2017). These communities are centred around creating a physical environment where individuals can interact directly with healthcare professionals and actively engage in the creation and improvement of products or services related to their health (Petiwala et al., 2021). In direct health communities, users and providers collaborate to exchange ideas, co-create solutions, and address specific healthcare needs or challenges (Landers et al., 2020). This collaborative approach enables a more individualized and customized approach to healthcare, as users can directly communicate their preferences, concerns, and objectives to the healthcare providers (Mays, Mamaril, & Timsina, 2016). The focus extends beyond the provision of healthcare services to encompass the aesthetics and user experience associated with these services.

These communities may take various forms, such as workshops, focus groups, or design sessions, where users and providers work together to explore innovative approaches, develop prototypes, or improve the existing healthcare services (Martínez-Cañas et al., 2016; Greenhalgh et al., 2011). The work conducted by Prahalad and Ramaswamy holds significant relevance from the managerial perspective, as their research on co-creation encompasses a comprehensive perspective. Their analysis of the transition and evolution of customers from passive observers to active participants resonates strongly with the concept of value co-creation. Notably, they highlight the emergence of a paradigm for value generation, where value is rooted in personalized experiences (Prahalad & Ramaswamy, 2004). The active involvement of users in the co-creation process helps to ensure that the services meet their specific needs, preferences, and expectations.

Direct health communities can be particularly beneficial in areas such as healthcare design, patient-centred care, and improving the overall patient experience (Petiwala et al., 2021). These communities promote a sense of ownership, empowerment, and shared responsibility in healthcare delivery by involving users directly in the decision-making process (Brownson, Gurney, & Land, 1999; Meagher-Stewart et al., 2012).

It is important to recognize that direct health communities may operate within specific contexts, such as healthcare institutions, community centres, or research settings. The success of these communities relies on the effective communication, collaboration, and the establishment of a supportive and inclusive environment that encourages active participation from both users and providers.

Online health communities encompass virtual platforms or digital spaces where individuals who share similar health concerns or interests convene to exchange information, seek support, and participate in discussions related to their health (Johnston et al., 2013). These communities are facilitated by various online platforms, such as websites, forums, social media groups, or mobile applications, that allow members to connect and interact with one another (Atanasova, Kamin, & Petrič, 2018).

Online health communities have gained increasing popularity because of their accessibility, convenience, and the abundance of information and support that they provide (Nambisan, 2011; Wentzer & Bygholm, 2013). They offer a platform for individuals to share their personal experiences, exchange information, pose questions, and seek advice from peers who may be encountering similar health-related challenges (van Uden-Kraan et al., 2009; Atanasova, Kamin, & Petrič, 2018; Lin & Kishore, 2021). These communities encompass a wide array of health-related topics, ranging from specific medical conditions to general well-being, mental health, lifestyle adjustments, and caregiving (Johnston et al., 2013; Nambisan, 2011).

The members can find emotional support, practical tips, and encouragement from others who understand their experiences within the online health communities (Petiwala et al., 2021). They can as well access the resources, such as articles, videos, and expert advice shared within the community. Additionally, online health communities may provide a sense of empowerment and a platform for individuals to become actively involved in managing their own health (Atanasova, Kamin, & Petrič, 2018).

It is crucial to emphasize that while online health communities can provide valuable support and information, individuals should exercise discretion and critically assess the information shared within these communities. Seeking personalized advice and guidance from healthcare professionals for specific health concerns is always advisable (Atanasova et al., 2017). The importance of online health communities has been on the rise and has garnered increased attention in recent years. However, it is worth noting that current research often overlooks the fact that online health communities serve as innovative platforms for communication and interaction between patients, caregivers, and healthcare professionals (Vennik et al., 2014; Atanasova, Kamin, & Petrič, 2018).

Due to the conducted case study, it became evident that the typology of health communities can be expanded to encompass three distinct groups: direct (face-to-face), online, and a mixed type. The mixed type of health community combines elements of both direct and online communities within a structure, incorporating features from each type. For instance, a health community initially categorized as a direct (face-to-face) community may hold regular in-person meetings and engage in co-creation activities while as well using online platforms for live seminars, virtual meetings, and online chats or groups to facilitate the collaboration through the Internet. The author of the dissertation believes that in the modern context, most direct health communities naturally evolve into mixed health communities, although empirical evidence supporting this typology is currently unreachable.

Addressing the complex issue of defining health communities and designing an appropriate model for knowledge transfer within them is in high demand. While the definition of online health communities is often employed to describe knowledge collaboration and transfer, it is worth noting that the context of open innovation within health communities remains underexplored in the existing literature (Secundo et al., 2019; West and Lakhani, 2008; Dahlander et al., 2008).

It is as well noted that there is an increasing demand for efficient knowledge transfer within communities and a deeper exploration of knowledge boundaries. Knowledge management mechanisms can assist users or participants in these communities in achieving open innovation (Secundo et al., 2019; Randhawa et al., 2017). While some literature discusses the primary dimensions, outlines the roles and relationships among the involved parties, and delves into the objects and mechanisms of knowledge transfer (Battistella et al., 2016; Secundo et al., 2019), the current understanding of the key distinctions and challenges within the healthcare system remains limited. This gap underscores the need for a thorough discussion and the development of knowledge transfer models from an open innovation perspective. It is essential to address this gap by conducting comprehensive explorations and in-depth analyses with the aim of proposing well-tested, adapted, and valuable models. The concept of online health communities (OHCs) has been utilized to describe knowledge collaboration and transfer (Faraj et al., 2011). However, it has been observed that the application of open innovation (OI) within the context of health communities is still lacking (Secundo et al., 2019; West & Lakhani, 2008; Dahlander et al., 2008). There is a growing recognition of the need for effective knowledge transfer within communities and the investigation of the knowledge boundaries. Open innovation mechanisms can assist users or actors within communities in achieving successful knowledge transfer (Secundo et al., 2019; Randhawa et al., 2017). Some literature proposes the key dimensions of knowledge transfer in open innovation, describes the roles and relationships between the involved actors, and discusses the objects and mechanisms of knowledge transfer (Battistella et al., 2016; Secundo et al., 2019). However, there remains a lack of understanding regarding the main differences and challenges within the healthcare system. This highlights a gap that necessitates discussions on the sensitivity of the topic and the proposal of knowledge transfer model from an open innovation perspective in healthcare. It is crucial to focus on exploring this identified gap and conduct an in-depth analysis to propose validated, adapted, and valuable models.

Given the sensitivity of the topic, a thoughtful and comprehensive approach is necessary to bridge the existing knowledge gap in the healthcare field.

1.1.3. The Role of Open Health Communities in Healthcare

The concept of open innovation serves as a crucial contextual background facilitating the transfer of knowledge within the communities. Communities can effectively leverage the collective expertise and resources of their members by embracing open innovation principles, ultimately leading to optimal outcomes in knowledge transfer. As highlighted by Kohler and Chesbrough (2019), community members play an active role as creators, collaborating to co-create innovations and contribute to the value creation. Thus, individuals from diverse backgrounds come together, drawing upon their unique experiences and insights to drive innovation in healthcare practices, research, and solutions. Within the realm of health communities, the integration of open innovation parameters gives rise to what we term as the open health community in this thesis.

Open innovation is increasingly recognized as a fundamental instrument for tackling intricate challenges in the realm of health sciences research. It offers various solutions and platforms to both the community and domain experts as problem solvers (Hill et al., 2017). Meeting the demand for fast and reliable health information (here-and-now) becomes a priority for individuals, as they seek personalized information from trusted sources (Marmot, 2005; Jong-Wook, 2005; Petraite et al., 2018; Mazenyte & Petraite, 2019). Digital technology plays a crucial role in driving communities to collaborate effectively, fostering the creation of social, economic, and public value (Romanelli, 2018).

The notion of open innovation, first introduced by Professor Henry Chesbrough of the University of California, Berkeley, centres on the incorporation of external concepts, technologies, and resources into an organization's innovation processes. In the context of open innovation, the term "open" denotes a two-way exchange of ideas and knowledge, permitting both inflows and outflows within the organization. The fundamental tenet of open innovation is rooted in the deliberate management of knowledge flows, encompassing external knowledge sources and harnessing internal knowledge to elevate the innovation efforts and maximize their efficiency (Chesbrough, 2003). Organizations often embrace open innovation as a means to stimulate greater innovation output, accelerate the pace of innovation, and enhance the returns on their innovative efforts. This approach is driven by the desire to foster their competitive advantage within established markets as well as to explore and seize opportunities in new markets. The organizations aim to amplify the volume of innovative ideas generated, expand the innovation process, and maximize the overall value derived from their innovation initiatives by engaging in open innovation (Chesbrough, 2003). In summary, the development of the open innovation concept has been catalysed by the demands of the knowledge economy and the interconnected nature of the globalized world. As knowledge production becomes more specialized and dispersed, organizations recognize the need to tap into the external sources of expertise to fuel their innovation efforts. Open innovation enables organizations to access and integrate external knowledge, driving the generation of novel ideas and the realization of competitive advantages in a rapidly changing environment.

According to Chesbrough (2003, 2007), the concept of open innovation arises from the recognition that valuable ideas can originate from various sources, including both internal and external environments of an organization. Moreover, the ability to bring these ideas to market successfully does not rest with the originate organization, but can be achieved through collaborations and partnerships with other entities that share meaningful innovation connections as well (see Table 3).

Table 3. Summary of key open innovation definitions

Author	Definition	Key elements
Chesbrough, 2003	"Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology. Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model."	Use of external and internal ideas
Chesbrough, 2006	"Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology."	Knowledge inflows; knowledge outflows; use of external and internal ideas
Vanhaverbeke et al., 2014	"Open innovation is a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model."	Knowledge management
West and Gallagher, 2006	"It is understood as the systematic encouragement and exploration of a wide range of internal and external sources for innovative opportunities, the integration of this exploration with firm capabilities and resources, and the exploitation of these opportunities through multiple channels."	Internal and external sources; integration; exploitation
Bogers et al., 2016	"The boundaries between a firm and its environment have become more permeable; innovations can easily transfer inward and outward between firms and other firms and between firms and creative consumers, resulting in impacts at the level of the consumer, the firm, an industry, and society."	Knowledge transfer inward and outward; creativity at different levels

Fasnacht, 2018	"Open innovation is hardly aligned with the ecosystem theory and not a linear process. Adoption for the financial services uses open innovation as basis and includes alternative forms of mass collaboration, hence, this makes it complex, iterative, non-linear, and barely controllable. The increasing interactions between business partners, competitors, suppliers, customers, and communities create a constant growth of data and cognitive tools. Open innovation ecosystems bring together the symbiotic forces of all supportive firms from various sectors and businesses that collectively seek to create differentiated offerings."	Ecosystem theory; complexity
Teece, 2020	"Open innovation and dynamic capabilities have a lot in common. They are both quite general and require contextual specifications. They have organizational as well as a managerial implications; and they can be applied at the business unit, enterprise, or ecosystem level. … open innovation is essentially a set of processes."	OI and dynamic capabilities; processing

The presented definitions enlighten the key principles of open innovation, which include the dynamic exchange of knowledge and resources between an organization and its external environment. They emphasize the importance of harnessing ideas from both internal and external sources and acknowledge that innovation can be fostered through diverse mechanisms and collaborations.

Therefore, innovation involves not only the internal generation and development of ideas but the open sharing of information, knowledge, and ideas with external parties as well. This collaborative approach allows organizations to tap into a wider pool of expertise and perspectives, enabling them to gain valuable insights and feedback throughout the innovation process.

West and Gallagher (2006) illuminated the core essence of open innovation, characterizing it as a strategic methodology characterized by the intentional encouragement and investigation of a broad spectrum of both internal and external origins in order to uncover innovative possibilities. They underscored the significance of harmonizing this exploration with the organization's unique competencies and assets, followed by the effective exploitation of these recognized opportunities via diverse channels. Their description elucidates the fundamental principles of open innovation, accentuating the proactive quest for and application of external knowledge, concepts, and collaborations to drive innovation within the organization.

Furthermore, West and Gallagher's definition underscores the dynamic nature of open innovation, which entails the continuous exploration and exploitation of opportunities throughout the innovation process. It emphasizes the importance of actively connecting and integrating external knowledge and ideas with the internal

resources and capabilities of the firm. The organizations can maximize their innovation potential and create a growth effect by combining the strengths of internal and external stakeholders (West & Gallagher, 2006).

Bogers et al. (2017) enlightened the evolving dynamics of innovation ecosystems by highlighting the increasing permeability of boundaries between firms and their external environment. They emphasize that in contemporary interconnected world, innovations have the ability to flow inward and outward, transcending organizational boundaries. This perspective recognizes the immense value in actively engaging with external stakeholders (as customers or business firms or research institutions, etc.), to harness their expertise and leverage their insights. If organizations embrace this openness, they can reach external resources, perspectives, and capabilities that can foster innovation and drive competitive advantage. Ultimately, society as a whole stands to gain from the positive impacts generated by these cross-boundary exchanges, as innovation becomes a driving force for economic growth, societal progress, and improved quality of life (Bogers et al., 2017).

Fasnacht (2018) wrote about the relationship between open innovation and ecosystem theory, highlighted the complex nature of open innovation processes, particularly in the context of the financial services industry. The author points out that open innovation goes beyond the traditional linear models and embraces alternative forms of collaboration. This approach introduces elements of complexity, iteration, non-linearity, and limited controllability, reflecting the multifaceted dynamics inherent in the open innovation practices.

In this context, open innovation transcends organizational boundaries and encourages the active participation and collaboration of diverse stakeholders, including business partners, competitors, suppliers, customers, and communities. The interactions among these entities generate a wealth of data and foster the development of cognitive tools, creating a cycle of knowledge creation and exchange. The alignment of open innovation with the ecosystem theory emphasizes the interconnectedness and interdependencies among diverse stakeholders (Fasnacht, 2018).

Teece (2020) highlights the interplay between open innovation and dynamic capabilities. He stresses that both concepts possess a general nature and require contextual specifications to be effectively applied. Teece emphasizes that open innovation and dynamic capabilities have implications not only at the organizational level but at the managerial level as well, offering a wide scope for application, ranging from individual business units to entire enterprises and ecosystems.

According to Teece's perspective, open innovation can be framed as a collection of processes, as opposed to a solitary occurrence. It encompasses a variety of actions, tactics, and mechanisms designed to facilitate the exchange of ideas, information, and assets across the borders of organizations. These processes necessitate the active participation of both internal and external stakeholders with the objective of generating value and encouraging innovation. The researcher asserts that open innovation should not be perceived as a universally applicable approach but rather as

an adaptable framework that can be adjusted and tailored to meet the distinct requirements and conditions of various organizations and situations (Teece, 2020).

The open innovation method is increasingly being implemented in various advanced business sectors, involving a broader circle of stakeholders in the innovation process. Open innovation can be described as a new paradigm in the process of innovation creation, widely used in the academic research, business practices, and becoming increasingly important in policy formation concepts. The application of open innovation is a method of innovation generation where organizations can and should utilize the external resources, integrating them into their internal resources to provide unique added value to the innovation that is being developed. When using the open innovation method, the combination of internal and external resources creates new information structures, fosters innovation, and brings benefits to the organizations (Bogers, Chesbrough, & Moedas, 2018).

According to Vaišnorė and Petraitė (2011), the implementation of open innovation model has implications for structures, goal setting, and innovation strategies of organizations. Its aim is to enhance and facilitate the flow and sharing of knowledge between the external stakeholders and internal actors within the healthcare system. Users' knowledge and experiences serve as valuable sources of information, providing insights into their skills, needs, application methods, and various other aspects that are relevant to the research subject or healthcare process. Engaging users in the innovation process allows their creativity and problem-solving abilities (Füller & Matzler, 2007; Füller, Matzler, & Hoppe, 2008). Promoting openness through information sharing among stakeholders is crucial to prevent misunderstandings, reduce uncertainties, and mitigate communication issues (Coyne et al., 2015). Establishing trust-based relationships among actors becomes easier with open communication channels. In the healthcare ecosystem, diverse stakeholders undertake distinct roles with each contributing significantly to the collaborative creation of valuable products. This ecosystem encompasses both conventional participants, including public and private institutions, hospitals, and universities, as well as unconventional participants, such as physicians, nurses, and patients. Presently, healthcare ecosystems grapple with the difficulties of delineating effective organizational structures and cultivating open innovation (Secundo et al., 2018). Users can contribute to the generation and evaluation of new healthcare ideas, development and assessment of healthcare concepts, discussions and improvements in the healthcare practices, personalization and testing of healthcare prototypes, experimentation with novel healthcare features, and obtaining information about new healthcare products or their usage practices.

Open innovation represents a contextual framework that enables the transfer of knowledge. However, in the field of healthcare management, the full potential of open innovation has not been adequately explored. The application of open innovation models in practice remains limited, despite its potential to foster the creation of novel knowledge for the health-related models. A well-defined concept of open innovation within the health communities can have a positive impact as well. If adaptable models are developed, it will be possible to address the theoretical gaps and improve the

outcomes in health management. While open innovation has traditionally been applied and defined within business models as a distributed innovation process facilitated by purposeful knowledge flows across organizational boundaries (Chesbrough et al., 2014), there is an emerging discussion on applying the open innovation perspective to healthcare. Various approaches explore the potential of open innovation in the healthcare sector.

In their study on open innovation, West and Bogers (2013) conducted a thorough exploration of a crucial role played by the external partnerships, collaborations, and knowledge exchange in driving innovation (West & Bogers, 2013). Their research sheds light on the significance of these elements and underscores the immense potential that the open innovation holds for transforming healthcare delivery, revolutionizing patient care, and catalysing the development of innovative medical technologies. Embracing open innovation practices, organizations in the healthcare sector can tap into a vast network of external expertise, resources, and ideas, leading to the accelerated advancements and breakthroughs in the field. This collaborative approach allows for the seamless integration of diverse perspectives, fostering a dynamic ecosystem that fosters creativity, efficiency, and ultimately, improved outcomes for both healthcare providers and patients alike (West & Bogers, 2014). Furthermore, by engaging in open innovation, healthcare organizations can leverage the collective wisdom and experience of external stakeholders, including patients, researchers, industry partners, and regulatory bodies, to co-create solutions that address complex healthcare challenges and drive sustainable innovation in the industry.

Lakhani and von Hippel have extensively studied open innovation and user innovation with a particular emphasis on the active participation of users and communities in the innovation process. Their research underscores the advantages of user-driven innovation and co-creation (Lakhani & von Hippel, 2003). In the context of healthcare, user innovation, specifically involving patients in innovation processes, holds significant importance.

As stated by Dandonoli (2013), open innovation represents a compelling concept centred on the integration of internal and external ideas as well as avenues to the market with the goal of advancing processes or technologies. This concept offers an attractive framework for nurturing partnerships among entities and individuals, whether in developed or developing countries. Through the adoption of open innovation, collaborations can be organized to enable authentic co-creation among partners, regardless of whether they are in resource-rich or resource-poor environments. This approach promotes fairness and generates substantial impact and value for each participant (Dandonoli, 2013).

According to the paper conducted by Wass and Vimarlund (2016), there is a noticeable gap in the exploration of open innovation within public contexts, despite the growing interest and recognition of the significance of collaborative approaches and increased cooperation among various healthcare actors. The limited emphasis on the open innovation research within public settings presents a hurdle to gaining a comprehensive understanding of the potential advantages of open innovation

strategies in the healthcare field. Consequently, there is an urgent requirement for additional exploration and research efforts aimed at closing this gap and broadening the comprehension on how open innovation can be applied in public healthcare contexts and the consequences it may entail (Wass & Vimarlund, 2016).

Scholars have made contributions to this study view of open innovation within the healthcare context (see Table 4). Their valuable insights have brought attention to the immense benefits that the open innovation can offer in this context. These scholars have not only explored various collaborative models but offered insights about the significance of involving patients, users, and external stakeholders in the innovation process as well. This inclusive approach leads to the development of patient-centric solutions, improved healthcare services, and enhanced patient experiences. The involvement of patients, users, and external stakeholders is a crucial aspect that these scholars have emphasized.

Table 4. Summary of the key open innovation definitions in healthcare sector

Author	Definition	Key elements
Bullinger et al., 2012	"OI used to investigate the adoption of an open health platform by patients, care givers, physicians, family members, and the interested public. OI practices in health care lead to interesting innovation outcomes and are well accepted by participants."	Actors, innovation outcomes
Reinhardt et al., 2014	"The OI concept, therefore, postulates that ideas and knowledge should be used as both inputs and outputs for the innovation process. In contrast to other industries, the healthcare industry holds peculiarities that influence and restrict the OI concept. Differences in organizations, norms, regulations and data protection, intellectual property protection culture as well as innovation complexity and information asymmetry."	Phenomenological differences, innovation complexity, information asymmetry
Gabriel, Stanley, and Saunders, 2017	"OI in health, as we define it, refers to new forms of collaboration between different actors involved in the health innovation process. Notably, it refers to new kinds of collaboration between public sector (health service and/or research organizations) and private sector organizations; health service/research organizations and their employees (practitioners and researchers); health service/research organizations and the patients and citizens they serve."	Collaboration, actors, public and private sectors, orchestration
Silva, Schaibley, and Ramos, 2018	"A fundamental premise of open innovation is that inter-firm knowledge transfer can accelerate R&D. In industries where complexity and a diversity of capabilities, and	Knowledge transfer, R&D

	specialized infrastructure are required to bring a solution to market, open innovation is touted as a business method where channels of external cooperation can be synergistic. Healthcare is such an industry."	

In a research conducted by Bullinger et al. (2012), the concept of open innovation was investigated within the context of a healthcare platform. The study specifically examined how this open health platform was adopted by a diverse group of stakeholders, including patients, caregivers, physicians, family members, and the general public interested in the healthcare matters. The primary goal of the research was to explore the outcomes resulting from the implementation of open innovation practices in the healthcare domain and evaluate the level of acceptance among the participants. The findings from this study clearly indicated that stakeholders, ranging from patients to caregivers, physicians, family members, and individuals with a keen interest in healthcare, recognized the significant value of open innovation within the healthcare sector. This recognition highlights the expanding body of knowledge related to the open innovation in healthcare and underscores the critical need for ongoing exploration and integration of open innovation practices to drive transformative advancements within the field (Bullinger et al., 2012).

Reinhardt et al. (2014) made a significant contribution to the understanding of open innovation and its relevance in the healthcare sector. The healthcare industry is marked by unique characteristics that both shape and constrain the adoption of open innovation practices. These distinct attributes encompass the differences in organizational structures, norms, regulatory frameworks, data protection measures, intellectual property protection culture, the intricacy of innovation, and the prevalence of information asymmetry. The intricate nature of healthcare innovation further complicates the application of open innovation principles. Furthermore, information asymmetry is a prevalent feature within the healthcare industry where various stakeholders possess differing levels of knowledge and access to information, influencing the sharing and exchange of ideas. It is important to recognize that healthcare organizations hold the potential to leverage open innovation to enhance patient outcomes and improve the overall delivery of healthcare services (Reindhart et al., 2014).

Gabriel, Stanley, and Saunders (2017) have defined OI in healthcare as an encompassing concept that involves innovative forms of collaboration among diverse stakeholders engaged in the health innovation process. More specifically, it entails the emergence of new modes of collaboration between public sector entities, such as health service providers or research institutions and private sector organizations. The synergy between public and private sector players in the healthcare sphere facilitates the exchange of resources and knowledge. Moreover, the collaboration between healthcare service and research organizations and their practitioners and researchers promotes the internal transfer of knowledge. This collaborative approach plays a serious role in facilitating the co-creation of innovative solutions designed to address

the intricate and evolving healthcare requirements of both individuals and communities (Gabriel, Stanley, & Saunders, 2017).

Silva, Schaibley, and Ramos (2018) explored the fundamental premise of open innovation, which highlights the importance of inter-firm knowledge transfer in accelerating R&D activities. They emphasized that in the industries characterized by complexity, diverse capabilities, and the need for specialized infrastructure to bring innovative solutions to the market, open innovation is recognized as a valuable business method that leverages external cooperation channels for synergistic outcomes. The healthcare industry serves as a prime example of such an industry. The healthcare organizations can leverage the diverse perspectives and specialized resources available beyond their internal boundaries by embracing open innovation principles (Silva, Schaibley, & Ramos, 2018).

While open innovation holds great potential in the healthcare industry, it is important to navigate certain challenges and considerations. These may include: safeguarding intellectual property, addressing regulatory constraints, ensuring data privacy and security, and managing collaborative relationships effectively. Organizations must establish appropriate governance structures, determine clear communication channels, and foster a spirit of trust and mutual benefit among partners (Silva, Schaibley, & Ramos, 2018).

The study conducted by Secundo et al. (2019) delves into the open innovation literature pertaining to inter-organizational networks, specifically within the healthcare ecosystems, and examines knowledge transfer processes. These scholars have made significant contributions to the comprehension of knowledge transfer, particularly within the realm of open innovation, with a specific focus on the healthcare ecosystems. After exploring the intricacies of knowledge transfer, their research sheds light on the dynamics and complexities involved in the open innovation within the healthcare sector, leading to the enhanced insights and a deeper understanding on how open innovation can be effectively harnessed in the healthcare ecosystems (Secundo et al., 2019).

Applying open innovation principles becomes instrumental in achieving optimal outcomes in knowledge transfer within the communities (outside-in) and between separate communities (inside-out). Community members evolve into active creators who collaboratively generate innovation and play a role in value creation (Kohler & Chesbrough, 2019). Knowledge transfer within health communities can be understood from two perspectives, i.e., outside-in and inside-out.

Knowledge transfer occurs among the participants within healthcare communities where both senders and receivers can be the same members. However, open health communities distinguish themselves by integrating information from external entities into the knowledge creation process: a phenomenon that is known as outside-in knowledge transfer. Additionally, these communities, which collaboratively generate knowledge and foster community-driven innovation, openly share their insights and findings with other communities or society: a process referred to as inside-out knowledge transfer.

Outside-in KT refers to the process of acquiring knowledge from external sources into a specific health community. It involves gathering insights, information, and expertise from sources outside the community, such as research institutions, healthcare organizations, government agencies, and other community networks. Outside-in knowledge transfer may occur through various channels, including published literature, conferences, seminars, collaborative projects, and online platforms. The goal is to leverage external knowledge to enrich the community's understanding, improve practices, and address healthcare challenges.

Community members are driven by their motivation to exchange information and share their knowledge, making them valuable contributors to the innovation process (von Hippel, 2016). Their self-interest and dedication to meeting the needs of the community play a crucial role in the development of new pathways that can improve access to healthcare, shift focus from clinical solutions to holistic health approaches, and provide individuals with the necessary answers to their health concerns (Petraite et al., 2018). Inside-out KT involves sharing knowledge generated within a health community with external stakeholders or other communities. It entails disseminating insights, innovations, best practices, and experiences developed within the community to broader audiences. Inside-out knowledge transfer fosters collaboration, promotes transparency, and contributes to the collective advancement of healthcare knowledge and practices. This process may involve publishing research findings, participating in knowledge-sharing events, engaging with policymakers, collaborating with industry partners, and contributing to open-access platforms. Overall, both outside-in and inside-out knowledge transfer play crucial roles in enhancing the resilience, innovation, and effectiveness of health communities. The health communities can contribute to the continuous improvement of healthcare delivery, patient outcomes, and public health initiatives by actively engaging in knowledge exchange with external entities and sharing valuable insights with broader audiences.

Empowering communities and effectively managing existing knowledge facilitate the desired flow of knowledge, positively influencing decision-making processes by patients in any given moment and location (Tang & Smith, 2016). Community knowledge is complex, encompassing tacit knowledge, experiential insights, and culturally embedded wisdom. Embracing a fusion of diverse knowledge sources becomes imperative, as they collectively shape patients' behavioural in decision-making processes. However, health communities as well face challenges associated with complexity and information asymmetry. The healthcare industry with its distinctive organizational norms, regulations, data protection measures, intellectual property culture, and innovation complexity exemplifies these differences (Reinhardt et al., 2014). Effectively managing complexity through knowledge management and open innovation allows for the exploration of new and innovative approaches to address the health challenges, consider situations from multiple perspectives, and identify appropriate tools to achieve desired outcomes.

The importance of open health communities in facilitating knowledge transfer appears through several key mechanisms as a free flow of information. Members share

their experiences, expertise, research findings, and insights openly within the community. This open exchange fosters a rich environment for knowledge transfer, allowing individuals to learn from each other and stay updated on the latest developments in the healthcare. Knowledge transfer is not limited to one-way communication but rather thrives on collaboration and interaction. Open health communities serve as platforms for collective intelligence where members collaborate to co-create new knowledge and innovations. Individuals can be in touch with a complex healthcare challenges, develop novel solutions, and drive innovation forward.

Overall, open health communities serve as dynamic hubs for knowledge transfer, fostering an environment where information is shared freely, collaboration is encouraged, and innovation flourishes. These communities have the potential to drive positive change and advance the frontiers of healthcare knowledge and practice by harnessing the collective intelligence and creativity of its members.

1.2. Conceptualization of Knowledge Transfer

Knowledge management (KM) theory encompasses a set of ideas, fundamental principles, and operational methods designed to proficiently oversee knowledge within the organizations. It encompasses tactics and procedures for acquiring, generating, structuring, retaining, distributing, and leveraging knowledge to amplify the organizational effectiveness and stimulate innovation (Nonaka & Takeuchi, 1995; Wiig, 1997; Davenport & Prusak, 1998; Alavi & Leidner, 2001).

Knowledge transfer has emerged as a critical concept in management theory, focusing on the movement of knowledge from one entity to another within an organization or across organizational boundaries. It is rooted in various management theories and frameworks that recognize the importance of knowledge as a valuable resource for organizational success and innovation (Nonaka & Takeuchi, 1995; Szulanski, 1996; Grant, 1996).

Knowledge transfer entails the act of disseminating knowledge from one person, group, or entity to another with the objective of improving comprehension, competencies, and innovation. This process encompasses the interchange, transmission, and utilization of knowledge in multiple manifestations, encompassing explicit (codified) knowledge and tacit (individual, experiential) knowledge (Szulanski, 1996; Grant, 1996). Knowledge transfer and knowledge dissemination are related concepts but differ in their focus and scope. Knowledge transfer focuses on the movement of knowledge from one entity (or individual) to another; knowledge dissemination is concerned with making knowledge widely accessible and understandable to the specific audiences. Argote and Ingram (2000) define knowledge transfer as a process in which the experience of one unit (such as a group, department, or division) influences another unit.

Scholars delve extensively into the intricacies of knowledge transfer, its conceptual framework, the fundamental theories underpinning it, and the factors that shape its efficacy. Their scholarly endeavours encompass an examination of how organizations can harness the process of knowledge transfer to augment their

competitive edge and stimulate innovation. This comprehensive analysis not only sheds light on the theoretical foundations but as well offers practical insights into the strategic use of knowledge transfer within the organizational contexts, ultimately aiming to empower businesses and institutions to thrive in a rapidly evolving knowledge-driven landscape.

Nonaka and Takeuchi's seminal work explores the notion of the knowledge-creating organization. They introduce the SECI model (Socialization, Externalization, Combination, Internalization) as a framework to elucidate the intricate processes involved in the generation, dissemination, and transformation of knowledge within the enterprises. This model underscores the pivotal role of social interactions, the conversion of both explicit and tacit knowledge, and the iterative nature of knowledge creation. The book offers a wealth of case studies and instances drawn from Japanese firms to illustrate the dynamics underpinning knowledge transfer and innovation (Nonaka & Takeuchi, 1995).

Szulanski's study investigates the phenomenon of "internal stickiness" and its implications for knowledge transfer within the organizations. Internal stickiness refers to the difficulties encountered when trying to transfer the best practices or knowledge from one part of the organization to another. The study identifies factors, such as tacit knowledge, cognitive limitations, and organizational routines, that contribute to the stickiness of knowledge. After understanding these impediments, the organizations can develop strategies to overcome them and enhance knowledge transfer processes (Szulanski, 1996).

Argote and Ingram's study examines knowledge transfer as a potential source of competitive advantage for the organizations. They investigate the mechanisms and conditions that facilitate the effective knowledge transfer within and across organizational units. The study emphasizes the role of learning processes, such as repeated interactions, shared experiences, and knowledge integration, in enhancing knowledge transfer. If understanding how knowledge transfer contributes to the competitive advantage, organizations can develop strategies to promote effective knowledge sharing and utilization (Argote & Ingram, 2000).

Osterloh and Frey's research explores the relationship between motivation and knowledge transfer within the organizations. They investigate how different forms of motivation, such as intrinsic and extrinsic motivation, influence knowledge transfer processes. The study as well considers the role of organizational forms, such as hierarchical versus decentralized structures in facilitating or hindering knowledge transfer. The organizations, by understanding the motivational factors and organizational structures that affect knowledge transfer, can design strategies and structures that promote effective knowledge sharing and collaboration (Osterloh & Frey, 2000).

Hansen, Nohria, and Tierney's article explores different strategies for managing knowledge within the organizations. They discuss the importance of creating a knowledge-friendly culture, developing processes to facilitate knowledge flows, and leveraging technology to support knowledge transfer. The authors provide insights into various approaches such as codification (capturing explicit knowledge),

personalization (facilitating tacit knowledge sharing), and leveraging networks and communities of practice for knowledge exchange. After adopting effective knowledge management strategies, the organizations can enhance knowledge transfer, foster innovation, and gain a competitive advantage (Hansen, Nohria, & Tierney, 1999).

The aforementioned studies offer valuable and comprehensive insights into the intricate concept of knowledge transfer within the organizational contexts. They shed light on various facets related to knowledge transfer, encompassing the challenges of internal knowledge retention, the SECI model delineating knowledge creation, the pivotal role of learning processes, motivational determinants, and the implementation of effective knowledge management strategies. These studies highlight how important it is to understand and overcome barriers that block knowledge transferring. They suggest working together and creating an environment where sharing knowledge is encouraged.

The organizations can fortify their capacity to efficiently share and harness knowledge by harnessing these insights, resulting in enhanced innovation, bolstered competitive advantage, and heightened overall organizational performance. The discoveries gleaned from these studies serve as a robust foundation for the formulation of practical strategies and approaches aimed at facilitating the intricate processes of knowledge transfer within the organizations.

These studies play a big role in making knowledge management work well, especially in the healthcare settings, helping organizations succeed. According to Sørensen et al. (2012) identified and summarized areas of health literacy and their description, it can be argued that the latter conceptual model essentially reflects the domains of patient knowledge structure and the necessary skills to achieve in the domain that are critical to the patient empowerment but can be supplemented by integrating Kratwohl's (2002) expanded original Bloom's a taxonomy, indicating specific types of knowledge.

Moreover, according to Vainauskiene and Vaitkiene (2022) and Vainauskiene and Zemaitaitiene (2023), four knowledge dimensions are defined in terms of health communities: (1) factual knowledge encompasses terminology, specific details, and foundational elements that are relevant to a particular discipline or subject matter. It serves as the fundamental knowledge required for gaining familiarity with a discipline or object. In the realm of health literacy, this comprehensive knowledge involves patients' capacity to access information pertaining to medical and clinical concepts, health risk factors, and determinants within both physical and social environments. However, patients may initially understand this information in a fragmented manner. Factual knowledge forms the cornerstone of patient understanding, upon which other types of knowledge are subsequently built. (2) Conceptual knowledge encompasses the interrelationships among the fundamental elements and the overarching frameworks that enable their coherent operation. This includes an understanding of categorization and classifications, principles and generalizations as well as familiarity with theories, models, and structures. It is a form of knowledge that goes beyond the isolated facts and data, emphasizing the ability to grasp the conceptual underpinnings that unite the diverse elements into a cohesive whole. As a patient is able to obtain

and understand factual knowledge in the fields of healthcare, his/her awareness grows, because knowing the connections of the basic elements allows to understand the information related to his/her disease holistically. (3) Procedural knowledge addresses the question of "how?" by providing insights into methods, criteria, and algorithms that are necessary to execute a specific action. In the context of patient health literacy, when individuals can access information regarding their health condition and comprehend it comprehensively, their self-confidence increases. Subsequently, they are empowered to apply this knowledge effectively in real-life healthcare scenarios, disease prevention, and health promotion efforts. Patients then analyse and evaluate the outcomes of their informed decisions, contributing to their ongoing engagement and understanding of their health management process. (4) Metacognitive knowledge refers to the strategic and reflective understanding of how to approach problem-solving and cognitive tasks. It encompasses the contextual and conditional knowledge as well as self-awareness. This type of knowledge reflects an individual's capacity to contemplate their cognitive experiences and exercise control over them.

In the framework of the traditional theory of knowledge management, numerous studies have demonstrated a correlation between an individual's self-confidence and his/her knowledge structure (Flynn & Goldsmith, 1999; Alba, Hutchinson, 2000).

According to Jucevičiene and Šajeva (2012), the formation of the knowledge management system is extremely important to trust and favourable atmospheres, the creation and sharing of knowledge, ensuring knowledge evaluation, appropriate knowledge processing and knowledge application. When creating a knowledge system, individual and organizational level assumptions are important, which must coincide. It is important that individuals should be able to turn latent knowledge into expressed and share knowledge and communicate effectively, and management organizations should foster an appropriate environment and motivate the knowledge processes of organizational members. Jucienė and Šajeva (2008) presented the types of knowledge, which they divided based on the epistemological and ontological points of view and distinguished other types of knowledge (see Figure 7).

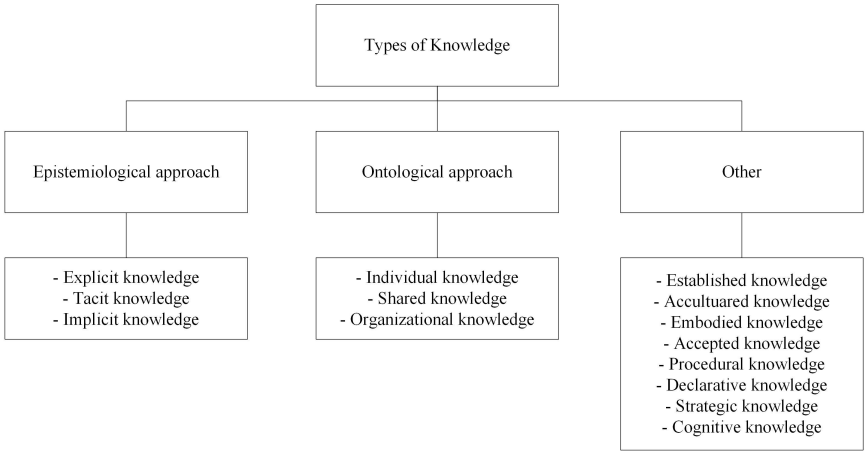


Figure 7. Classification of knowledge typology

Delving deeper into an epistemological approach involves examining the different types of knowledge: tacit, explicit, and implicit. Explicit and tacit knowledge was introduced by Nonaka and Takeuchi in their work on knowledge creation. Explicit knowledge is information that can be easily expressed, documented, and communicated by using formal language or written documentation. Explicit knowledge is information that can be easily expressed, documented, and communicated using formal language or written documentation. It can be written down, recorded, or shared explicitly (Nonaka & Takeuchi, 1995). Explicit knowledge could turn in to documents, databases, toolkits, quality standards. Explicit knowledge lays an essential base to knowledge transfer and storage. However, tacit knowledge is implicit, personal, and difficult to articulate or transfer through traditional means. It is often gained through experience, intuition, and practice (Nonaka & Takeuchi, 1995). It often occurs as intuitive or know-how knowledge, which is difficult to obtain and is the most valuable kind of knowledge for innovation and improvement.

Implicit knowledge expands on the explicit and tacit knowledge distinction. Implicit knowledge refers to the knowledge that is not consciously recognized or articulated but is embedded in individual actions, behaviours, and routines. It is different from tacit knowledge, as it may be accessible with reflection or observation (Polanyi, 1966).

Explicit and tacit knowledge, as introduced by Nonaka and Takeuchi in their seminal work on knowledge creation, constitutes a fundamental dichotomy within the realm of knowledge. Explicit knowledge pertains to information that can be readily expressed, formalized, and conveyed by using a structured language or through various forms of documentation. It can be transcribed, documented, or explicitly communicated (Nonaka & Takeuchi, 1995). Explicit knowledge finds manifestation in documents, databases, toolkits, and quality standards. It serves as a cornerstone for knowledge transfer and storage, offering a tangible and codified repository of information. In contrast, tacit knowledge embodies a different facet of knowledge, i.e., an implicit, deeply personal facet that defies easy articulation or conventional transmission methods. Tacit knowledge often accrues through firsthand experience, intuition, and practical application (Nonaka & Takeuchi, 1995). It frequently manifests as intuitive or know-how knowledge, which is challenging to distil or encapsulate through formal means. Remarkably, tacit knowledge represents one of the most invaluable forms of knowledge, particularly in the context of innovation and enhancement.

Expanding on the differentiation between the explicit and tacit knowledge, implicit knowledge enters the discourse as a distinctive category. Implicit knowledge encompasses knowledge that is not consciously acknowledged or articulated but is ingrained within an individual's actions, behaviours, and routines. It diverges from the tacit knowledge as it may become accessible through introspection or observation (Polanyi, 1966). Implicit knowledge operates on a subtler level, underpinning the actions and behaviours of individuals, often eluding conscious recognition but nonetheless influencing decision-making and problem-solving processes.

1.2.1. Knowledge Transfer in Open Health Communities

From the viewpoint of knowledge management theory, it is recognized that the conventional knowledge management processes encompass a network of interrelated activities. These activities encompass knowledge retrieval, identification, transmission, dissemination, assimilation, and the process of knowledge generation (Petraite et al., 2018). Within the domain of knowledge management (KM) in healthcare, a blend of formal methodologies, models, and techniques serves as a facilitator for the collaborative development, recognition, cultivation, dissemination, and application of knowledge assets spanning diverse healthcare organizations (Abidi, 2001). These studies delve into the KM models encompassing both explicit and tacit knowledge, collaborative problem-solving that is grounded in medical experiences, enhancements in education for both medical practitioners and patients, the realm of social knowledge, health communities, areas of interest and expertise as well as the rich data contained within the medical records.

In light of the objectives, the theoretical part of the thesis is grounded to elucidate the organization and facilitation of knowledge transfer within the open health communities to foster community-driven innovation and delve into pertinent aspects of knowledge management theory. This includes examining the key concepts and models that emphasize collaborative knowledge creation and transfer, specifically tailored to the unique dynamics of open health communities.

Overall, the theoretical part of the thesis provides an overview of knowledge management theory, especially the knowledge transfer part, offering insights into its relevance, applicability, and implications for effectiveness.

In the context of public health, the implementation of knowledge management processes is primarily geared towards nurturing change and innovation within the transdisciplinary settings (Mareeuw et al., 2015). A comprehensive view of collaborative efforts involving multiple stakeholders for innovation underscores theimportance of knowledge management in healthcare (Mareeuw et al., 2015). The knowledge accumulated through the processes of knowledge co-creation is regarded as pertinent (Haynes et al., 2019). The principal aim of knowledge transfer (KT) is to identify, collaboratively produce, integrate, disseminate, and distribute both existing and novel knowledge, recognizing that a failure to do that effectively can yield adverse consequences for future value generation (Ng et al., 2012). Furthermore, KT can be perceived as the adoption of accessible knowledge in novel contexts, thus fostering the emergence of fresh ideas and enriching the landscape of innovation processes (Christensen, 2003).

Knowledge transfer is a vital process in health communities, as it enables the collective achievement of improved public health outcomes. With the proliferation of diverse knowledge sources and the emergence of online health communities alongside traditional direct communities, knowledge transfer occurs in a multidirectional and multisided manner. This necessitates the implementation of systematic knowledge transfer management practices across the health communities.

Knowledge transfer introduces methodologies for disseminating both tacit and explicit knowledge, placing significant emphasis on the worth of ideas and

experiences across a multitude of industries (Hassan et al., 2017). Knowledge management encompasses a spectrum of activities, including knowledge creation, transfer, application, storage, identification, and acquisition. Knowledge transfer assumes a particularly pivotal role in engendering added value (Hassan et al., 2017; Narteh, 2008; Parent et al., 2014). Knowledge flow, at its core, denotes the transmission of knowledge from one individual or entity to another. At the community level, there exists a continuous exchange of knowledge among stakeholders with an inherent acknowledgment of the value that is intrinsic to both tacit and explicit knowledge. Nonaka's knowledge creation model offers a conceptual framework that delineates four conceivable knowledge flows involving tacit and explicit knowledge (socialization, externalization, internalization, and combination), each necessitating distinct activities and ultimately contributing to the generation of novel knowledge (Chau et al., 2013).

In the context of healthcare, KT entails the dynamic exchange of tacit and explicit knowledge among the stakeholders within the healthcare ecosystem, especially during the exploration and exploitation phases. Actively involving patients in the processes of knowledge co-creation and transfer, where they contribute their know-how and experiential insights to forge novel approaches for managing specific health issues, holds the potential to significantly bolster innovation (Secundo et al., 2019; Amann & Rubinelli, 2017). Tacit knowledge, comprising practical expertise and experiential wisdom, frequently resides within the minds of various stakeholders, including patients, healthcare professionals, and researchers. A primary challenge confronted by the healthcare systems is the conversion of this tacit knowledge into explicit organizational knowledge, a critical driver of innovation within the healthcare services and institutions (Amann & Rubinelli, 2017).

Despite the widespread recognition of the value inherent in patient participation, the processes of knowledge co-creation and transfer are often in their primary stages with healthcare systems that are primarily focused on gathering information from patients rather than actively co-creating knowledge with them (Amann & Rubinelli, 2017). Unraveling the intricacies of various partnerships and the mechanisms by which participation can foster the development and application of generated knowledge represents a formidable challenge (Jull et al., 2017). Tensions, misinterpretations, and variances in health literacy levels among different stakeholder groups contribute to the delays in knowledge transfer, thereby complicating service delivery (Laihonen, 2012). Consequently, there is a thriving interest and sustained efforts aimed at crafting collaborative models that facilitate the generation of knowledge involving knowledge users, researchers, and other stakeholders. The ultimate goal is to render knowledge more efficacious and pertinent within the health systems and communities (Jull et al., 2017).

Community members are driven to exchange information and share their knowledge, making valuable contributions to the innovation process due to their self-interest and commitment to meeting the community's needs (von Hippel, 2016). This knowledge aids in the development of new pathways that improve access to healthcare, shift attitudes towards health issues from clinical solutions, and assist

individuals in finding appropriate answers to their health concerns. Open innovation (OI) principles can be employed to achieve the optimal results in knowledge transfer within the community (outside-in) and between separate communities (inside-out). Community members become creators who collaboratively innovate and contribute to the value creation (Kohler & Chesbrough, 2019). OI is increasingly recognized as a vital tool for addressing complex problems in health sciences research. Various solutions and platforms are available to both the community and domain experts as problem solvers (Hill et al., 2017). People seek rapid access to the health information (here-and-now) from trustworthy sources where they can find personalized information (Quintana et al., 2001; Petraite et al., 2018; Mazenyte & Petraite, 2019). Digital technology plays a pivotal role in fostering collaborative efforts within communities, enabling the creation of social, economic, and public value (Romanelli, 2018). Empowering communities and effectively managing existing knowledge facilitate the desired positive influence on knowledge flow (Tang & Smith, 2016).

Prihodova et al. (2018) identified the key components of knowledge transfer in the healthcare context, including communities: message (reflecting the information to be shared), process (activities to implement knowledge transfer), stakeholders (individuals involved in the exchange process), local context (environments where transfer occurs), The primary challenge inherent in this context stems from the inherent diversity among actors within the health communities, who rely on an array of information sources that may not always be subject to the censorship or deemed reliable (May et al., 2007). This diversity in information sources can pose significant hurdles in ensuring the accuracy and trustworthiness of the knowledge being transferred within the healthcare communities.

From the standpoint of knowledge management (KM) theory, it is well-established that conventional KM processes encompass a spectrum of activities, which include knowledge retrieval, identification, transmission, sharing, assimilation, and knowledge generation (Petraite et al., 2018). In the healthcare domain, KM practices may encompass a combination of formal methodologies, models, and techniques aimed at facilitating the co-creation, identification, development, dissemination, and utilization of knowledge assets within different healthcare organizations (Abidi, 2001). These studies as well delve into KM models pertaining to explicit and tacit knowledge, collaborative problem-solving through medical experiences, educational enhancements, social knowledge, health communities, interests and expertise, and data from medical records.

In the public health, knowledge management processes are geared toward important objective, i.e., instigating transformation and nurturing innovations within transdisciplinary contexts (Mareeuw et al., 2015). The holistic perspective concerning collaborative efforts involving multiple actors for innovation accentuates the pivotal role that is played by knowledge management within the healthcare sector (Mareeuw et al., 2015). The knowledge amassed through the processes of knowledge co-creation is regarded as pertinent and highly esteemed (Haynes et al., 2019). The primary aim of knowledge transfer (KT) is to identify, co-create, integrate, disseminate, and distribute both pre-existing and emerging knowledge, underscoring that an ineffective

KT process can yield detrimental consequences for subsequent value generation (Ng et al., 2012). Additionally, KT can be viewed as the adoption of accessible knowledge in new contexts to generate novel ideas and enhance innovation processes (Christensen, 2003).

In order to get a deeper understanding about the knowledge transfer relationships with open health communities and its settings, a systematic literature review is necessary, including the main components of a category "Knowledge transfer". A focused examination was conducted to delineate the core components of knowledge transfer within the health communities. Drawing upon the existing literature, four principal components of knowledge transfer were identified: (1) actors/stakeholders, encompass individuals or entities within health communities who play a role in the exchange and dissemination of knowledge; (2) information sources, serve as reservoirs of knowledge within health communities, providing the foundation for knowledge transfer activities; (3) processes, the mechanisms through which knowledge is transmitted, assimilated, and applied within health communities; (4) outputs, represent tangible outcomes of knowledge transfer endeavours within the health communities.

In the subsequent analysis, the articles were analysed to ascertain their engagement with core components of knowledge transfer within the health communities. This methodological criterion ensured a focused examination of articles that delved into the multifaceted aspects of knowledge transfer dynamics. Through this rigorous approach, a select subset of articles was identified and included in the further analysis, as documented in Table 5.

Table 5. Analysis of "knowledge transfer" factor display

Reference	Display of *Knowledge transfer*	Actors/stakeholders	Information sources	Process	Outputs
Laihonen, 2012	"Continuum of care and the effective knowledge transfer across organizational boundaries are necessities for productive health services." "In this paper, knowledge flows were seen as the enablers of self-organization, co-evolution and emergence of new order, and therefore it is argued that without efficient knowledge transfer processes the system cannot evolve and produce efficient and effective services." "Interconnectedness and interaction could be approached as knowledge transfer processes. Interaction is a key element of the complex system and therefore, by studying the concrete embodiments of interaction one could increase the understanding of the system."	√	√	√	
Chau et al., 2013	"In this case, while there were arguably knowledge flows among the various stakeholders, the principal facilitator of knowledge externalization (tacit-explicit) and combination (explicit-explicit) was the chief executive officer of the start-up company." "Identifying the principal process of the ecosystem as one of knowledge flow, we elucidate the roles of repository and networked knowledge, identify key consumers and producers in a trinity of communities of practice, and draw on knowledge management literature to describe different knowledge flows."	√	√	√	√
Silva et al., 2018	"A fundamental premise of open innovation is that inter-firm knowledge transfer can accelerate R&D. In industries where complexity and a diversity of capabilities, and specialized infrastructure are required to bring a solution to market, open innovation is touted as a business method where channels of external cooperation can be synergistic. Healthcare is such an industry."		√		√
Hopia et al., 2015	"Knowledge management systems present a new challenge in analysing and compiling the data on the health and activities of individuals for such information to be used personally by individuals, health professionals and public health monitoring authorities. Development of new guidance for patients, carers, families and patients' social environment on chronic disease management that is supported by mHealth is necessary." "According to the rationale of the Horizon 2020 (European Commission, 2013b) work programme, personalising health and care has been stated to empower citizens and patients to manage their own health and disease, which can result in more cost-effective healthcare systems by enabling the management of chronic diseases outside institutions, improving health outcomes, and by encouraging healthy citizens to remain so. Solutions should be developed and tested with the use of open innovation platforms, such as large-scale demonstrators for health and service innovation."	√			√
Allarakhia, 2015	"It is no longer sufficient for industry stakeholders to consider conventional therapies as the only mechanisms being sought after by patients. Without patient engagement, the industry risks being re-prioritized in terms of its role in the patient journey towards not only recovery of health, but also sustained health and wellness before disease onset." "In terms of leveraging the data, both quantitative analysis and natural language processing can be utilized by stakeholders for insight regarding drug re-design and ultimately holistic treatment platforms development to better meet patients' expectations." "Patient communities may be initiated by patients or by external stakeholders. In the case of patient-initiated communities, online forums and/or blogs, the patient is involved in a self-discovery process as to how best to manage disease conditions and associated symptoms. With the involvement of stakeholders from across the biopharmaceutical value chain, patients are likewise engaged in a process that extends beyond self-discovery to discovery, development, the management of treatments and conditions."	√	√		√

	"... as well as how patients engage a variety of stakeholders as part of disease management."				
Bullinger et al., 2012	"The approach of opening up traditionally closed innovation processes towards external actors and integrating their knowledge into the corporate innovation process has been coined by Chesbrough as open innovation: 'open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology'. Consequently, open innovation approaches can be clustered into three types of processes: inside-out, outside-in, and coupled. While inside-out processes involve strategies to commercialize internal knowledge, mainly by out-licensing technology, outside-in processes entail the acquisition of knowledge from a wide range of external sources, like suppliers, universities, and even competitors. Among the different external sources, today, especially customers or users are widely seen as an important source of innovation." "Building on results of the present study, empathic support in a community of patients and the public could be a new aspect in the treatment of rare diseases with a high psychological burden. A focus on social aspects might also offer interesting insights for innovation researchers as recent studies have pointed to the meaning of networks of social relationships within open innovation communities for knowledge transfer and innovation outcomes."	√	√		√
Mareeuw et al., 2015	"Different interviewees indicated that, as a result of the lack of interaction between knowledge users and knowledge producers, there appears to be an inadequate match between the supply of, and demand for, knowledge products (often research-based): passive knowledge transfer in the form of reports, databases, and websites is the most common form of implementation. Additionally, more implicit types of knowledge, such as experience-based knowledge, are often not made explicit." "The various actors produce or use knowledge in isolation from other actors (for example only regarding knowledge on their 'own' theme or only involving one type [scientific/practical/experiential] of knowledge). This lack of interaction may be explained by an overemphasis on the differences (distinct rationales, incentives, institutions) between different actor domains, a priori assuming that interaction is difficult or impossible, and implying that the distinction between domains is not changeable." "However, lately these views have been changing: there is a recognition of the multi-actor, systemic nature of innovation processes and the fact that there are multiple producers of useful knowledge beyond scientific knowledge. This is referred to as knowledge co-creation, a situation in which actors cooperate in order to combine different types of knowledge (cooperation results in jointly created knowledge). The identified underrepresentation or limited interpretation of the intermediary role may thus indicate a lack of facilitation of co-creation. Bodies of knowledge that may be combined in knowledge co-creation relate to, for example, traditional types of knowledge (such as scientific knowledge) and practice-based knowledge on how research-based knowledge functions in specific local contexts."	√		√	√
Savory and Fortune, 2015	"Within healthcare systems in Europe and North America, the structures to support development of new health technologies have focused on ensuring that new scientific knowledge is utilised effectively in clinical practice, either through development of new technologies or new clinical procedures. At the forefront of their efforts has been the development of translational research as an approach to structuring the health technology innovation process. At its heart, translational research which is a complex innovation pathway that combines knowledge transfer techniques, technical capabilities, intellectual property management and business partnerships, seeks to ensure that new knowledge is transferred rapidly from its source (traditionally the laboratory), to clinical practice."	√	√	√	√
Melder et al., 2015	"... the state government department responsible for a jurisdiction-wide initiative to transfer new redesign and improvement knowledge into the public healthcare system and their role as sponsors and funders of the attempt to transfer improvement knowledge. The department has promoted a decade-long programme to build capacity through a redesigning hospital care programme. To date, the programme has focused on building the skills of individual redesign and improvement advisors, and health services' improvement capability at the organisational level. In its most recent phase, it has sought to promote the sharing of knowledge and learning across health services."	√	√	√	
McKibbon et al., 2013	"The scope of knowledge translation (KT) includes 'knowledge dissemination, communication, technology transfer, ethical context, knowledge management, knowledge utilization, two-way exchange between researchers and those who apply knowledge, implementation research, technology assessment, synthesis of results within a global context, development of consensus guidelines and more.' The primary purpose of KT is to 'address the gap between what is known from	√	√	√	√

	research and implementation of this knowledge by key stakeholders'. The specific design of these KT activities is dependent on the type of research knowledge to be transmitted and the target audience."				
Nambisan et al., 2018	"The OI paradigm suggests that firms are increasingly sourcing knowledge and technologies from outside their boundaries (inflows) to accelerate internal innovation, while also searching for external markets to commercialize or monetize their internal knowledge assets and technologies (outflows) (Chesbrough, 2003, 2006). The OI framework is based on the notion that in a world of distributed knowledge, companies cannot rely solely on their own research and can benefit greatly from sharing their knowledge and innovating with partners. As our world becomes more connected, open innovation constitutes a mechanism for reducing research costs, spreading risks, and commercializing innovations more rapidly. The OI framework can be applied in many industry contexts, such as health care and IT, as well as in key public policy issues, such as academic entrepreneurship (Siegel & Wright, 2015), government innovation (Gascó, 2017; Mergel, 2018), and social innovation (Nambisan, 2009)."	√	√	√	√
Fernandes et al., 2017	"The process of developing an innovation may imply three types of approach: make; buy or cooperate with other agents to acquire specific competences or knowledge. The last occurs when the firms' internal knowledge or skill-base is not sufficient or effective and is conveniently complemented with external sources. Several studies on open innovation (OI) support that firm's boundaries require porosity in order to absorb knowledge and capabilities from the external environment. This can provide an extensive variety of ideas, opportunities, sharing of costs/risks and resources." "Firms' cooperation, among them or with clients or other stakeholders, and its potential for innovation is not new. The literature confirms that firms that do not co-operate, and do not formally or informally exchange knowledge, limit their long-term knowledge-base and, ultimately, reduce their ability to enter into exchange relationships."		√	√	√
Wass et al., 2016	"Results reveal that most studies focus on inbound open innovation where external knowledge is integrated with the internal knowledge base at an initial phase of the innovation process. Innovation primarily results in products and services through innovation networks. We also identified constraining factors for open innovation in healthcare, including the complex organizations of healthcare, the need to establish routines for capturing knowledge from patients and clinicians, regulations and healthcare data laws as well as the positive outcome patient empowerment."	√			√
Chatterji et al., 2014	"… knowledge transfer from physicians to firms, as opposed to collaborations focused on marketing and sales. In adopting this narrow lens, we likely understate the full value of users to the corporate innovation process. However, the benefit of this approach is that we can examine the impact of identifiable user knowledge contributions on firm innovative outcomes." "Taken together, our argument is that user knowledge, like other knowledge external to the firm, can enhance the ability of firms to generate innovations. The ideas conceived by product users spring from particular motivations, experience, and knowledge sets that are difficult for firms to replicate."		√	√	√
Loignon et al., 2018	"The solutions identified will be co-created with the knowledge and experience from peer researchers (community members), and the scientific evidence will be transferable to other similar contexts, including urban, rural and remote communities in industrialized countries with universal health systems. Thus, we plan to share the results, findings, and tools that evolve from the project through the engagement of patients, individuals, and communities."	√	√		√
Osei-Frimpong et al., 2018	"Patients increased participation in healthcare service delivery is considered critical of which, knowledge resulting from healthcare information seeking plays a cardinal role (Ayers and Kronenfeld, 2007, Fiksdal et al., 2014). Health-information seeking is defined as 'verbal and nonverbal messages ascertained via everyday interaction, either purposeful or serendipitous, by members in a self-defined network, that serve not only to reduce uncertainty regarding health status, but also to construct a social and personal (cognitive) sense of health' (Tardy and Hale, 1998, p. 338). This reflects in Payne et al.'s (2008) assertion that access to information, resources, individual knowledge and skills (competence), need assessment, and cognitive behaviours are some of the attributes to assist the patient to create value. Kellogg et al. (1997) assert that patients seek information for clarification purposes that enables them to satisfy their cognitive needs. Essentially, patients need information on healthcare to enhance their performance during clinical encounters as well as perform their tasks as value co-creators (Ayers and Kronenfeld, 2007, Chou and Chou, 2002, Yi and Gong, 2013)."		√	√	√
Oerle et al., 2016	"The extent to which a community member discloses personal information may determine the level of trust among community members (Ebner et al., 2009) and thus the creation and sharing of valuable knowledge (Ridings et al., 2002)."		√		√

	"In this view, an online health community is a knowledge-based, cooperative system of value creation that relies on multiple community components to coordinate participants' interactions. These four components (i.e. goals, activities, actors, interdependencies) feature inherent trade-offs and conflicts. First, the goal of the community can be oriented toward cognitive and/or affective value creation." "... patients share information with peers, who then process that information in light of their existing stock of knowledge. Through discussions of their interpretations in the online community, they create new knowledge (Bagozzi and Dholakia, 2002; Nonaka, 1994). Established social relationships with peers then provide trust and nurture future information sharing and knowledge creation (Ridings et al., 2002)."				
Zhao, Wang, and Fan, 2015	"According to the service-dominant logic, patients and health care providers are resource integrators who integrate operant resources (e.g. knowledge, skills) and operand resources (e.g. equipment, medicine, facilities, financial resources) to obtain their mutual benefits (Vargo and Akaka, 2009; Vargo and Lusch, 2008). These resources come from health care providers, public sources, the social networks in which patients are embedded, or patients' personal knowledge, experience, and skills (Vargo and Lusch, 2011)." "In online communities, knowledge sharing and knowledge co-creation occur among patients with similar concerns and experiences, and their behaviors are intentional and proactive (Frost and Massagli, 2008). Patients can also participate in service development in OHCs by providing innovative ideas, diffusing information about new medical services, and so on (Nambisan and Nambisan, 2009). Finally, in their daily lives, patients' value co-creation activities often involve collating information or combining complementary therapies (McColl-Kennedy et al., 2012)."		√		√
Kitson et al., 2013	"Whether the terms used are research utilization, knowledge transfer, knowledge mobilization, or knowledge utilization [9], they signify that purposeful activities have been undertaken to produce knowledge (information, evidence) with the intent that it can be applied with benefit to the real world." "These cover the need for an explicit theory-informed conceptual framework; formalizing collaborative approaches within the design; making explicit the roles of both the stakeholders and the researchers; and clarifying what counts as evidence. From our deliberations on these propositions, our own co-creating (co-KT) Framework emerged in which KT is defined as both a theoretical and practical framework for actioning the intent of researchers and communities to co-create, refine, implement and evaluate the impact of new knowledge that is sensitive to the context (values, norms and tacit knowledge) where it is generated and used. The co-KT Framework has five steps. These include initial contact and framing the issue; refining and testing knowledge; interpreting, contextualising and adapting knowledge to the local context; implementing and evaluating; and finally, the embedding and translating of new knowledge into practice."	√		√	√

The synthesis of scientific literature on knowledge transfer within and between open health communities underscores the necessity for a paradigm shift in conceptualizing models that facilitate this transfer. While the broader ecosystem approach has traditionally dominated attention in this domain, there is a growing recognition of the need for more nuanced models tailored specifically to the dynamics of health communities. Drawing inspiration from the concept of ecosystems in biology, where organisms interact and co-evolve within a shared environment competition (Jacobides et al., 2018), the proposed novel model for knowledge transfer within the open health communities seems to be crucial. This model would move beyond the traditional focus on the organizational boundaries and hierarchical structures, emphasizing instead the collaborative and dynamic nature of knowledge exchange within these communities.

In conclusion, the development of new models for knowledge transfer within and between open health communities holds significant promise for advancing both theoretical understanding and practical applications in this field. If embracing the dynamic and collaborative nature of health communities, it is possible to harness the collective wisdom and expertise of community members to drive continuous improvement in the healthcare delivery and outcomes.

1.2.2. Models of Knowledge Transfer

The history of knowledge transfer in the managerial sciences is a fascinating journey that reflects the evolving nature of organizations, their strategies, and the recognition of knowledge as a critical asset for success. Over the decades, the field has witnessed significant shifts in paradigms, theories, and practices related to the knowledge transfer (Sepúlveda & Alfaro, 2006; Gaviria-Marin, Merigó, & Baier-Fuentes, 2019). The effective transfer of knowledge stands as the main factor of organizational success, innovation, and competitiveness (Foss, Husted, & Michailova, 2010; Noruzi et al., 2018). Knowledge transfer models provide valuable frameworks that enhance the mechanisms through which knowledge is shared, disseminated, and applied within and across the organizations. These models offer insights into how information is harnessed, transformed, and utilized to drive informed decision-making, arise problem-solving capabilities, and foster collaborative learning environments. The scientific literature of managerial sciences has a diverse array of knowledge transfer models, each tailored to capture the distinct facets of complex knowledge exchange processes that are inherent to the organizational dynamics. These models not only show the interplay between tacit and explicit knowledge but as well uncover the social, cognitive, and structural factors that underpin successful knowledge transfer. These models offer multifaceted perspectives on the mechanisms that facilitate the movement of knowledge, ideas, and expertise among individuals, teams, and organizations. On this journey through the landscape of knowledge transfer models, the foundational principles, conceptual underpinnings, and practical implications that each model contributes to the advancement of managerial sciences have been uncovered.

Knowledge transfer models have historically been more prominently used and studied in business and other sectors compared to the medical sector. This situation can be attributed to a variety of factors, including the nature of industries, the level of formalization and documentation, and the emphasis on the organizational learning and innovation in business contexts.

In the business sector, knowledge transfer is a key driver of innovation, competitiveness, and operational efficiency. The organizations strive to leverage the expertise and insights of their employees, partners, and stakeholders to enhance the processes, develop new products, and stay ahead in the dynamic markets. The concepts of knowledge management, best practice sharing, and organizational learning are deeply ingrained in business practices. Conversely, the medical sector, particularly clinical practice and healthcare institutions, has traditionally operated within a framework that values standardized protocols, evidence-based medicine, and patient safety. While medical research and advancements are integral to the field, the emphasis on the individual patient care and adherence to the established protocols have sometimes led to a slower adoption of knowledge transfer practices.

The most popular model for the knowledge creation, the SECI model, proposed by Nonaka and Takeuchi in 1995, emphasizes the transformation of knowledge through socialization, externalization, combination, and internalization processes (Nonaka & Takeuchi, 1995). It focuses on the interplay between the tacit and explicit knowledge within the organizations. This model collectively enriches the understanding of the intricate processes that drive organizational learning and growth. In order to create successful health knowledge, all of the SECI model elements need to be facilitated (Nonaka & Takeuchi, 1995). This model is selected as the primary framework to explore the transfer of tacit and explicit knowledge, as well as knowledge exchange among the community participants, owing to its adaptable components.

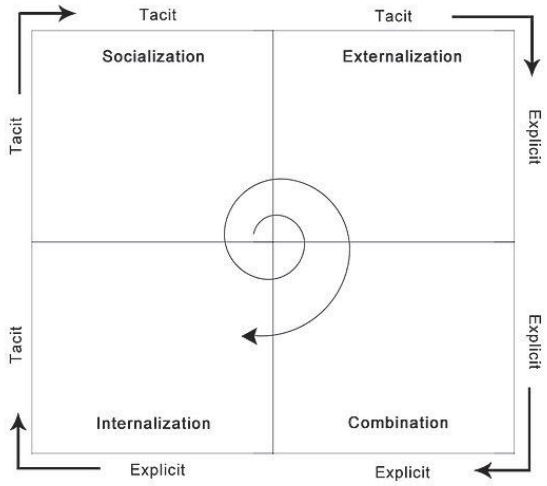


Figure 8. Visual presentation of the SECI model of Nonaka and Takeuchi (1995)

The premise that knowledge results from the interplay between the tacit and explicit knowledge leads to identifying four distinct modes of knowledge conversion: socialization, externalization, combination, and internalization. These modes encapsulate the dynamic processes by which knowledge undergoes transformation and transfer (Nonaka & Takeuchi, 1995). The objective is to reverse the process of explicit knowledge within the model and transform it back into the tacit knowledge possessed by the employees (Laihonen et al., 2012):

1. Socialization (tacit to tacit) involves the exchange of knowledge through mechanisms, such as observation, imitation, and hands-on experience, often facilitated by mentorship or apprenticeship. This mode underscores the significance of physical proximity and direct interaction as effective means of acquiring tacit knowledge. Socialization is rooted in shared experiences, and the interactions both within and outside the organization contribute to its manifestation. Brainstorming with colleagues or engaging directly with customers exemplifies this mode of knowledge transfer, where tacit knowledge is conveyed through communal activities.
2. Externalization (tacit to explicit) entails the conversion of tacit knowledge into explicit form, rendering it accessible and interpretable by the others. This mode crystallizes individual tacit knowledge into tangible expressions that can be shared and comprehended. The act of externalization transforms concepts, images, and textual documentation into vehicles for knowledge dissemination. This mode serves as a bridge between the internal cognitive realm and the realm of shared explicit knowledge, facilitating its transmission and uptake.
3. Combination (explicit to explicit) encompasses the amalgamation and integration of various explicit knowledge elements. This mode involves the organization and merging of distinct explicit knowledge sources, often facilitated by the digital communication networks and extensive databases. The explicit knowledge is collated through this process from internal or external sources, subjected to the synthesis and refinement, and subsequently distributed within the organizational ecosystem. Combination serves as a mechanism for knowledge enrichment by synthesizing diverse explicit inputs.
4. Internalization (explicit to tacit) involves the absorption and application of explicit knowledge by an individual, typically through experiential learning. In this mode, external explicit knowledge becomes assimilated into an individual's cognitive repertoire, contributing to the personal knowledge and organizational assets. Internalization is propelled by iterative individual and collective reflection, fostering the ability to discern patterns, connections, and meaningful relationships among disparate fields and concepts.

Moreover, the existence of these four modes enhances the interplay between tacit and explicit knowledge, thereby strengthening the trajectory of the spiral. These four modes of knowledge conversion collectively constitute a cyclical pattern referred

to as the spiral of knowledge creation. This spiral is characterized by the continual progression through these modes, resulting in a dynamic and evolving process of knowledge generation (Nonaka & Takeuchi, 1995). Additionally, Nonaka and Konno introduced the concept of 'Ba,' a Japanese term denoting shared spaces or contexts where knowledge is generated, shared, and employed. This notion encompasses physical, virtual, and mental spaces, further enriching the understanding of the intricate interplay between knowledge, context, and interaction (Nonaka & Konno, 1998). The four aforementioned modes of knowledge conversion collectively give rise to a dynamic spiral of knowledge creation. As knowledge creation is inherently an ongoing process, this spiral perpetually unfolds through the progression of these four modes of knowledge conversion (Nonaka, Toyama, & Konno, 2000). In essence, the SECI model, supplemented by the concept of 'Ba,' encapsulates a comprehensive framework that elucidates the multifaceted dynamics of knowledge transfer, creation, and utilization within the organizations. It underscores the interwoven nature of tacit and explicit knowledge and provides a roadmap for harnessing these distinct forms to drive organizational learning, innovation, and success. Even the SECI model, proposed by Nonaka and Takeuchi, has faced criticism since its introduction. While it has been widely influential in understanding knowledge creation and transfer, some scholars have raised critical points and limitations (Tsoukas & Vladimirou, 2001; Tsoukas, 2002; Chua & Lam, 2005; Gourlay, 2006; Easterby-Smith, Lyles, & Tsang, 2008; Leonard & Sensiper, 2011). Critics argue that the SECI model places excessive emphasis on tacit knowledge and its transformation, sometimes neglecting the importance of explicit knowledge in certain contexts. This imbalance can lead to an incomplete understanding of knowledge processes (Tsoukas, 2002). Some critics argue that the SECI model oversimplifies the complex dynamics of knowledge creation and transfer. The real-world knowledge processes are often much more intricate and multifaceted than the model suggests (Easterby-Smith, Lyles, & Tsang, 2008). The discussed applicability of the SECI model might be limited in different cultural and contextual settings (Gourlay, 2006). Moreover, it has been pointed out that the model lacks a clear and detailed methodology for implementing its processes. This can make it challenging for practitioners to translate the model's concepts into actionable strategies (Chua & Lam, 2005). Thus, it is important to note that while these criticisms exist, the SECI model has as well contributed significantly to the understanding of knowledge processes and has been widely used as a foundation for further research and discussions in the field of knowledge management. The significance of context, the methods employed for knowledge conversion, and the influence of knowing communities when examining the connections between tacit and codified knowledge are highly important (Ancori, Bureth, & Cohendet, 2000). Thus, the SECI model's applicability and relevance can vary based on the specific context and objectives of the organization.

Another popular model was introduced by Szulanski in 2000 and is called Knowledge Transfer Framework (KTF). The model provides insights into how firms transfer knowledge within their organizations. It considers factors, such as knowledge complexity, recipient absorptive capacity, and sender-receiver relationship. The

model showed distinct phases of knowledge transfer and its factors anticipated to exhibit associations with challenges encountered at various transfer stages. Knowledge retention is formulated for each transfer phase, thereby facilitating the exploration of varying prognostic efficacy of disparate factors across the sequential stages of the transfer process (Szulanski, 2000). It seeks to enlighten on the intricate mechanisms through which knowledge flows within the organizations, impacting their overall effectiveness, innovation capabilities, and competitive advantage.

The initial phase establishes the roles of knowledge carriers and receivers within the organizational context. Collaborative planning among relevant stakeholders is pivotal at this stage to minimize uncertainty and ambiguity. As the process transitions to the implementation phase, knowledge carriers and receivers engage in the exchange of information resources and artifacts according to the established plan and interaction guidelines developed in the initiation phase (Szulansky, 2000; Voigt, Novak, & Schwabe, 2007). Upon the successful culmination of the implementation phase, the process advances to the ramp-up phase. At this crucial stage, the active application of acquired knowledge by the receiver becomes imperative (Szulansky, 2000).

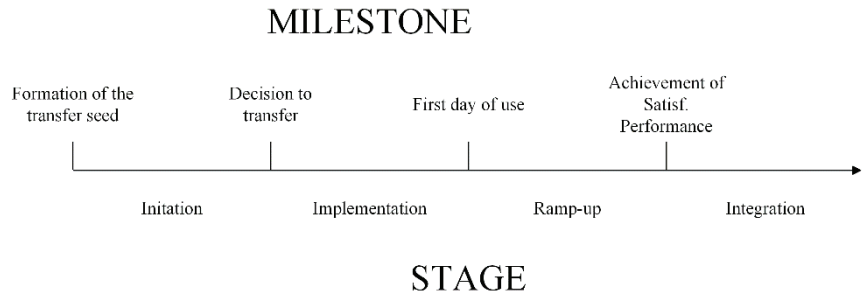


Figure 9. Visual presentation of Szulanski's general knowledge transfer model (2000)

The knowledge receiver gradually assumes tasks that were previously handled by the knowledge carrier, gradually assuming full responsibility for the outcomes linked to the transferred knowledge. In the integration phase, knowledge begins to spread from the recipient to their peers. Furthermore, any new knowledge acquired during the ramp-up phase adds to the existing repository of artifacts created during implementation (Szulansky, 2000; Voigt, Novak, & Schwabe, 2007). The critics might argue that the four-phase process that has been outlined in the model oversimplifies the complex and multifaceted nature of knowledge transfer within the organizations. Real-world knowledge transfer can involve a multitude of variables and contextual factors that may not neatly fit into a linear framework.

Wenger's community of practice (CoP) model stands as a substantial and influential framework that prominently underscores the social dimensions inherent to the processes of learning and knowledge transfer within the organizational contexts (Wenger & Snyder, 2002). The CoP model engrosses itself in the intricate interplay

between individuals' collaborative endeavours, the dissemination of expertise, and the synergistic accumulation of insights. This is particularly nurtured within the distinct realms of communities, where individuals congregating within the shared ambit of common interests, practices, and objectives partake in a collective journey of knowledge enhancement and exchange (Li et al., 2009). The CoP concept was initially developed as a framework to explore the learning that unfolds among practitioners within a social context. However, over time, notable shifts in the concept's emphasis have transpired. In Lave and Wenger's earliest publication in 1991 (Lave & Wenger, 1991), the focal point revolved around the interactions between individuals at different expertise levels, particularly novices and experts. The primary concern was the process through which newcomers construct their professional identities (Li et al., 2009). Wenger (1998) changed the concept's focus, which underwent a transformation, shifting towards the individual's personal development journey and the trajectory of their participation within a group. Identity and autonomy are indispensable for the agent to establish their distinctiveness within their environment and the community members to act collectively (Cohendet, Créplet, & Dupouët, 2001). This shift encompassed the distinction between the peripheral and core participation levels. Subsequently, another transformation occurred in 2002 when the CoP concept was leveraged as a managerial tool to enhance an organization's competitive edge (Wenger & Snyder, 2002). This marked a departure from its original focus on individual learning dynamics to a strategic implementation aimed at organizational improvement (Richardson & Cooper, 2003; Li et al., 2009). In conclusion, Wenger's community of practice model highlights the role of social interactions, shared experiences, and mutual learning in knowledge transfer. It provides a powerful framework for understanding how knowledge is exchanged, developed, and applied within groups of individuals who share common interests and goals. Moreover, this model serves as an initial step towards the integration of knowledge management and knowledge transfer within the medical sector. If embracing the principles and frameworks underlying this model, the medical field can pave the way for effective practices in harnessing, sharing, and disseminating knowledge. As healthcare becomes increasingly complex and multidisciplinary, this model can bridge gaps, foster interdisciplinary communication, and ultimately contribute to better patient outcomes.

After exploring these models and their contributions, it is possible to gain valuable insights into how organizations can strategically leverage knowledge transfer to fuel innovation, enhance problem-solving capabilities, and fortify their competitive advantage. As the nuances and intricacies of these knowledge transfer models are navigated, a tapestry of strategies, tactics, and frameworks that not only inform scholarly discourse but as well hold the potential to catalyse real-world organizational transformations is uncovered. However, it is important to acknowledge that the medical sector has its unique challenges, such as stringent regulations, ethical considerations, and the need for accuracy. After recognizing the distinctive characteristics of medical knowledge, patient care pathways, and the evolving nature of medical science, the need for a model, which can serve as a catalyst for informed

decision-making, continuous learning, and transformative healthcare practices within the healthcare community, is highly desired.

Szulanski's knowledge transfer model and Wenger's communities of practice model might not be suitable for the specific context of knowledge transfer in open health communities. Szulanski's model focuses on the mechanisms and barriers involved in transferring explicit knowledge within organizations. It is primarily concerned with factors, such as knowledge codifiability, similarity, and transferability. While this model may be applicable in some organizational contexts where explicit knowledge transfer is the primary concern, it may not fully capture the complexity of knowledge transfer processes in open health communities. These communities often deal with both explicit and tacit knowledge, and the social aspects of knowledge sharing are equally, if not more, important than codifiability. Wenger's framework emphasizes the social aspects of learning and knowledge creation within the communities. The communities of practice are formed by people who engage in shared activities and develop a shared repertoire of resources, experiences, and ways of addressing common problems. While this framework could be highly relevant to the understanding of dynamics within the open health communities, it focuses more on the formation and sustenance of communities rather than the specific processes of knowledge transfer. Therefore, while it provides valuable insights into community building and learning, it might not offer as detailed framework for understanding the mechanisms of knowledge transfer itself.

In contrast, the SECI model offers a more comprehensive framework that explicitly addresses both the social and cognitive processes involved in knowledge creation and transfer. Its focus on tacit and explicit knowledge conversion, along with its iterative nature, makes it particularly well-suited for understanding the dynamics of knowledge transfer within the open health communities. Health communities deal with a blend of tacit knowledge (personal insights, experiences) and explicit knowledge (data, guidelines). The SECI model helps in understanding how these different forms of knowledge are created and transferred among community members. Open health communities rely on the effective knowledge sharing to foster innovation, improve practices, and solve complex problems. The SECI model provides a structured approach to facilitate this sharing process by outlining different pathways for converting and transferring knowledge. The SECI model's iterative nature allows communities to adapt and evolve over time by continuously generating, sharing, and internalizing new knowledge. The SECI model serves as a valuable background for exploring knowledge transfer in open health communities because it provides a comprehensive framework for understanding the dynamics of knowledge creation, sharing, and utilization within collaborative settings. The communities can enhance their capacity for innovation, problem-solving, and collective learning by leveraging the SECI model, ultimately contributing to the improved health outcomes and patient care.

The SECI model serves as a foundational framework in this dissertation for comprehensively elucidating knowledge transfer and related concepts within the open

health communities. Its application involves rigorous analysis with specific segments integrated into the proposed model that is delineated within the dissertation.

In summary, it is important to note that the medical sector has recognized the significance of knowledge transfer in recent years. As medical research, technology, and treatment options continue to evolve rapidly, the healthcare professionals are increasingly acknowledging the need to share and transfer knowledge effectively to ensure the best practices, improve patient outcomes, and keep up with the latest advancements. The efforts to bridge the gap between knowledge transfer models used in business sectors and the medical sector are underway. Health informatics, telemedicine, and interdisciplinary collaborations are becoming more common, enabling medical professionals to access and exchange knowledge more efficiently. Additionally, healthcare institutions are placing a greater emphasis on continuous learning, professional development, and evidence-based practices. In conclusion, while knowledge transfer models have been more prevalent in business and other sectors, the medical sector is gradually recognizing their importance and incorporating them into its practices. As the field continues to evolve and adapt to the changing landscape of healthcare, knowledge transfer will likely play an increasingly significant role in driving improvements in patient care, medical research, and overall healthcare outcomes.

The theoretical underpinnings of knowledge transfer in open health communities lay the groundwork for understanding the dynamics and mechanisms that govern information exchange within these communities. This chapter delved into the theoretical frameworks that inform the study, providing a conceptual lens through which the subsequent empirical investigation unfolds.

This section explored the concept of the social construction of knowledge, emphasizing how knowledge within the open health communities is collectively shaped and shared. It examines the role of community interactions and collaborations in the formation and dissemination of health-related information. Community engagement in knowledge transfer processes shows how active participation, collaboration, and shared experiences within the open health communities contribute to the transfer of health-related knowledge and influence knowledge transfer within the open health communities, providing a lens through which to analyse the unique aspects of health information exchange.

This chapter is synthesizing the explored theoretical foundations, highlighting the key concepts and frameworks that will guide the subsequent empirical investigation. It sets the stage for the application of these theories in understanding the intricacies of knowledge transfer within the open health communities, specifically tailored to the context of women's health.

Nevertheless, a significant gap in the definition of knowledge transfer in open health communities is evident. The identified gap stands as the rationale for further empirical qualitative multiple-case research:

1. The concept of a health community is defined as a reservoir of the existing health knowledge aimed at supporting community members in addressing specific

health issues through the sharing of existing knowledge and the potential co-creation and transfer of new knowledge for the healthcare improvement. Health communities can be categorized into direct and online communities. Direct health communities involve face-to-face collaboration among known actors or stakeholders, while online health communities serve as a convenient and popular source for obtaining health information and sharing knowledge anonymously. Thus, different communities face contextual differences: direct and online health communities operate within distinct contexts. Studying direct health communities allows for an in-depth understanding of face-to-face collaboration among known actors or stakeholders in a physical setting. However, online health communities offer a convenient and popular platform for obtaining health information and engaging in anonymous knowledge sharing. Exploring the differences between these two types of communities empirically should provide valuable insights into how different contextual factors influence knowledge transfer processes and outcomes.

2. Knowledge transfer within health communities is based on distinct components: informational sources, knowledge transfer activities and components of the SECI model (Socialization, Externalization, Combination, and Internalization), facilitators of knowledge transfer, and influence on innovation. Empirical research allows for the customization of knowledge transfer strategies to suit the specific context, increasing the success and resolving the asymmetries and misunderstandings.

It is crucial to clarify that the needs of the communities define the ultimate goals and continuously coordinate the process. The further focus of the qualitative research is to collect and systemize empirical data. Moreover, qualitative research in this context extends its purview to encompass the systematic acquisition and organization of empirical data with the express aim of constructing a knowledge transfer model. This model serves as a catalyst for facilitating co-creative innovation within the open health communities. The research contributes to the environment where collaborative and innovative practices thrive by enhancing the transfer of knowledge within these communities.

This research endeavours to enhance the collaborative potential and creative capacities of open health communities through a systematic approach to data collection and the development of a knowledge transfer model.

2. METHODOLOGY FOR THE RESEARCH OF KNOWLEDGE TRANSFER IN OPEN HEALTH COMMUNITIES

The aim of this chapter is to explain the original methodology and philosophical orientation of the research. It encompasses a discussion of the philosophical principles, the selection of the research methodology, the research design, and the methods employed for the data collection and analysis.

2.1. Philosophical Orientation of the Research

2.1.1. Research Aim and Research Questions

The object of the research – the implementation of knowledge transfer processes in the open health communities.

The aim of the research – to explain how knowledge transfer should be organized and enabled in open health communities in order to achieve community-driven innovation.

Research aim is distributed among the following research questions:

RQ1: How knowledge managementis organized in open health communities, given the diversity of information sources?

RQ2: How the application of knowledge management theory can improve knowledge management and particularly transfer processes within the open health communities?

RQ3: What are the critical enablers for knowledge management in open health communities?

In order to achieve the aim, the following **research objectives** have been set:

1. To conceptualize the role of open health communities in knowledge transfer process;
2. To ground the conceptual relationship between health community openness and knowledge transfer process within;
3. To develop a research methodology for the analysis of knowledge transfer process and its enablers in open health communities;
4. To empirically define knowledge transfer process peculiarities in open health communities and reveal critical enabling factors for successful knowledge circulation and co-creation;
5. To develop an empirically grounded model to facilitate knowledge transfer process within the open health communities.

The research aims to provide insights into the implementation of knowledge transfer within the open health communities with a focus on explaining how this process is organized and enabled. The following methodological approach is designed to address the specific objectives of the study:

1. Conceptualization of open health communities: a literature review and content analysis were conducted to understand the functions and roles of open health communities in knowledge transfer. The data sources, including

scholarly articles, community discussions, and organizational documents, were examined to extract the key conceptual elements.

2. Grounding conceptual relationships: the study employed a conceptual analysis method to establish the relationships between health communities, their openness, and knowledge transfer with a specific focus on innovation inputs. The analysis involved the assessments and synthesis of existing theories and models, contributing to the development of a conceptual framework.
3. Research methodology development: a research methodology was developed to qualitatively analyse the knowledge transfer mechanisms within the open health communities. The design of interview protocols was included, and the observation techniques were tailored to capture the nuances of knowledge transfer in open health community settings.
4. Empirical examination of knowledge transfer mechanisms in open health communities: the empirical data collection was conducted through interviews to identify formative processes, enabling factors, and barriers influencing knowledge transfer. Qualitative data analysis, including thematic coding and pattern recognition, was employed to collect insights from the empirical data.
5. Empirically grounded model development: the study results in the development of an empirically grounded model to facilitate knowledge transfer within the open health communities. The model was constructed based on the findings from the empirical examination, integrating practical insights from the study's data.

The research endeavours to systematically address each objective, ultimately contributing to a nuanced understanding of knowledge transfer in open health communities by implementing this methodological framework.

2.1.2. Ontology and Epistemology of the Research

The research objective emerged following a thorough theoretical analysis, revealing the underlying philosophical framework guiding this study. Additionally, the study's ontological and epistemological stance shapes its research design with both of these aspects being integral components of the philosophy of knowledge. The researcher's values and beliefs determine the choice of the research design and research methodology to reveal a specific research question and have an impact on the findings of the research work (Moon & Blackman, 2014; Žydžiūnaitė & Sabaliauskas, 2017). The philosophical orientation of this study is *social constructivism*, the ontological and epistemological paradigm about the collaborative dimension of learning, asserting that knowledge evolves through interpersonal interactions, cultural influences, and broader societal context. Learning from peers and mentors helps to construct individual understanding of the world (McKinley, 2015). This research is guided by interpretivist epistemology and constructivist ontology.

Interpretivism is a philosophical stance that contends that knowledge is not objectively determined but is rather socially constructed. This perspective directs attention to the exploration of specific phenomena within well-defined contexts and timeframes. The central objective of interpretivism is to delve into the subjective aspects of human experiences, aiming to uncover the underlying motives, meanings, reasons, and other nuanced elements that contribute to the construction of knowledge (Hudson & Ozanne, 1988). In contrast to positivism, which emphasizes an objective and detached observation of reality, interpretivism embraces the idea that understanding is context-dependent and shaped by the interactions and interpretations of individuals within their social and cultural environment. This philosophical approach acknowledges the complexity of human experiences and seeks to capture the richness of meanings embedded in the social construction of knowledge.

Ontology pertains to how the researcher perceives the nature of reality and defines the research framework (Hudson & Ozanne, 1988; Žydžiūnaitė & Sabaliauskas, 2017). *Constructivism*, as an ontological approach, encourages researchers to engage in self-reflection regarding the underlying paradigms that may be shaping their research. In doing this, they should be more receptive to alternative interpretations of their research findings. Moreover, the emphasis lies in presenting results as flexible models that are open to negotiation, rather than attempting to precisely depict social realities (Crotty, 1998; Creswell et al., 2012). During this study, while analysing the actions of health communities as they evolve, the concept of reality is perceived as distinct, dynamic, and phenomenological. During the research process, the factors such as timeframe, context, and cultural elements hold significant importance. As a result, the obtained findings reveal the behaviours and challenges faced by the actors during the research.

Epistemology is concerned with the connection between the researcher and the phenomenon under investigation and determines the research questions (Carson et al., 2001; Žydžiūnaitė & Sabaliauskas, 2017). *Interpretivism,* as an epistemological approach, is based on the researcher's provision that knowledge is generated without a distinct separation from the subject or object; it is an integrated and interconnected process (Easterby-Smith et al., 2018). In the role of a researcher for this study, the author of the dissertation recognizes the interdependence between researchers, informants, and the research context. The research philosophy intricately influences the interpretation of results, the analytical process, and the framework created for the study (Creswell et al., 2012). During this study, the primary focus is on examining the precise mechanisms and underlying reasons for the observed behaviours within the health community members under investigation.

Axiology states the value of this research (Žydžiūnaitė & Sabaliauskas, 2017), which is to analyse and understand the social phenomenon in order to contribute to the scientific knowledge, theory creation, and improvement of public health. While conducting the research, the author is a part of the researched environment, and the possibility of subjectivity remains. However, the author does understand possible mistakes and based on academic traditions and experiences, admits understanding that she is not separated from the surrounding environment. The research findings undergo

validation by the scientific supervisor, scientific consultant, peer reviewers, and other researchers, ensuring that potential errors are rigorously addressed and minimized. The significance of this study, from the perspective of a researcher, lies in understanding and explaining the pertinent phenomenon, thereby enriching the corpus of scientific knowledge and theory and facilitating their practical implementation in societal contexts.

2.2. Research Design

The logic of the dissertation research process

The research starts with the *Development of Research Idea*. The idea of the selected topic was born as a part of the cluster project titled "Development of Health Innovations in Holistic Communities: Creation of Open Educational Environments for Knowledge Integration (cHICOLab)", which involved a collaboration between three universities: Kaunas University of Technology, Lithuanian University of Health Sciences, and Vytautas Magnus University. The primary objective of this research was to gain an understanding of the complex nature of knowledge flows within the health ecosystem. The study focused on collecting and mapping knowledge flows as well as identifying the prerequisites for knowledge exchanges and co-creation. During this project, the idea of the topic of the dissertation was developed in order to broaden the exploration of open health communities and fill the revealed gap in managerial sciences. In the *Specification of the Research Context*, the scope of the research, including the specific context, was planned. The main factors, such as time frame, l location, target population, and other relevant contextual elements, were considered. The primary plan of the study and research were made. The reviewing of relevant theories, models, and frameworks that provide a theoretical basis for the research was made for *Theoretical Substantiation*. The existing literature was reviewed to understand the current state of knowledge and identify any existing theories or frameworks that are relevant to the research idea. During this period, the key concepts and relationships, the selection of theoretical perspectives based on their relevance were explored. In the stage of *Development of Conceptual Framework*, the theoretical perspectives into a coherent conceptual framework were synthesized. The key constructs and their interrelationships within the framework were defined. The conceptual framework and conceptual maps were illustrated visually. In the next step, *Substantiation of Research Methodology*, qualitative research methodology was selected based on the research questions and objectives. Chosen methodology was justified in terms of its suitability for addressing the research aims and objectives. The data collection methods, sampling techniques, and data analysis procedures that will be used in the study were described.

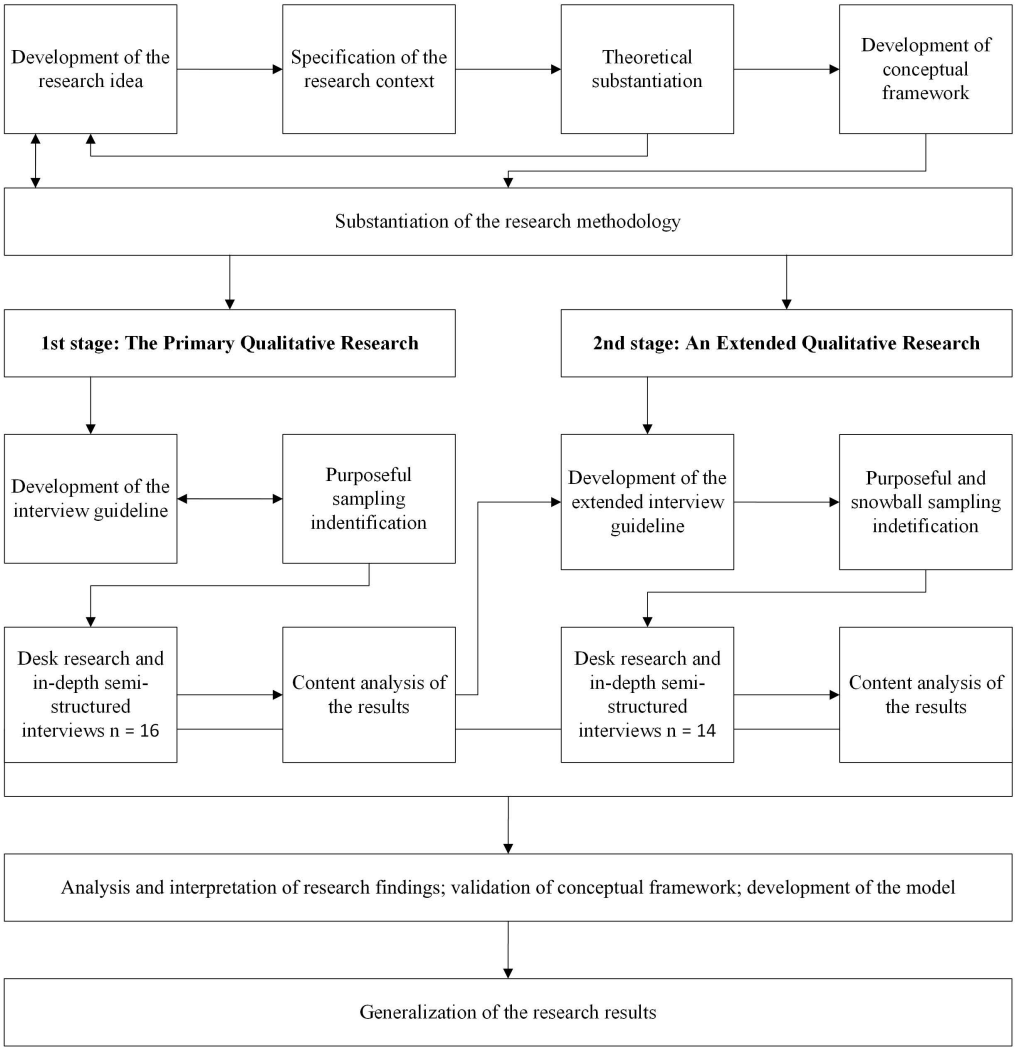


Figure 10. Visual presentation of the methodological logic in the dissertation research

Primary Qualitative Research was started to conduct data (via semi-structured interviews) to gather primary qualitative data. Ethical guidelines were ensured. All the interviews were recorded and transcribed for further analysis. *Extended Qualitative Research* was started in order to enrich and ensure sufficient data saturation and depth of understanding. The data were conducted via semi-structured interviews, recorded, and transcribed. The ethical guidelines were followed. The secondary data from multiple sources to enhance the credibility and trustworthiness of the findings were made. There was made a continuous reflection on the research process and the necessary adjustments to the research design. *Analysis and Interpretation of Research Finding* were made to analyse qualitative data using thematic analysis. The findings in relation to the research questions and theoretical framework were interpreted. Patterns, themes, topics within the data were identified, and their implications for theory and practice were explored. The validation of

conceptual framework required to evaluate the consistency and coherence of the conceptual framework in light of the research findings. The feedback from the peers and experts were collected in order to validate the conceptual framework and ensure its robustness. In order to refine and finalize the conceptual framework into a formal model that represents the main constructs and relationships, the stage of *Development of the Model* was made. The components of the model and their interconnections were defined; the potential extensions or modifications to the model based on the research findings and insights were considered. *Generalization of the Research Results* was required to consider how the results contribute to the theory development, practical applications, or policy recommendations, reflect on the broader implications of the research findings beyond the specific context of the study and discuss the limitations of the study and suggest avenues for the future research.

2.2.1. The Context of the Research

Open health communities, defined as communities that are purposefully created for the specific health issues and use internal and external knowledge to co-create community-driven innovation by their collaborative and participatory nature, present a distinct and dynamic platform for individuals to partake in discussions, exchange experiences, and share valuable insights concerning health and well-being. These communities serve as hubs for diverse perspectives and expertise, nurturing a collective intelligence capable of fostering innovative advancements in healthcare practices.

The research idea originated within the collaborative project "cHICO LAB" involving three Lithuanian universities (KTU-LSMU-VDU). The primary goal of this project was to gather the open health community and explore its fundamental operational principles. In this project, the idea for the research continuity was raised, and the topic of the thesis emerged. As the dissertation took form, the decision was made to uphold the foundational principles of women's health research and extend the investigation into a broader scope, encompassing women's health across their entire lifespan. This expansion not only broadened the pool of research participants but widened the scope of the research field as well.

The study is centred around the women's health throughout various stages of their life cycle, addressing the wide scope of health issues that women may encounter. Women's health is a multifaceted topic encompassing physical, mental, and social dimensions. Across different life stages, women face unique health challenges, ranging from reproductive health concerns, such as menstruation, pregnancy, and menopause to chronic illnesses, mental health issues, and age-related health conditions. Understanding and addressing women's health within the life cycle is vital for enhancing the overall well-being and advancing healthcare outcomes. This study aims to shed light on the factors influencing women's health and pinpoint strategies for effective prevention, intervention, and healthcare delivery by examining the distinct health requirements and experiences of women at different life stages. The life cycle perspective enables an exploration of women's health, considering not only the physiological changes but social, cultural, and environmental factors shaping

women's experiences as well. Acknowledging the interconnection of these elements, the study aims to contribute to women's health within the framework of open health communities.

Highlighting the intentional focus on women as the exclusive research area and the purposeful exclusion of men is a critical aspect of this study. This deliberate limitation in scope, while offering specific insights, inherently restricts the diversity of perspectives considered in the research. Recognizing this limitation, future developments in the research should prioritize the integration of male participants. This intentional inclusion of male perspectives would aim to broaden the scope and enhance the diversity of insights, fostering a more comprehensive and inclusive understanding of knowledge transfer within the open health communities. Due to the incorporation of diverse voices, the research can capture the complexities of knowledge exchange dynamics better, ensuring that findings are reflective of a broader spectrum of experiences and contributing to a more robust body of knowledge in the field.

The dissertation's unique study period from 2018 to 2023 is as well marked by the unprecedented impact of the COVID-19 pandemic, which disrupted and significantly changed the reality of the open health communities, as well as the initially planned research trajectory. Originally designed to focus only on direct open health communities, the onset of the pandemic in 2019 necessitated a re-evaluation of the research plans. As the global community grappled with lockdowns and shifted to virtual spaces, the research had to include online health communities. During the pandemic, online health communities experienced an extraordinary surge in growth. The pandemic intensified the need for information and answers to emerging health questions, prompting a rapid increase in the popularity of online health communities. This surge facilitated communication across distant countries, expanding opportunities for interaction and significantly amplifying the flow of health-related information. The unforeseen circumstances of the pandemic compelled the study to adapt, leading to the inclusion of online open health communities in the research. At first, it was seen as research limiting factor, but this adjustment proved to be an enriching factor, allowing for a more comprehensive exploration of the evolving landscape of health communities during a time of global crisis. The inclusion of virtual spaces in the study not only reflects the adaptability of the research design but as well captures the dynamic nature of health-related interactions in the digital age, showcasing the resilience and transformative potential of open health communities in response to unprecedented challenges.

The research seeks to be a catalyst for positive change by providing actionable insights that can guide the design and implementation of strategies aimed at addressing the unique health needs of women in diverse community settings. Research methodology includes the overall research design and systematic planning of how the research will be conducted, relates to the chosen philosophical approach, and includes the systematic process and principles of knowledge creation (Chowdhury, 2019). The dissertation research process, as outlined by Dudovskiy (2018), follows a structured sequence:

- Selection of the research idea and topic;
- Formulation of research objectives and questions;
- Theoretical literature review and identification of research gaps;
- Selection of research methodology;
- Empirical research data collection, processing, analysis, and interpretation;
- Theoretical development and conclusions;
- Theorizing and creating a model;
- Drawing practical recommendations;
- Determining directions for further research.

This structured process guides the dissertation research, allowing for a comprehensive and systematic investigation while as well contributing to the advancement of scientific knowledge in the field. The methodology of this study was created after analysing other studies based on the theory of knowledge management. Undertaking an in-depth exploration of open health communities and their innovative potential, the study aims to contribute to the scientific understanding of these communities and provide practical insights for healthcare practitioners or managers, policymakers, and researchers. The methodological approaches were synchronized by combining health communities, knowledge transfer, and open innovation approaches. The systematization of scientific literature, research and good international practices, and systematic analysis have been carried out to theoretically model the principles of operation of health communities, enabling the integration of diversified knowledge focused on the generation of innovative solutions to health challenges. The concept of open health communities is based on the principles of integrating diversified knowledge to address the health challenges. The main principles of the study are applied in the theoretical modelling.

In order to unveil the phenomenon under investigation in the dissertation, the research begins by conducting a conceptual analysis of relevant literature. Initially, the study delves into the exploration of open health communities, dissecting their typology and the role of community openness within the healthcare system. Subsequently, the focus shifts towards the conceptualization of knowledge transfer, exploring its application within the open health communities and examining the pre-existing models associated with the management of knowledge.

A systematic literature review was included to further enrich the comprehensive conceptual analysis. This addition was intended to reveal the depth of information, particularly focusing on establishing connections between health communities and the process of knowledge transfer. After synthesizing the existing literature in the field, the aim was to strengthen the understanding of how health communities facilitate and impact the transfer of knowledge within the healthcare domain.

The analysis of theoretical literature involves an examination of scientific articles sourced from reputable scholarly databases, such as Web of Science, PubMed, and Scopus. The emphasis is placed on delving into conceptual and literary analysis articles as well as empirical studies that align with the context of the dissertation topic. This selection process aims to focus on scholarly works that specifically contribute to

the understanding of the subject matter, thereby ensuring a comprehensive and relevant exploration of the research topic. Theoretical literature analysis was enriched with classical management theories, models, and other scientific sources. They were thoroughly examined, encompassing content from books, book chapters, and various scientific literature. This approach allowed for a thorough examination of established theories and models, alongside an exploration of diverse scientific resources. The goal was to incorporate a broad spectrum of foundational knowledge and insights that are relevant to the research focus.

Addressing the research question, a qualitative inductive research method has been selected for the empirical investigation (Žydžiūnaitė & Sabaliauskas, 2017). The rationale behind this choice lies in the sensitivity of the research topic to its contextual nuances and its relatively limited exploration within the existing literature. Qualitative inductive research proves beneficial in examining phenomena that are novel within the specific context or inadequately explicated by current theories. This methodology facilitates the development of models or topics that contribute to the creation of a conceptual system.

Acknowledging the limited exploration of open health communities and knowledge management applications in scientific literature, there is a recognized necessity for qualitative research to delve into this field. This study aims to bridge this gap by adopting an in-depth approach to explore the multifaceted aspects of open health communities. Notably, open health communities are characterized by a high level of intangibility due to the absence of formal structure, documented processes, and robust knowledge management systems (Hajli, 2014; Rupert et al., 2014; Kordzadeh et al., 2016). In order to address this distinctive context, a qualitative research approach has been chosen as the most suitable methodology.

The further research methodology is structured upon the findings of prior theoretical research, aiming to create a framework for comprehensively understanding and addressing the dynamics of knowledge exchange within the open health communities. In order to address the identified theoretical gaps, the research employs an investigative approach that involves conducting qualitative interviews and scrutinizing the existing literature and practices. During the empirical study, the aim is to understand, analyse, and explain the phenomenon under consideration in detail and develop theoretical insights based on the findings arising from the data.

2.2.2. Embedded Case Study

After identifying the need for the further study of open health communities during the theoretical analysis, an embedded qualitative case study research strategy was chosen for the empirical analysis (Yin, 2014; Scholz & Tietje, 2002). The research adopted an embedded case study approach, aiming to gain insight into the perspectives and interpretations of individuals regarding the specific problem under analysis (Gerring & McDermott, 2007).

An embedded case study design involves the incorporation of multiple units of analysis within a single overall study. It combines the exploration of a specific case within a broader context. This approach is often used when researchers want to

investigate a particular phenomenon or case while considering the influence of its surrounding environment (Scholz & Tietje, 2002). The embedded case study design is especially useful when dealing with complex systems, multiple perspectives, or interdisciplinary research where understanding the broader context is crucial. It allows researchers to explore how different factors or variables interact within a specific case and how those interactions might be influenced by the external factors (Scholz & Tietje, 2002). A case study research is commonly employed to deeply investigate the real-life phenomena within a specific context (Ridder, 2017). These cases in embedded case studies typically involve organizations, issues, groups, or individuals in distinct conditions (Yin, 2014).

In the present study, open health communities serve as the case of interest, allowing for an in-depth examination of their characteristics and dynamics. The cases under investigation often have time and activity constraints; thus, the researcher can use a variety of methods to gather information (Yin, 2014). The researcher can combine theory and practice during the research; the researcher's ability to identify problems and search for possible solutions is developed as well as the researcher's communication skills (Yin, 2014). The embedded case study focuses on investigating seven distinct open health communities, encompassing both direct and online platforms (Figure 11). The inclusion of these diverse community types allows for an exploration of the topic, enabling the identification of similarities and differences between them.

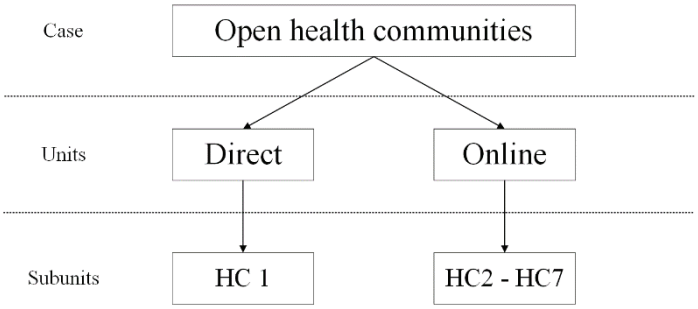


Figure 11. Units and subunits organization in the embedded case study

The embedded case study design involves conducting a case study within a broader context or setting. There are multiple units of analysis, and the focus is to understand a specific phenomenon as a whole case (Yin, 2014; Scholz & Tietje, 2002):

- The study context: identifying a whole broad context of a case which will be studied. The phenomena of open health communities were identified. In order to investigate this phenomenon, a phenomenological approach was employed. The phenomenological approach, as described by Creswell et al. (2012), is commonly used to explore shared experiences among individuals when encountering a particular phenomenon. When adopting this approach, the researchers aim to gain a deeper understanding of the participants' experiences and uncover the essential nature and structure of

the research object through the lens of their lived experiences (Wilson, 2002).

- The embedded case: choosing a specific case within the selected context. In this study, the whole case is open health communities, which involves different units of direct and online communities. In this study, two units of the case, i.e., (1) direct open health communities and (2) online open health communities, were involved.
- Subunits can be identified at different levels of analysis within the case. Subunits should exhibit variability that is relevant to the research question. This variability allows for a richer analysis and a better understanding of the dynamics within the case. The number of subunits can vary based on the complexity of the case and the research goals.
- Data collection: gather the data of the case study and the context. This often involves a mix of methods, such as interviews, surveys, document analysis, etc. In this study, the data were collected via interviews of different subunits and mixed with the triangulation method.
- Data analysis: analysing the data specifically related to the embedded case to understand its characteristics, dynamics, and any patterns or trends.
- Data integration: consider how the findings from the embedded case relate to the broader context, explore the interactions and relationships between the embedded case and its larger environment.
- Generalizing and drawing conclusions: based on the analysis, draw conclusions about the embedded case and consider how these findings may apply or contribute to the broader context.

The embedded case study method was used as a method of empirical research in order to gain a more detailed information and systematically analyse the dynamics of a particular situation and find out less obvious aspects (Tellis, 1997; Rahim & Baksh, 2003). The qualitative research provides a comprehensive understanding of the opportunities and challenges related to the novel approach. This qualitative study focuses on analysing a specific case of communities, aiming to describe the phenomenon of knowledge transfer for generating health innovations within the open health communities. The data collection strategy employed in this study is semi-structured interviews (Appendix 1).

Based on the primary research findings, it was concluded that an extended phase of research would greatly enhance the study. In order to gain a deeper understanding of knowledge transfer models and open innovation factors within the health communities, it is recommended to broaden the scope of the study by comparing the results with a wider range of communities. The findings from the extended phase of the research would contribute to the refinement and expansion of knowledge management models within the context of health communities, highlighting practical implications and the ongoing need for investigation in this area.

With the start of the year of the COVID-19 pandemic in 2020, the importance of the digitization of the health communities became apparent: the creation and transfer of knowledge moved to the virtual space, the popularity of online health

communities increased; thus, the research field surfaced and was included in the online health communities for further research. Online communities provide a unique environment for knowledge exchange and innovation, offering new opportunities and challenges that differ from traditional offline communities. It was decided that by incorporating online communities into the study, a comprehensive understanding of knowledge transfer and open innovation within the health communities can be achieved.

Selection procedure

In accordance with the existing literature and following a purposeful sampling approach (Yin, 2003), a selected set of cases was chosen to facilitate a thorough examination of the phenomenon at hand. The choice of cases was guided by the unique context of women's healthcare across various life stages.

The purposive sampling approach, often referred to as purposive sampling, represents a non-probabilistic sampling technique that is frequently employed in the qualitative research. In contrast to random sampling, which seeks to create a sample that is representative of a larger population, purposive sampling concentrates on the selection of participants who exhibit particular characteristics or possess experiences that are pertinent to the research query (Eisenhardt, 1989; Patton, 2002). The main criteria for purposeful sampling are determined by the specific research objectives and the characteristics or qualities that are important for addressing the general research question. Following the suggestions in the case study literature, a purposeful sampling approach under the following criteria was deployed to meet the focus of this study:

- Relevance: the cases are relevant to the research question and align with the objectives of the study. The cases provide meaningful insights and address the research problem.
- Expertise: the selected health communities state their orientation to the health issues; every participant, as the key informant, due to the focus of the women life-time health context, was female; every participant of the study was attending health community at the time of the study; every participant was of adult age.
- Diversity: the participants were from diverse health communities, were of different age, had different health issues and/or background.
- Uniquality: every health community represents a health issue which is important during women’s lifetime; every health community is open to society; every health community is active at the moment of the study; the membership of the health community is free.
- Accessibility: communities were open to the access; the participants were willing to participate and had the necessary information or experiences that align with the research objectives.

Using the selection procedure, 2 units of different open health communities were selected for the study, i.e., direct and online (Figure 12).

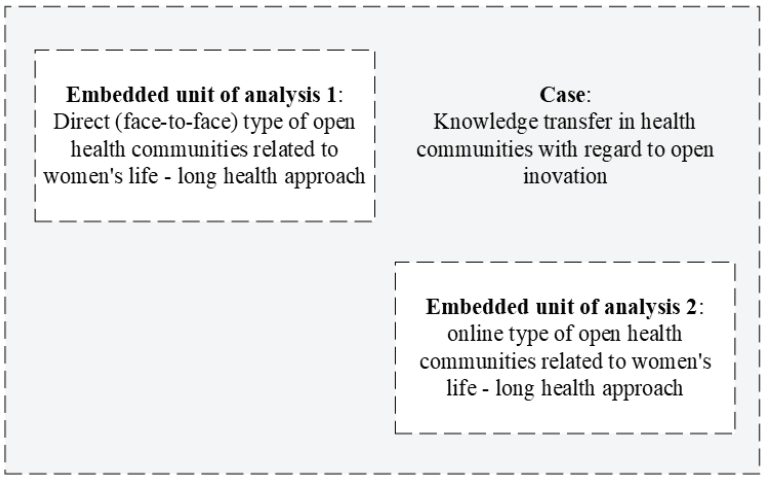


Figure 12. Structural components within the embedded case study analysis

The life cycle perspective allows for the exploration of women's health, considering not only the physiological changes but the social, cultural, and environmental factors that shape women's experiences as well. Recognizing the interconnectedness of these factors, the study aims to contribute to a more holistic approach to women's health according to their attendance to the open health communities. The health communities were searched to seek relation with the following issues:

1. HC1: “AKADEMIJA ŠEIMAI” (EN “Academy for family”);
2. HC2: “NĖŠTUMAS IR VISKAS APIE TAI” (EN “Pregnancy and all about it”);
3. HC3: “GESTACINIS DIABETAS” (EN “Gestational diabetes”);
4. HC4:“VISKAS APIE SKRANDŽIO MAŽINIMO OPERACIJAS” (EN “All about bariatric surgeries”);
5. HC5: “SKYDLIAUKĖS LIGOS” (EN “Thyroid diseases”);
6. HC6: “ŠIRDIES LIGOS” (EN “Cardiovascular diseases”);
7. HC7: “PLASTINĖS OPERACIJOS” (EN “Plastic surgeries”).

2.2.3. Development of the Questionnaire

In order to attain the requisite depth and authenticity of data, a diverse data collection approach is employed, incorporating interviews and secondary data sources. This approach is favoured for its ability to identify all significant elements that are relevant to the theory development through the analysis of distinct, context-specific phenomena and the establishment of systematic connections between the data and theory.

In this study, the primary data sources are interviews, which are actively collected by the researcher while interacting with the informant. The semi-structured interview method plays a crucial role in qualitative inductive research. It enables participants to express their thoughts directly and in an informed manner, contributing

to the generation of rich and substantive material that is essential for a qualitative analysis (Easterby-Smith et al., 2018). During the interviews, no direct questions were used, which manifest themselves in preconceived answers, but they were asked in such a way that it was possible to see the overall picture and then clarify individual topics. Additionally, the interviews aimed to explore the main informational sources of open health communities, facilitators of knowledge transfer, and their influence on innovation inputs.

The interview questions were designed based on the theoretical exploration of the field and the practical investigation during the study process. The structure of interview questions outlined by Yin (2003) can be organized into four main elements (Table 6): (1) *initial questions* – general questions aimed at getting to know the interviewee and establishing a basic understanding of the research area or topic; (2) *main questions* – designed to get deeper into the themes related to the research objectives and hypotheses; (3) *follow-up questions* – presented to clarify the responses, explore specific points further, or gather additional information; (4) *concluding questions* – include inquiries about any additional insights or recommendations.

Table 6. The structure of the interview (according to Yin (2003))

Element of interview questions	Examples
Initial questions	*How old are you?* *What health community do you belong to? What is the exact name of it?* *Briefly tell about the health community you belong to.*
2nd level (Main Questions)	*How the availability of knowledge and the ability to share it changes the patient's knowledge about a health issue?* *How knowledge is shared in your health community among its members?*
3rd level (Follow-up Questions)	*Who do you trust when making health decisions?* *Where else did you look for information to solve a health question?*
4th level (Concluding Questions)	*What is missing for a smoother knowledge sharing process in the open health community you attend?* *How could a smoother transfer of knowledge within the health community contribute to a more efficient creation of innovations?*

A semi-structured interview refers to a conversation that includes a key questions. In this study, the questions posed during the interviews were refined based on the literature review conducted during the theoretical research. This process involved either removing certain questions or rearranging their sequence to align with the dynamics of the survey or the insights gained from the informants' experiences better. The interview protocol began with introductory-level questions, followed by second- and third-level questions prompted by the informants' responses. These additional questions aimed to confirm or clarify new aspects and highlight important

information. As the interview progressed, fourth-level questions were introduced. These questions delved deeper into the informants' perspectives, seeking their recommendations or personal conclusions. Therefore, semi-structured interviews employing open-ended questions were selected as the most suitable method for this study. Their flexibility allowed for a nuanced exploration of the subject matter, enabling the collection of rich and detailed data that are essential for the research objectives. Based on the structure of interview questions, specific inquiries were formulated drawing from literature sources when analysing the topic under study. The table below presents examples of these tailored questions (Table 7).

Table 7. Development of the research questionnaire instrument

Examples of Questions	Authors
What information do you lack the most? *How did you decide, what informational sources you use?* *Where did you look for information?*	Füller, Matzler, and Hoppe, 2008
What information do you use most often? *Which source did you choose and why?* *How did you choose which source of knowledge is the best?* *Are you learning something new by participating in the health community?*	Bose, 2003; Laihonen, 2012
Do you give more of the knowledge you have or you take more than you give? *What do you think is the benefit to the health community when its members share available information and knowledge?* *How do you think the availability and sharing of knowledge changes a patient's knowledge about a health issue? How?* *Do you share your health knowledge with the community?* *What outcome do you hope when you are sharing?* *Is there a clear process for sharing knowledge within the community? Knowledge creation? Transfer?*	Nonaka and Takeuchi, 1995; Bose, 2003; Prihodova et al., 2018; Secundo et al., 2019
Who do you trust when you are making a health decision? *Do reputation, previous experiences, recommendations influence trust?* *Do you trust other community members?*	Randaeli et al., 2014
Is the knowledge you gain sufficient? *What is missing for a smoother knowledge sharing process?* *Who could help to organize the community and co-created knowledge?*	Randaeli et al., 2014
How do you think the products (innovations) that are created in health community help to improve health? *How do you think a smoother transfer of knowledge within the health community could contribute to a more effective innovation?*	Dandonoli, 2013; Allarkhia, 2015; Gabriel, Stanley, and Saunders, 2017

Has your health community created something?	
In your opinion, is this community active? *Are there meetings organized by the community?* *Is it possible for anyone to join the community?* *What is the importance for you to participate in this health community?* *Are there health professionals involved in the community?*	Cherrington, 2003; Füller, Matzler, and Hoppe, 2008; Magnezi et al., 2014; Secundo et al., 2019

These specific questions were carefully crafted to elicit detailed insights from informants, aligning with the research objectives and drawing upon the relevant literature to guide the inquiry process. A semi-structured interview protocol is used during the interviews (Appendix 3). The interview protocol was used during both stages of the research.

The respondents were identified as the members of open health communities rather than individuals. On the basis of the review literature analysis carried out during the theoretical research, the questions were created to be asked during the interview, but they were taken away, or their sequence has changed, taking into account the dynamics of the survey or the experience of the informants. Consequently, in this study, a semi-structured interview approach with open-ended questions was deemed the most suitable method. The construction of research questions was informed by a theoretical literature review and previous research conducted by the other scholars. Instead, the researcher uses an interview navigator, allowing for flexibility to adjust questions as needed to enhance the clarity of responses. As the study progressed, the interview guideline evolved, reflecting a developmental approach that incorporated open-ended questions. Furthermore, the expansions to the questionnaire encompassed a broader range of communities and inclusion of types beyond those that were initially considered.

In this study, the validity was assessed through (1) peer-to-peer review with other researchers and (2) pilot testing of the research instrument. Firstly, the validity was evaluated through a peer-to-peer review process involving collaboration with other researchers in the field. Peer review is a critical component of research methodology, particularly in qualitative studies, as it provides an external validation mechanism to ensure the rigour and credibility of the research findings. The feedback that was received from the peer reviewers was carefully considered and used to refine and strengthen the research methodology. The purpose of the pilot testing was to identify any potential issues with the instrument, such as unclear wording or questions, and make necessary revisions before conducting the full study. During the pilot testing phase, the participants were asked to provide feedback on their understanding of the questions, the relevance of the topics covered, and any difficulties they encountered while completing the instrument. Following the pilot study with a size of 10 participants, the interviews were included as part of the full study. These interviews aimed to further explore the research questions and gather in-depth insights from a larger and more diverse group of participants. The inclusion of interviews in the full study aimed to validate and expand upon the findings from the

pilot study as well as to explore any new themes or patterns that emerged. The feedback was carefully reviewed, and the adjustments were made to improve the clarity, comprehensibility, and appropriateness of the instrument. This iterative process of refinement helped to strengthen the overall quality and credibility of the research findings by ensuring that the language, format, and structure of the instrument are clear, understandable, and relevant to the participants, and the instrument aligns with the research objectives and relevant aspects of the phenomenon that is being studied.

2.2.4. Sample, Data Collection and Analysis

Sample

In this study, a comprehensive data collection process was undertaken, involving 30 interviews with 30 interviewees who were active members of seven distinct health communities. The aim was to gather diverse perspectives and insights from individuals representing various communities within the health domain.

Snowball sampling, as well known as chain referral sampling, is a non-probabilistic sampling method that is commonly used in a qualitative research. It involves identifying the initial participants who meet specific criteria and then using their referrals to recruit additional participants (Bitinas, Rupšiene, & Žydžiūnaite, 2008).

- Initial participants: participants who met the criteria of the research questions were selected. They possessed the desired characteristics: female adult, attends open health community (active member), able to attend the study.
- Network: initial participants were asked to refer other individuals who may meet the criteria and could contribute to the study.
- Diversity: participants were asked to refer individuals from different backgrounds or contexts to ensure a range of viewpoints and experiences. The participants who have in-depth knowledge or personal experiences related to the research topic were preferred to ensure that the study obtains valuable insights.
- Saturation: when the data collection process saturated and new information or insights were no longer emerging, the process of recruiting new participants was stopped. The sample size is sufficient for addressing the research objectives.

The primary data for this research study was obtained through 30 in-depth semi-structured interviews. In order to ensure a representative sample of health communities, active members from the case study communities were selected to participate in these interviews. The underlying philosophical concept guiding the study was centred around the "health of women throughout their lifetime;" therefore, only female adults were chosen as participants to align with this focus. All participants were from 7 different open health communities: “Academy for family”; “Pregnancy and all about it”; “Gestational diabetes”; “All about bariatric surgeries”; “Thyroid diseases”; “Cardiovascular diseases”, “Plastic surgeries”.

In order to ensure the comprehensive exploration of the research topic, the informants were selected through the snowball sampling method, based on different

characteristics, including their involvement in health communities, specific health issues they faced, and their age (Bitinas, Rupšiene, & Žydžiūnaite, 2008). It was crucial to have informants who were active members of the health communities to ensure their familiarity with community processes and management. During each interview, more and more new aspects were revealed and themes identified, and the interview sample was formed until such a level of data saturation was reached, when there was no new information important for examining the phenomenon.

Data Collection

The interviews were conducted over a period spanning from September 2018 to March 2023. Interview locations were chosen based on the convenience and comfort of the participants, as determined by the interviewers. These measures aimed to create a conducive environment for open and detailed discussions, allowing participants to freely share their experiences, perspectives, and insights related to the research topic.

The interviews were scheduled based on the availability suggested by the informants. Convenient time for the informant was ensured, and the arrangements were made to guarantee privacy by conducting the interviews when the informant was alone in a room without outsiders. While a few interviews were conducted in person, the majority took place remotely with cameras on for the visual communication. The duration of each interview ranged from 30 to 90 minutes.

During the interviews, the concept of open health communities and knowledge transfer was explained to the participants to ensure a shared understanding of the topic. All interviews were conducted in the Lithuanian language, as the study focused on the Lithuanian health communities. Both face-to-face and online interview formats were included, providing flexibility for participants based on their preferences and convenience.

As the study is related to the health topic, the sensitivity of the research was considered. The semi-structured interview method has been chosen because it allows informants to express their thoughts directly and helps to create rich material that is necessary for the qualitative analysis. During the interviews, the questions were asked based on the literature review, conducted during the theoretical research phase and adjusted according to the dynamics of the interview or the informant's experience.

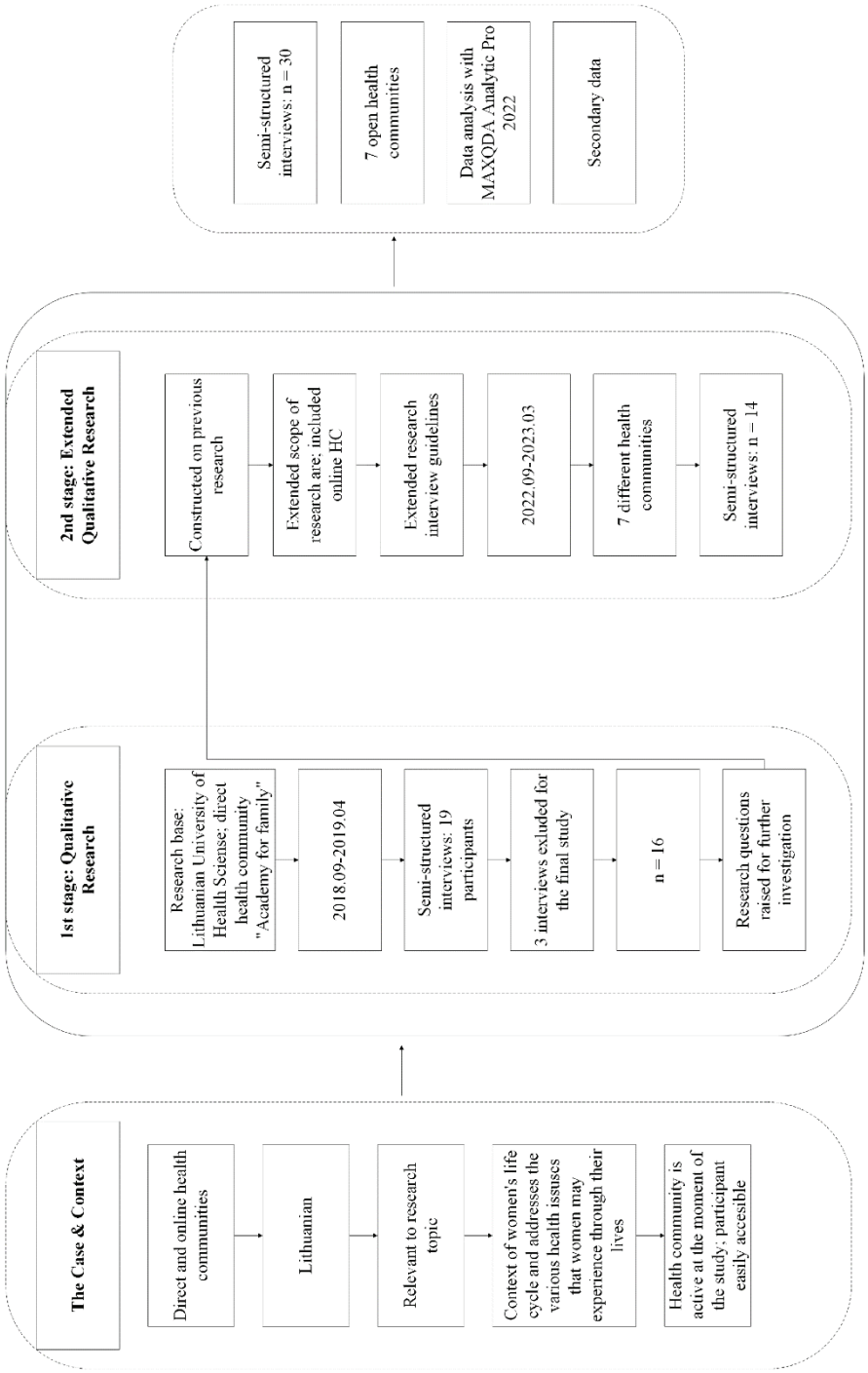


Figure 13. The context of the dissertational empirical case study

The interview protocol includes several levels of questions, allowing for a deeper exploration of the research topic while staying focused on the research question. During the interview process, the ethical precautions were followed to avoid judging the informants' beliefs or the fairness of their views. All respondents were informed that they may choose not to answer questions if they find them uncomfortable. In addition to interviews, secondary data were collected, including legal acts, public information, and information from social media, to triangulate the content and provide a descriptive perspective of the health communities and their formal settings. The data collection process is meticulously documented, and after each interview, the researcher wrote notes about the key moments and insights, which later helped in analysing the material. The sample was formed by using purposeful sampling, ensuring representation from various open health communities.

The interviews underwent manual transcription by the researcher, as currently available automatic transcription programs were deemed insufficient in terms of quality. All interviews, being qualitative in nature, were suitable for comprehensive data analysis. Following each interview, the researcher compiled some memos documenting crucial moments, insights, and reflections.

Combining primary and secondary data facilitated the reconstruction of event sequences, enabling to understand the causality and address the research question. A summary of primary and secondary information sources is outlined in Table 8.

Table 8. Primary and secondary sources of information

	Data Collection	
	Primary data	**Secondary data**
Method	*Semi-structured interviews*	*Desk research*
Size	*15 hours of recordings, 98 pages of transcriptions*	*18 sources* including 7 Facebook pages (groups) of the selected communities*
Data items	*Transcriptions of 30 interviews*	*Websites and documents*
Period	*September 2018 to March 2023*	*January to March 2023*
Description	*Active members of open health communities*	*Information related to open health communities and lifelong women's health in Lithuania*
Type of information	*Respondents were identified as the members of communities rather than as individuals; in-depth information of open health communities (information sources, knowledge transfer activities, facilitators, and needs)*	*Free information from Internet pages and official websites; publicly provided officially accessible documents*

*Detailed information in Appendix 3

Primary data acquisition involved conducting interviews within seven distinct open health communities, wherein 30 participants, self-identified as active community

members, provided valuable insights for the theoretical framework, elucidating the dynamics of these open health communities.

The acquisition of secondary data was executed through content triangulation, enabling the identification of both formal and informal information sources within the public domain that are pertinent to the open health communities. Triangulation was employed to gain a thorough understanding of women's lifelong health philosophy and the current state of affairs in the field. This method facilitated the critical examination of primary data, allowing for deeper insights into the field and enhancing the credibility and reliability of the information that was obtained.

The approach to conducting interviews followed the principle of reaching saturation, wherein interviews were continued until no new insights emerged, ensuring a comprehensive exploration of the chosen subject matter. This study rigorously adheres to the methodological recommendations outlined by Creswell (2001), i.e., suggestions of 20 to 30 interviews to attain research saturation. Research saturation, a critical milestone in qualitative inquiry, signifies the point at which new data cease to introduce novel insights or perspectives, indicating that a comprehensive understanding of the phenomenon under investigation has been reached. Data saturation is important to the reliability of quantitative research; thus, the sample size determines the quality of a nonprobabilistic study (Saunders et al., 2017). Data saturation in the data collection process pertains to the extent to which new data mirror what has already been expressed in the previous data. Thus, the process of probing should persist until the researcher senses they have attained saturation, achieving a thorough understanding of the participant's viewpoint (Saunders et al., 2017). In accordance with this (Cresswell, 2001) principle, the present study conducted 30 interviews. The research seeks to capture the richness and depth of the data by employing this approach, thereby facilitating the data analysis and interpretation of the research findings.

In order to bolster the validity and reliability of the findings, a secondary data collection approach was adopted (Appendix 3). In addition to the methods mentioned earlier, triangulation is employed to verify if consistent findings emerge when a researcher conducts a study utilizing diverse resources, encompassing publicly available data and on-site observations (Im et al., 2023). This involved the triangulating data from diverse sources by systematically exploring all available and accessible information related to the included health communities. The sources covered a broad spectrum, offering valuable insights into various facets of health communities. The secondary data collected for the study is natural, formed without the intervention of the researcher. The secondary data sources are sources that are available in the media, materials from the open health community groups, legalisation defining or not defining a specific activity at a specific time. The integration of various data sources is often termed as triangulation, a method wherein multiple measurements are taken from different perspectives to attain a more holistic comprehension of the phenomenon being investigated (Busetto et al., 2020). The inclusion of secondary data allowed for a better understanding of the open health communities under investigation. It provided a broader context and background

information, enabling the researchers to gain a holistic view of the communities and their activities. The study aimed to ensure the reliability and validity of the findings by examining different sources.

Ensuring the trustworthiness of this study is important in order to highlight its credibility and reliability. Several measures have been implemented to enhance the rigour and validity of the research. Firstly, a systematic and transparent research design has been employed with a detailed methodology outlining the procedures for data collection, analysis, and interpretation. The use of multiple data sources, such as interviews, secondary data, and content analysis, strengthen the credibility of the findings. Additionally, the researcher's reflexivity is acknowledged with careful consideration given to the potential biases and preconceptions. In order to foster dependability, a detailed audit trail of research decisions, processes, and changes has been maintained. The inclusion of member checks where the participants verify the accuracy of the interpretations, further contributes to the study's trustworthiness. Peer debriefing and external review processes have been integrated to invite diverse perspectives, ensuring a more comprehensive evaluation of the study's validity and reliability. To sum up, these methodological strategies collectively contribute to establishing the trustworthiness of the study and the robustness of its findings.

Ethical precautions for qualitative research methods involve ensuring the protection, privacy, and voluntary participation of research participants. Before starting to interview the research participants, their verbal consent to participate in the study was obtained (Aluwihare-Samaranayake, 2012):

- Information and confidentiality: the participants were explained about the purpose of the study, every participant was ensured that their identities and personal information will remain confidential and anonymous, and their personal data will not be exposed publicly.
- Voluntary participation: the participation in the research was entirely voluntary, and the participants were guaranteed with the freedom to withdraw from the study at any point without encountering adverse repercussions.
- Respect for autonomy: the case study was conducted without influencing the responses of the patients to reveal common patterns for scientific purposes. The rights of the participants are protected in order to maintain the integrity of the research and contribute to the advancement of knowledge while upholding ethical standards.

The interviews were conducted in Lithuanian either face-to-face or remotely and were recorded and transcribed with the explicit consent of the participants. In order to uphold confidentiality, the researcher ensures the anonymity of all respondents, particularly given the examination of sensitive information.

The data analysis process involved several steps, including coding, categorization, identification of key topics, and theory development. This qualitative study used a thematic analysis strategy. The examination of the phenomenon's category is undertaken with the objective of elucidate the phenomenon through the integration of distinct codes. The categorical data analysis method, as outlined by

Gioia, Corley and Hamilton (2013), facilitates the systematic and inductive theorization of the phenomenon encountered in the course of this investigation. This approach enables the systematic construction of categories that provide an explanatory framework for the considered phenomenon. The merging of thematic concepts into categories further contributes to the formation a novel theoretical model, effectively clarifying the emergent theory that derived from the gathered data. This analytical technique employed in the data analysis serves to transition from individual components to a comprehensive understanding of the whole. The emphasis on the theory development is integral to both stages of data collection and analysis.

According to Gioia, Corley, and Hamilton (2013), the initial phase of the analysis involved the process of 1st order concepts, wherein the interview transcripts underwent systematic scrutiny. As the research advanced, the similarities and differences among the various categories were examined. This process ultimately led to the reduction of the number of relevant categories to a more manageable level. Pertinent segments of data were discerned and assigned, generated from keywords or sentences encapsulating the core of the information. This procedure served to systematically organize and structure the data, laying the groundwork for subsequent in-depth analysis (Table 9).

Table 9. Systematized labelling and coding in transcript analysis

1st order concepts	**2nd order themes**	**Aggregate dimensions**
Community itself serves as a valuable source Peer-to-peer learning Leader is important in driving to success and effectiveness Issues of democratization of health	Community members Community leaders Attendants	Information sources
Storytelling creates a sense of support Written and visual resources Valuable information and entertainment? Level of health literacy?	Books Journals Brochures Movies Scientific literature	
Wealth of information Accessibility of diversity Positive and negative effects of Internet Empowers to educate themselves What is the quality of information? (Misinformation issues) Experiences around the globe	Internet Social networks Search engines Forums Influencers	
Emotional support Deep empathy Shared responsibility among family members Outdated information?	Friends Relatives	

Lack of the expertise		
Wealth of expertise Specialized knowledge and training Lack of personalization Demanding schedules, lack of time for engagement Is it always up-to-date information?	Doctors Nurses Medical experts	
Direct interactions Explicit to tacit knowledge Occurs among trusted members? The cultural context Sensing and empathizing	Socialization	Knowledge activities
Tacit knowledge is articulated Expressing of personal insights, experiences, skills, and intuitions Sharing and collaboration Enhances the collective understanding	Externalization	
Tacit to explicit knowledge Acquired from diverse sources Unified body of information Connections between elements Deeper insights Edition and systemization Credibility and reliability of shared knowledge?	Combination	
Absorbed and internalized by individuals Learning and sense-making Aspect of experimentation? Collective learning Discussions and feedback	Internalization	
Same facilitators depend on the settings (could be an enabler or a barrier) Accessibility vs. long queues/high cost Trust vs. reliability issues Openness vs. hiding in the shadows Safety Effective leadership Structure Information immediately “here and now” Action plan	Enablers Barriers Needs	Facilitators
Collaboration and innovation Activities to products Sharing practices Inclusive approach	Co-creation	Community-driven innovation
Sense of empowerment Resilience	Engagement	

Self-sufficiency Limited awareness, access, or motivation leads to lack of engagement		
Strategic management Coordination The potential of communities	Orchestration	

Next phase was the categorization process unfolded with 2nd order themes wherein the concepts were systematically grouped into subcodes and main codes. In this second-order analysis, it was explored whether the emerging themes suggest concepts that can effectively describe and explain the phenomena under observation. There has been noted that some emerging concepts may not have a sufficient theoretical grounding in the existing literature. This step aimed to identify the overarching themes and patterns within the data by organizing segments into the meaningful themes. These themes were designed to represent various facets of knowledge integration within the health communities. The structurization process played a crucial role in unveiling similarities and differences in viewpoints across the interviews, thereby contributing to a comprehensive understanding of the data.

Once the feasible set of themes and concepts have been developed, the possibility of further systemization of the emergent second-order themes into third-order "aggregate dimensions" were examined.

In the context of established knowledge transfer model for open health communities, the interplay among the four groups of aggregate dimensions: information sources, knowledge transfer activities, facilitators, and community-driven innovation, are critical for driving effective knowledge transfer and fostering innovation within the community. Information sources serve as the foundation for knowledge transfer within the open health communities. The diversity and richness of information that is available from these sources provide raw materials for knowledge creation and transfer within the community. Knowledge transfer activities encompass various processes and interactions through which information is disseminated, exchanged, and applied within the community. Facilitators play a crucial role in orchestrating and supporting knowledge transfer activities within the open health communities. The facilitators create an enabling environment where knowledge exchange can occur effectively, ensuring that information flows smoothly and individuals are supported in their learning and participation. Community-driven innovation refers to the process through which new ideas, solutions, and practices emerge within the community through collective efforts and collaboration. Community-driven innovation often arises as a result of the interplay between information sources, knowledge transfer activities, and facilitators, where members engage in collaborative problem-solving, experimentation, and iterative improvement. The interplay among information sources, knowledge transfer activities, facilitators, and community-driven innovation within an established knowledge transfer model for the open health communities creates a dynamic ecosystem where knowledge flows freely, innovation flourishes, and community cohesion is strengthened.

The ordered texts were systematically reviewed to unveil the themes within the text that address the research tasks and discern the patterns of knowledge-sharing behaviour among the community members. During the analysis, the primary emphasis was on the identification of knowledge asymmetries, the acknowledgment of common barriers to knowledge integration, and the comprehension of factors influencing the formation of these barriers. Moreover, the analysis entailed an assessment of the potential for bridging knowledge gaps and enhancing knowledge integration within the health communities. In order to ensure that the findings could be disseminated effectively, important sentences from the categorized data were translated from Lithuanian to English.

The data analysis process used qualitative methods and leveraged MAXQDA Analytics Pro 2022 software capabilities to uncover valuable insights about the knowledge integration in health communities. The obtained results indicate similarities and differences between the different types of open health communities, contribute to the development of a knowledge transfer model, and provide practical recommendations for improving knowledge sharing and innovation in open health communities. Based on the empirical data, the analysis aimed to develop a conceptual model for enabling essential knowledge processes within the open health communities at the mezzo organizational level. This involved identifying the principles and mechanisms that facilitate the transfer of diverse and dispersed knowledge, fostering co-creation activities, and promoting the dissemination of innovations within these communities.

In summary, the methodology section of this study serves as the cornerstone for the subsequent results section, connected to the aim of the research. The methodology constructs a roadmap for achieving the research objectives by outlining the systematic approach employed to collect, analyse, and interpret data specific to the unique context of women's health within the open health communities. It establishes the foundation for unveiling essential insights, establishing connections, and deriving meaningful conclusions in the results section.

2.2.5. Overview of the Health Communities and Research Participants

In order to empirically answer the research questions, both direct and virtual (online) health communities were chosen for the examination. The selected direct health community is laid as the foundation for the research, and initially, a project was conducted in this community, but referred to as project “Health innovation development in holistic communities: creating open educational environments for knowledge integration”, which served as the basis for the ongoing thematic research. The direct health community is established by the health experts and physically organized in the largest prenatal centre in Lithuania. Later, in order to study a broader spectrum of communities and based on the results of the previous project research, it was decided to include the virtual (online) communities as well. Virtual communities were specifically chosen on the Facebook platform. The following criteria were applied when selecting virtual communities:

- The participants for the study were selected using snowball sampling method: they identified the community in which they were involved by themselves;
- Community was revised that the thematic focus of the community addresses relevant women's health issues (concept of women's lifelong health according to Clifford (2003)). Women's life course health approach includes all possible areas related to the acute or chronic diseases, aesthetic and health surgery, reproductive health issues, etc. (Clifford, 2003);
- The community is active with posts being shared regularly; the opportunities for communication are free (Kozinets, 2002);
- All online communities are on the Facebook platform. Based on the scientific studies that indicate the specific reliability and importance of the Facebook network (scholars note that the Facebook platform directly impacts the credibility of health knowledge creation (Vainauskiene & Vaitkiene, 2000)) and creates a supportive environment for patient communities (Bennetts et al., 2019; Fedorowicz et al., 2022).

After applying these selection criteria, 1 direct and 6 online health communities of individuals were chosen:

Health community 1 (HC1). "AKADEMIJA ŠEIMAI" (EN "Academy for family") is a community created for pregnant women and their family members. The community was established by the healthcare professionals with the aim of educating and raising awareness among women on relevant health issues. The goal is not only to provide knowledge but to maintain long-term results as well by bringing together initiative groups and creating information sets that will help find accurate information in the future. The community is based at the Department of Obstetrics and Gynaecology of Kaunas Clinics and presents itself as "lectures for families". In this community, regular interactive lectures for families are held in person as well as regular interactive online lectures (with the opportunity to ask questions during live sessions). This health community focuses on topics related to pregnancy, childbirth, breastfeeding, and the postpartum period. They are coordinated by one administrator, and health specialists join on specific topics. The number of members is variable with frequent changes among the participants, and there are no consistent attendees. The community is open to new members (although the number of participants is limited during each live session), and anyone interested can attend online sessions. The community is open to ideas, business, and research. They have already created several products (guidelines, memory aids, educational videos) and organized events that bring together various stakeholders. The health community has participated in scientific projects in which they improved their innovativeness. Therefore, the outcomes obtained in this community are extensive and significant. The main sample for the research (the complete sample of the primary study and the expanded study with 3 participants: 20 participants in total) is specifically drawn from this health community and forms the basis of the research. After the main sample with this community, other communities were added in order to expand the range and get more

diverse results. Other communities are related to women's health issues through the lifetime and differ by their type, size, aims, rules, or other specifics.

Health community 2 (HC2). "NĖŠTUMAS IR VISKAS APIE TAI" (EN "Pregnancy and all about it") is a health community that is thriving as an online platform. It is a group created on social media for women and is "intended for consulting, chatting, discussing, and helping each other with topics that concern us: pregnancy, postpartum period, and newborns up to 1 month old. Other posts will be deleted". This group has over 50,000 registered members, and according to the group's rules, only women can join. The group is private, but anyone willing and agreeing to abide by the group's rules can join. The group rules state that "no sales, buying or selling offers, no giveaways or exchanges. Only advice and recommendations are allowed in the group". Another rule specifies: "no links to the other groups, no event invitations, job offers, contests, or advertisements". The group has been created 9 years ago and generates an average of up to 100 different queries on the specified topics per month. In the group, the members can share photos, experiences, and questions; they can address others by their name or remain anonymous. The group as well organizes online meetings/seminars/events specifically related to the mentioned topics. These meetings have been organized in collaboration with other companies, groups, and healthcare professionals. The group has not organized any official in-person meetings or events, but group members have met voluntarily.

Health community 3 (HC3). "GESTACINIS DIABETAS" (EN "Gestational diabetes") is designed for pregnant women who have been diagnosed with carbohydrate metabolism disorders for the first time after undergoing a glucose tolerance test. The group was created on social media in 2019 and already has 3,500 members. On average, around 50 posts are made in the group per month. The group rules specify that it is "intended for questions, discussions, and sharing experiences, not for advertisements". To date, only one online event has been organized in the group in collaboration with another institution. The group has not created any innovative projects or products. It collaborates with the Diabetes Association for common goals.

Health community 4 (HC4). "VISKAS APIE SKRANDŽIO MAŽINIMO OPERACIJAS" (EN "All about bariatric surgeries") was created to share experiences and opinions before and after bariatric surgeries: "We support each other, celebrate victories, and share what we learn!" Individuals of all genders can participate in this group. On average, the community receives over 100 posts per month and discusses topics not only related to the bariatric surgeries but related to meal plans, physical activity plans, or other experiences related to obesity treatment as well. Health professionals have joined the community, and the online events have been held to provide consultation to the members. Business or scientific subjects can freely join the community, which states their openness to collaborations. No official in-person events have taken place, but there have been several voluntary gatherings. The community has developed a few small products, such as a blood test plan or a meal plan, and has publicly shared them. The group rules state that "There is absolutely no place in the group for mockery, condemnation, or disrespectful behaviour towards

other group members. Misleading or false information will be removed. Advertising is not allowed". The community was created in 2018 and has over 6,000 members. Active members, including the founders of the group, are highlighted in search results as they are the ones who share knowledge most frequently.

Health community 5 (HC5). "SKYDLIAUKĖS LIGOS" (EN "Thyroid diseases"). This community is designed for individuals with thyroid disorders. Anyone interested, regardless of gender, can join this group. The main topics that are discussed include: hypothyroidism, hyperthyroidism, medication, nutrition, blood tests, surgeries, and obesity. The health community was established in 2016 and has over 21,000 members with nearly 1,000 considered active participants. Health professionals, representatives of healthy lifestyle organizations, various associations, and companies seeking to improve disease outcomes have joined the group. Health professionals actively share their knowledge and participate in online events dedicated to the topic. Group members can share their knowledge publicly or anonymously. This group was created on the online social media platform and has only had official meetings online. However, unofficially, the community members claim to have met in person. The group emphasizes that it is open to all collaborations.

Health community 6 (HC6). ŠIRDIES LIGOS (EN "Cardiovascular diseases"). As it states, "The community is dedicated to discussions and conversations about heart diseases and cardiology news. ... Some questions can be answered by cardiologists, so we encourage active participation". The group is public and visible to everyone. It was established in 2021 and is relatively small (almost 1,000 members). The activity that is indicated is around 10 different posts per month. Interestingly, the group declares that health professionals will answer questions, and the community itself was created by a healthcare professional. The community rules specify that drug sales or gifting is strictly prohibited, and other forms of advertising are not allowed. The group rules as well state that "the community does not promote discord between individuals with different perspectives, understandings, or views than yours. Conspiracy theories are also unwelcome". Although it is one of the smallest groups included in the study, it officially indicates its collaboration and knowledge-sharing with other health communities in the same field.

Health community 7 (HC7). "PLASTINĖS OPERACIJOS" (EN "Plastic surgeries"). The community was created in 2017 and brings together over 38,000 individuals. There are almost 300 active members. The group rules specify that it is exclusively for women. The community is intended for "discussions on any topic related to our beauty and plastic surgeries, recommendations, and complaints". Advertising is prohibited in the group, and the rules state not to promote or publicize other communities. Although the group states that anyone interested can join, the rules as well mention that each profile is verified (to avoid fake profiles). The community generates over 100 posts per month. The online meetings are organized in collaboration with plastic surgeons, and the healthcare professionals actively participate in the activities. The community is actively coordinated by one coordinator overseeing the operations. Officially, the community allows for anonymous posting, but the group administrator indicates that it is not encouraged. No official live

meetings are organized, but voluntary meetings among community members have taken place. The community does not mention any created innovative products.

Table 10. Key characteristics of the selected open health communities

Code	Health community	Topics	Year	Size	Interactions per month (approx.)	Type	No. of interviews
HC1	AKADEMIJA ŠEIMAI (***EN "Academy for family"***)	Pregnancy, delivery, breast-feeding, post-natal period	2018	N/D*	10	Direct	19
HC2	NĖŠTUMAS IR VISKAS APIE TAI (***EN "Pregnancy and all about it"***)	Pregnancy, hormones-related issues, physical assumptions during pregnancy, newborn health, family issues	2014	52.9K	80	Online	2
HC3	GESTACINIS DIABETAS (***EN "Gestational diabetes")***	Gestational diabetes forms, nutrition and physical activities during diagnosis, glucose spikes	2020	3.5K	28	Online	1
HC4	VISKAS APIE SKRANDŽIO MAŽINIMO OPERACIJAS (**EN "*All about bariatric surgeries*"**)	Obesity, bariatric surgeries, nutrition, before/after comparisons, support group	2018	6.4K	44	Online	1
HC5	SKYDLIAUKĖS LIGOS (**EN "*Thyroid diseases*"**)	Hypothyroid, hyperthyroid, drug intakes, nutrition, blood tests, surgeries, obesity	2016	21.4K	80	Online	2
HC6	ŠIRDIES LIGOS (***EN "Cardiovascular diseases"***)	Lifestyle with diagnosis, blood pressure, pulse, stimulators, recommendations for specialists, blood tests	2021	722	8	Online	2
HC7	PLASTINĖS OPERACIJOS ***(EN "Plastic surgeries)***	Plastic surgeries, surgeons, before and after comparisons, health related surgeries	2017	37.9K	152	Online	3

*Size of community is unreachable because community involves different members every month: approx. 10–15 members per meeting/~10 meetings per month.

When selecting these diverse open health communities, the study aims to gain a comprehensive understanding of knowledge transfer processes within different healthcare domains. Each community represents a specific health-related area and provides a unique perspective on how knowledge is shared, exchanged, and utilized within these direct and online communities. Table 11 presents the key characteristics of respondents who participated in the research study. These characteristics offer valuable insights into the profiles of individuals involved in the study on the composition of the research sample and providing context for the findings.

Table 11. Key characteristics of respondents in the research study

Number of Participant	HC	Stage	Type	Gender	Age	Role in the Community
P01	HC1	1st	Direct	W	*29*	Member/Active
P02	HC1	1st	Direct	W	*35*	Member/Active
P03	HC1	1st	Direct	W	*33*	Member/Active
P04	HC1	1st	Direct	W	*29*	Member/Active
P05	HC1	1st	Direct	W	*43*	Member/Active
P06	HC1	1st	Direct	W	*24*	Member/Active
P07	HC1	1st	Direct	W	*34*	Member/Active
P08	HC1	1st	Direct	W	*26*	Member/Active
P09	HC1	1st	Direct	W	*29*	Member/Active
P10	HC1	1st	Direct	W	*30*	Member/Active
P11	HC1	1st	Direct	W	*27*	Member/Active
P12	HC1	1st	Direct	W	*28*	Member/Active
P13	HC1	1st	Direct	W	*35*	Member/Active
P14	HC1	1st	Direct	W	*28*	Member/Active
P15	HC1	1st	Direct	W	*28*	Member/Active
P16	HC1	1st	Direct	W	*29*	Member/Active
P17	HC1	2nd	Direct	W	*31*	Member/Active
P18	HC1	2nd	Direct	W	*38*	Member/Active
P19	HC1	2nd	Direct	W	*22*	Member/Active
P20	HC3	2nd	Online	W	*31*	Member/Active
P21	HC6	2nd	Online	W	*61*	Member/Active
P22	HC7	2nd	Online	W	*35*	Member/Active
P23	HC5	2nd	Online	W	*34*	Member/Active
P24	HC4	2nd	Online	W	*44*	Member/Active
P25	HC2	2nd	Online	W	*21*	Member/Active
P26	HC6	2nd	Online	W	*34*	Member/Active
P27	HC7	2nd	Online	W	*30*	Member/Active
P28	HC2	2nd	Online	W	*34*	Member/Active
P29	HC5	2nd	Online	W	*38*	Member/Active
P30	HC7	2nd	Online	W	*43*	Member/Active

3. RESULTS OF THE EMPIRICAL RESEARCH ON KNOWLEDGE TRANSFER IN OPEN HEALTH COMMUNITIES

In order to facilitate a more comprehensive and rigorous examination of the subject matter, it was judicious to identify and emphasize four primary topics for in-depth investigation. These topics serve as pivotal axes around which the study revolves. Informational sources is a topic that delves into the various sources of information within the open health communities. It could involve examining where community members obtain their knowledge, such as academic research, personal experiences, or external sources. Investigating the types and reliability of these informational sources can provide insights into the foundation of knowledge within these communities. Another topic, knowledge transfer activities is the exploration of the specific knowledge transfer activities that take place within the open health communities. This includes the main socialization, externalization, combination, and internalization phases. Analysing how these activities occur, their frequency, and their impact on the community's dynamics and innovation can be enlightening; Facilitators for Knowledge Transfer . Third topic, facilitators of knowledge transfer aims to identify the factors that promote effective knowledge transfer within the open health communities. Understanding elements, such as trust, communication mechanisms, leadership, and community structure, can provide actionable insights for improving these communities. Finally, knowledge transfer influence on innovativeness is a critical topic as it assesses the impact of knowledge transfer on the innovativeness of open health communities. The exploration of whether increased knowledge sharing and transfer lead to more innovative solutions and practices within these communities is crucial to get insights for more successful innovation outcomes. These topics provide a comprehensive framework for further analysis and research. They address the key aspects of open health communities: from the sources of knowledge to the processes of knowledge transfer and their impact on innovation.

3.1. Informational Sources of Open Health Communities

In this research, the categories of knowledge sources were derived through a comprehensive review of all conducted interviews, carefully selecting the pertinent categories from the responses provided by the participants. The investigation focused only on women in order to achieve women’s lifetime healthcare perspective. Five distinct categories of knowledge sources emerged from the data, shedding light on the diverse ways in which these individuals acquire information.

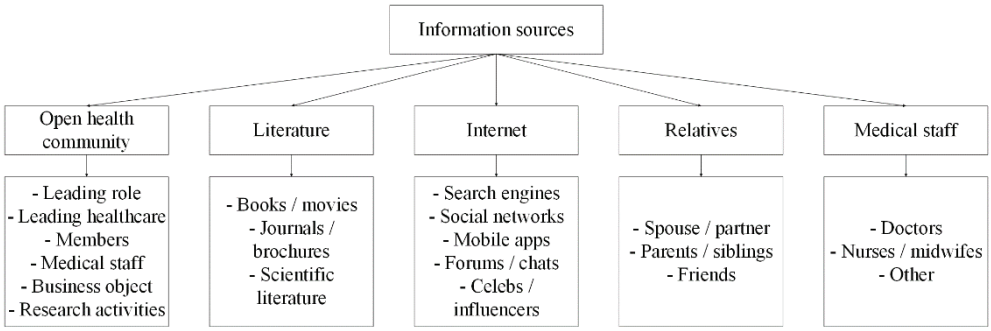


Figure 14. Information sources within the open health communities

Organizer/leader of open health community

The role of the organizer or leader in an open health community is of high importance in shaping its dynamics and effectiveness. The category of "Organizer/Leader" encompasses the presence of an individual responsible for coordinating and guiding the community's activities and initiatives. It was observed that all the communities under study had an organizing person or group in this capacity. However, in the direct health community, the organizers were exclusively from the medical personnel, highlighting their central role in leading such communities: [P17] "*Yes, there were midwife with an experience, psychologist, physiotherapist, children development specialist*", [P18] "*Yes, yes, they [medical staff] coordinate the classes, there are midwives, and there are other health professionals*", [P19]*"... lectures are usually conducted by midwives, there are also psychologists, sometimes social workers*". The interview participants emphasized the significant impact of involving medical specialists as organizers within the open health community. Their presence led to more specific and detailed answers, resulting in a wealth of valuable and practical information: [P17] "*They always answer the asked questions in detail and in greater detail than I expected",* [P19] "*always answers in detail with a lot of useful information, there is also a task he comes up with, it's interesting to participate anyway*". The communities coordinated by the medical staff were observed to be more active, purpose-driven, and focused on achieving specific goals related to the healthcare and well-being: [P01] "*I liked most of the several lectures in other hospitals ... the midwife talks for two hours about how everything happens there, practical advice, how parents really feel there*", [P02] "*until the childbirth lecture, I had no idea about the process ... and now, the staff told me how to do it in practice, I am more confident at the moment*", [P18] "*Super, anyway, now it's really a super team [of medical staff] assembled. This is actively ongoing [community]*".

Online health communities typically have an administrator or moderator who fulfils a crucial role in managing and overseeing the community's activities. The administrator (organizer, leader) serves as the primary point of contact for community members and plays an essential role in ensuring that the community functions smoothly and effectively: [P22] "*the administrator takes an active enough part in the*

activity, filters comments and quickly removes inappropriate participants from the group [community]", [P27] "*This is true, and she [administrator] actively writes, participates, and there are other girls who really have a lot of experience, they express themselves very actively and constantly*", [P29] "*Since our administrator is also active and the community is open, and somehow everything works – I don't know if there is a specific process, but it seems to work well*". While online communities can indeed be valuable sources of support, information, and shared experiences, there is a lack of leadership or even a simple presence of a medical staff: [P22] "*As far as I know, there are no doctors here or they are completely inactive and do not comment on anything ... they do not answer any questions*", [P28] "*did not encounter any healthcare professionals in the community*". The inclusion of healthcare professionals can enhance the community's credibility, improve the quality of shared information, and foster a safer and more supportive environment for health-related discussions. Moreover, having medical staff available to address specific health concerns and answer questions can greatly enhance the overall value and impact of online health communities as sources of support and knowledge: [P26] "*It would be really very useful if healthcare specialists would also participate in the community, it would be possible to ask live questions, as I have seen elsewhere that there are simply some interviews on certain issues that are recorded and you can review them, that would be very useful. ... they could get involved in the process of creating knowledge with broad answers, it is useful to indicate where and who to turn to, advise what to do, sometimes, even tell how to treat, what to change and the like, that would really be useful*", [P29] "*You know, it would be perfect if doctors could join, contribute, answer questions in a timely manner, or at least say: 'you are talking nonsense here or you are talking in the right direction'. I think the doctor who joins the group on this principle will not lack popularity [smiles]*", [P30] "*It would be very relevant and useful for me to have knowledge provided by the doctors themselves, for them to comment on what and how. That would be a good thing ...*". Thus, the role of the organizer or leader in an open health community, particularly when led by medical personnel, is pivotal in driving its success and effectiveness. The presence of medical specialists as organizers enriches the community's discussions with specific, evidence-based information, making it more goal-oriented and practical. Their expertise, credibility, and supportive approach create an environment of trust and active engagement, leading to a more focused and impactful healthcare community. The involvement of medical organizers ensures that the community remains at the forefront of healthcare initiatives, making a positive difference in the lives of its participants and contributing to the overall well-being of the open health community.

Open health communities serve as valuable sources of knowledge for individuals seeking information, support, and insights related to various health topics. These platforms bring together a diverse group of individuals with shared health interests, allowing them to exchange knowledge, experiences, and resources. Learning from others who have faced similar challenges can provide valuable insights and practical tips. Open health communities function as a source of knowledge through their members: [P18] "*I trust a few [other community members], with whom I*

communicate, but certainly not everyone", [P19] "*kind of like a circle of support, even though everyone's situation is very different*", [P20] "*There seem to be quite a few regular and most active members. It is difficult to estimate the exact number. In the community, they not only share information, but also ask questions, there are daily discussions, so some members participate more actively on one topic, and others in another*", [P24] "*It [community] helps a lot. You get a lot of answers, you see other people's [members of community] questions that you might not have even thought about, you get answers that you really needed. You see many examples of how people have succeeded, what paths they have gone through, you see a lot of pain, but then a lot of joy*", [P29] "*I think that in this community I gain more knowledge than I give: the community gathers so many people, one person cannot possibly give more than all the others put together*". The participation of medical staff in open health communities further enhances the community's value as a reliable source of knowledge and support. When medical professionals actively engage in these communities, it brings several benefits to both the healthcare providers and community members: [P03] "*I go to community lectures where specialists present information. ... [in different places] the seminars are different ... but the basics are the same*", [P04] "*I trust more detailed specialist knowledge, which is presented in terms I understand and simpler language, doctors who explain and answer in detail*", [P08] "*I still trust doctors. Anyway, they know more than friends and mothers [pregnant women], so I'm more inclined to follow the doctor's advice*", [P21] "*specialists share seminars and lectures in the community*", [P25] "*Yes, if you notice more than one past or present specialist in the group, who can specifically help in the event of a specific problem. This adds a lot of trust to the community and the information it provides*", [P29] "*There are health specialists, but I wouldn't say that they participate very actively ... they sometimes comment, but very rarely really ... There is one guy, I don't know if he is a coach or a healthy lifestyle specialist, but he very often comments, makes videos, etc. how to adapt to one or another situation, do you know this or that. He talks about weight, hormones, and shares articles from his page on all kinds of topics. Great*". Occasionally, business entities or research may engage as members in open health communities, typically for specific projects or promotional reasons. This involvement can yield advantages and potential obstacles to the community's dynamics and knowledge dissemination procedures, yet members of the community are not very informed about those activities: [P18] "*I don't know much, but with science, they showed that they wrote the article, and they showed that they published the textbook, so there is probably something else involved... Well, we get all kinds of samples of creams, so probably, the business is also involved in some way*", [P19] "*We receive all kinds of gifts from business, so they contribute to participation as well… And for science, sometimes, you need to fill out questionnaires and participate in research like this one now*", [P23] "*also provides research articles with specific results that may help other women. ... I am most interested in the results of scientific articles, which show how this disease can be further managed*", [P25] "*there are scientific questionnaires of all kinds that still ask to be filled out*", [P26] "*It's true that if we create an interesting topic in the community, there is no doubt that*

some guests related to the same topic usually are involved, as for example, in my case, they are doctors of science, some specialists, pharmacists, and so on", [P30] "*I have seen students or researchers interviewing our group members*". Overall, open health communities play a significant role in democratizing health knowledge by enabling individuals to access diverse perspectives and information. As members support one another and contribute their insights, these communities foster a collective understanding of health-related issues and contribute to improved health literacy, ultimately empowering individuals to take charge of their well-being. However, it is essential to approach the information shared in these communities critically and always seek professional medical advice for specific health concerns.

Literature, including books, movies, journals, brochures, and scientific literature, stands as diverse and additional source of knowledge for members of open health communities. These written and visual resources offer a wealth of information on various health-related topics, contributing to the community's overall knowledge base and understanding of health and well-being. Books and movies depicting health-related experiences can foster empathy and understanding among the community members. The stories of individuals dealing with health challenges can resonate with others, creating a sense of solidarity and support: [P01] "*I am looking for information in several ways; first, I got a book from my cousin, then I started reading it, then 100 questions arise, a lot of things become unclear, then you read something extra on the Internet, you ask friends who have given birth. … I would probably already look for information from books with my current luggage, what you can read there*", [P03] "*Well, of course, there is a lot of information out there, both online and elsewhere. I take a book or go to lectures ... For example, I watched the movie 'What to expect when you are expecting', where it is presented with humour, but I did not watch the YouTube videos. But I don't read it as educational films. True, I once compared watching a movie to my state*", [P06] "*I have a 'Book for Mothers'. The length of pregnancy is described there. We got it at the hospital. It's a passport of sorts for mums, what can happen. This is a 'companion' book for us*", [P10] "*books that are similar in content, but also different. Some are more abstract; others provide extensive information. In those books, I found almost all the answers to my questions*". While books and movies can provide valuable information and entertainment, there are instances where they may have negative effects on women's view to health. It is essential to recognize and address these potential negative impacts. Some interviewees found a harmful side of insignificant literature: [P05] "*It was such a shocking experience for me when I first went to a course when I was pregnant, and they showed us 2 birth videos. I don't know what's on now, but I hope horror movies like this aren't shown anymore. But it was definitely a horror movie. There was a black-and-white film, filmed a long time ago, the film is tragic … Everything is scary for a woman waiting for the first time. Such films are harmful. The expression of how the information is presented is also very important*", [P07] "*not 'dry' theories from books ... I took some books from the library, but not all books seem suitable ... Some information seems not suitable for me, then I refuse to read the book*", [P16] "*But you can't raise a child according to a book or advice from a friend, you have to decide for*

yourself", [P17] "*The experiences of people who have experienced one or another situation seem more reliable and useful than those that can be found in books that would define boundaries in the matter of behaviour*". However, scientific literature provides more comprehensive and in-depth insights into specific health conditions, medical research, and healthcare practices. They offer a more thorough understanding of complex medical concepts and advancements. Scientific literature presents evidence-based findings and research studies conducted by the experts in the medical and healthcare fields. Community members can rely on this data for accurate and reliable information: [P02] "*I'm looking for sources that list the doctor's name and authorship. These must be journal articles based on the scientific research. Or written by trusted doctors or medical professionals*", [P05] "*It must be specialized, not the most popular portals ... it must be based on the scientific research [article] ... it must be based on what research, in which year it was carried out*", [P11] "*I need the information to be from a good page, where it is not mothers who create the content, but it can be seen that it is based on some research, where it provides numbers ... when you need an accurate and considered opinion, it must be professionals, a doctor, research results, and scientifically proven*". Incorporating literature as a source of knowledge in open health communities enriches the community information-sharing processes and fosters a culture of continuous learning and informed decision-making. The community members can further enhance their health knowledge, understanding, and overall well-being by promoting access to diverse and reputable literary resources. Scientific literature and journals often introduce emerging medical practices, treatments, or technologies that may be relevant to the community's interests. Staying updated on such advancements can empower members with more informed choices.

Internet is a source of knowledge that was identified by all the respondents in one or the other way. Of course, nowadays, it is natural, and it should be noted that 11 respondents communicating in their community via Internet think similarly. In this analysis, Internet includes search engines, social networks, mobile apps, forums, and chats, celebrities or influencers; thus, it is a very popular source of knowledge for members of open health communities. It offers a wide scope of information and facilitates communication, enabling community members to access diverse perspectives, resources, and support related to health and well-being. However, it as well presents certain positive and negative effects that should be acknowledged. Many interview participants answered that they search for information on the Internet, access it faster than at doctors, search for information daily and actively; Internet provides easy access to a wide range of health-related information, empowering community members to educate themselves on various topics: [P01] "*When debating questions arise, I don't pretend to be an expert and google them on the Internet*", "*Anyway, information can be collected from a lot, e.g., mom fashionistas [influencers] where they put themselves with their bellies on Instagram, how their room or everything looks like*", [P02] "*Yes, I look for information on the Internet every day. I was looking for information about my health, various types of non-medical information, such as clothes, food, etc. ... I don't want to waste the doctor's time asking*

about everyday information. I need this information here and now, so I go to the Internet", [P06] "*I'm looking for information on forums, social networks ... I follow a group of women on Facebook who are going to give birth in the same month. So, I read information, comments, compare, and conclude if everything is fine with me*", [P10] "*Of course, in these days of technology, you start looking for information on the Internet first. Because it seems the most accessible, only then you choose what is useful for you and what is not. My search began with a single word entered into the Google platform search*". Internet is accessible 24/7, allowing community members to seek information and support at their convenience: [P21] "*The fact is that it is easier to get information on the Internet than at a doctor. We know what kind of queues there are, but at cardiologists, it is completely unreal*". Thus, Internet offer diverse viewpoints and experiences from across the globe, fostering a more comprehensive understanding of health-related issues. However, many respondents as well emphasized the negative side of the Internet: [P01] "*There are several different things here, either you get medical information from doctors ... or if you read it yourself on the Internet, you will think you are going to die*". The access to health information on the Internet can lead to anxiety and self-diagnosis, which may not always be accurate and could exacerbate concerns: [P02] "*I read on the Internet what was written in the forums: the information was terrible. I started to panic about it. I called the emergency room for a consultation. But they didn't give any advice, they just took me to the doctor. ... Overall, the health situation was simple and ordinary*", [P04] "*There is an overabundance of information on the Internet, and it is difficult to choose the right and necessary one that answers the questions of concern ... I found excessive information and the opposite on the Internet, which made it difficult to answer the questions of my concern*". Internet contains misinformation leading to potential health risks if individuals rely on inaccurate or unverified information. Reliance on Internet sources for medical advice may lead to inaccurate self-treatment or delayed professional healthcare seeking: [P06] "… *my friend started breastfeeding and read that some breast lumps are not serious. And then she needed surgery due to very serious consequences: inflammation, antibiotics, etc. This was a specific situation where professional help was needed, but not the Internet. She harmed herself. It seems that there is nothing serious, but it can be the beginning of an illness*", [P08] "*I searched online how this operation is done, and I was really shocked by the video, and I got a lot of fear. So, I continue to try to avoid watching such videos*". Not all individuals have equal access to the Internet or digital literacy, leading to disparities in health information access among different segments of the population: [P08] "*On the Internet, you need to learn to pay attention and select information ... The doctor says that you should surf the Internet less, because you can really take too much of everything harmful*". Community members may face cyberbullying or encounter harmful content on the Internet, which can negatively impact their mental well-being: [P02] "*Some women wrote on the Internet about their problem, such as being pregnant and without a husband, he left her, etc., so other participants often condemn and blame, such statements can have very bad consequences*". In order to maximize the positive effects of Internet usage in open health communities and minimize the

potential negative consequences, it is essential to promote digital health literacy, encourage critical evaluation of information sources, and provide clear guidelines on safe and responsible online interactions. Emphasizing the role of healthcare professionals and credible sources in guiding health-related decisions can help ensure that Internet-based knowledge contributes positively to individuals' well-being and healthcare outcomes.

Relatives, encompassing spouses/partners, parents/siblings, and friends, play a substantial role as knowledge sources within the open health communities. Their experiences, support, and insights can have a dual impact on health. Relatives can provide emotional support during health challenges, which can positively impact mental well-being and coping mechanisms: [P09] "*… it's just that if I more or less knew the answer, but I was worried; I consulted my husband, mother, friends... Just to calm down maybe, but not to search for some new answer*". Relatives often have a deep understanding of an individual's health history and can offer empathy, creating a supportive environment for health-related discussions. The significance of spouses and partners as a knowledge source was highlighted, underscoring the vital role of family support in decision-making processes: [P04] "*Husband, mother, friend's advises... We consult somehow, I have friends who know about health issues, and I often turn to them so that I don't bother the doctor every time ... They help me in everyday household matters, calm me down because of unnecessary and excessive questions or concerns, when there is nothing to worry about at all"*, [P06] "*It was a few years ago when the doctors diagnosed me with the disease. And my husband was helpful. And my husband, it seems he could not help me much ... but sometimes, saying my thoughts out loud helps a lot. Sometimes, it happens that we talk, and then we decide whether to tell my mother or the doctor; we decide together with my husband*". Sharing health-related knowledge was perceived as a shared responsibility among family members. Other family members, such as mothers, sisters, aunts, and mothers-in-law, were mentioned as well as sources of knowledge: [P03] "*We discuss with my grandmother ... and my mother-in-law tells us about her experience, and so does my sister. You share information with loved ones, and they support you*". However, the respondents expressed reservations about relying on their mothers' knowledge, considering it outdated and less trustworthy compared to the information from the healthcare specialists, the Internet, or other mothers with similar experiences. While relatives provide emotional support, they may lack the expertise of healthcare professionals, leading to gaps in knowledge or delay of seeking appropriate medical advice: [P01] "*I didn't ask my parents or my husband's parents. You can read elsewhere what is popular and what is not*", [P15] "*Of course, you sometimes consult with your family and your husband about something. And anyway, mothers are not always right with their advice, with outdated knowledge. Maybe my husband and I talk more*". However, friends, colleagues, and close acquaintances were recognized as valuable sources of necessary knowledge, particularly when they had practical experience or were familiar with specific issues known to the respondents. Close relatives may share practical advice based on their own experiences, offering valuable insights into managing health conditions or navigating the healthcare system: [P11]

"*I usually research the environment anyway, I ask my mother, friends, or acquaintances who have had experience, then I read, and if necessary, I make an appointment with a doctor"*. Individuals must carefully assess the shared information and seek professional medical advice when appropriate for relatives to have a positive impact in open health communities. Creating an environment of open communication and support within the community can enhance the benefits of relatives' involvement while addressing any potential issues. Embracing a comprehensive approach that integrates insights from trusted relatives and healthcare professionals can result in better-informed decisions.

Medical professionals, such as doctors, nurses, and midwives, play a crucial role as external knowledge sources within the open health communities (in this case, they stand outside the open health community boundaries). Their wealth of expertise and experience in the healthcare domain establishes them as dependable and esteemed authorities on diverse health-related subjects. Medical professionals possess specialized knowledge and training, ensuring that the information they provide is evidence-based and accurate. Their expertise helps community members access reliable health information: [P03] "*When you go to the doctor, you ask everything; they do tests for you, and it becomes clear when you discuss it with the doctor*", [P12] "*For example, when there was something wrong with my health, I just went to the doctor, had detailed blood tests, and that's it. Just that information is enough*", [P14] "…*doctors are most reliable in all matters*", [P16] "*Now, it's like that (I ask doctors) ... as I mentioned, I ask doctors, not for curiosity on the Internet, but for reliable information*". The medical professionals empower patients to actively participate in the management of their health and engage in collaborative decision-making processes by sharing their expertise and knowledge. Although medical professionals play a vital role as valuable knowledge sources in open health communities, it is essential to be mindful of potential negative side, such as limited availability, lack of personalization, or inaccurate information. Medical professionals have demanding schedules, and their time for engagement may be restricted. This limited availability could result in delays in responses or inadequate support for community members: [P02] *"I can't contact my doctor ... Bleeding started suddenly. I was very scared and called my doctor: she is not working and cannot answer anything"*, [P03] "… *it's about how you feel, is it normal, or is it abnormal, you don't have to go to the doctor every time, they don't have time for that*", [P07] "*My doctor didn't give me any comments about my blood test results, so I had to look for information*", [P21] "*The fact that it is easier to get information (elsewhere) than from a doctor. We know what queues there are*". Not all medical professionals may provide up-to-date information. Some may promote personal biases or outdated practices, leading to misinformation within the community: [P15] "… *our doctor is old; you really don't get much information from her. You just come, get weight measured, and that's it. Realistically, you won't get any information from her*", Medical professionals may provide general information, but they may not have the opportunity to offer personalized advice: [P21] "*It is impossible to get the doctor to tell you anything apart from the fact that we are operating. Or we don't operate. To get a ticket for a consultation, go to the Ways of*

the Cross. You go, you get, and you start, maybe just asking something... Your time is really running out. And in those few minutes of precious attention, you have to decide whether you should have an operation. How? People spend years thinking and not making up their minds. It takes maybe 10 minutes, and I had to experience it myself that I didn't come to sign up for an operation, but to talk. ... I thought I would listen and decide. And you must feel guilty for coming? Why should I feel guilty for coming to a doctor's consultation?", [P29] "*… the doctors don't say anything... I remember they didn't tell me anything at all, well, take your medicine, all the best, good luck in life, see you in half a year... You leave as if you were beaten*". In order to reduce these negative effects, open health communities should emphasize the importance of critical thinking and fact-checking, promote balanced discussions involving multiple perspectives, and encourage community members to seek very professional medical advice for serious health issues.

After the examination of the knowledge source categories, it is evident that formal knowledge predominates within the studied health community. Priority is placed on the knowledge that derives from the medical specialists, articles based on the medical research or physicians' perspectives. Informal knowledge from online sources is typically employed for minor health concerns to supplement formal knowledge. Additionally, tacit knowledge is often characterized as experiential and practical knowledge. The participants assert that for significant health matters, they primarily seek guidance from medical specialists, expressing their trust in their expertise. However, when their intention is to expand knowledge or acquire new insights, they turn to the Internet and engage in open health communities' activities. Consequently, patients find it challenging to navigate between different forms of knowledge.

The findings of this research were systematically presented in Table 12. Each participant's named knowledge source was marked: "+" sign indicating the sources mentioned by the interviewer and "-" sign for sources that were not mentioned. This comprehensive examination provides valuable insights into the diverse sources of knowledge utilized by women and their close environment members. Understanding these categories allows healthcare professionals to tailor information dissemination and support systems effectively, ensuring expectant and pregnant individuals to receive accurate, evidence-based information throughout their journey to better health.

Table 12. Key results from research on information sources in open health communities

	Type	DIRECT																		ONLINE										
	Int. No.	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30
	INFORMATION SOURCES																														
Open health community	Leading role	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Leading healthcare	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
	Members	+	-	+	+	+	+	+	+	+	+	+	-	+	+	-	-	+	+	+	+	+	+	+	+	+	-	+	+	+	-
	Medical staff	+	+	+	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	-	+	-	+	+
	Business objects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	+	-	+	+	-	-	-	+
	Research activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	-	-	+
Literature	Books/ movies	+	-	+	+	+	+	+	-	+	+	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Journals/ brochures	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scientific literature	-	+	-	-	+	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Internet	Search engines*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	-	+	-	-	-	+	-	-	-
	Social networks**	+	-	+	-	-	+	+	+	-	+	+	+	+	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+
	Mobile apps***	+	-	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Forums/ chats	+	-	+	-	-	-	+	+	+	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Celebs/ influen.	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relatives	Spouse/ partner	-	-	-	+	-	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Parents/ siblings	-	+	+	+	-	+	-	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Friends	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	-	+	-	-	-	-	-	-	+	-	-	-	-	+
Medical	Doctors	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	-	-	+	+	+	+	-	-	-
	Nurses/ midwifes	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*a/e Google, Bing, YouTube, etc.; **social networks (a/e Facebook, Instagram, LinkedIn ant other) as information search engine, followed pages, hashtags.

3.2. Open Health Communities Through the Knowledge Transfer Activities

Based on the empirical study data, it was observed that the examined health community adopts the stages of knowledge creation as outlined by Nonaka and Takeuchi (1995), Nonaka and Konno (1998), and Nonaka et al. (2008). In order to illustrate the processes of knowledge interacting, capturing, organizing, formalising, identifying, sharing, selecting, adapting within the open health community as well as how the knowledge is shared and utilized in practice, the interviews were analysed using a knowledge management model encompassing the stages of socialization, externalization, combination, and internalization.

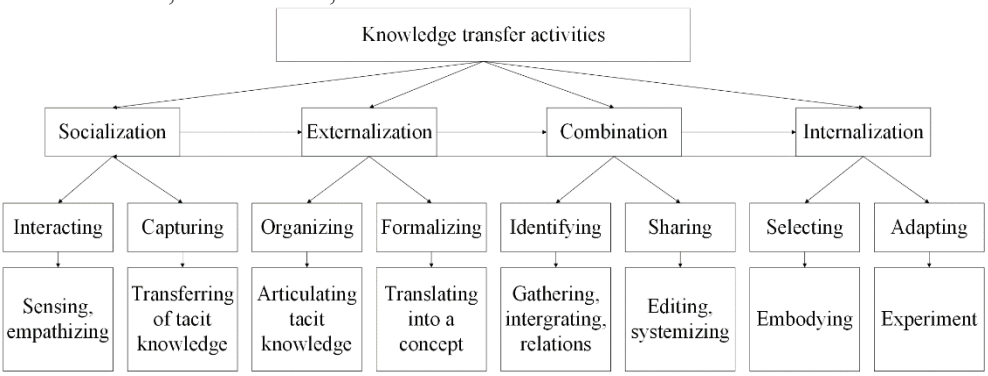


Figure 15. Knowledge transfer activities within the open health communities

Socialization plays as a baseline role in the SECI model (creation and transfer of knowledge), as it involves direct interactions between individuals, healthcare professionals, such as doctors and nurses, to discuss specific health issues. These interactions facilitate the sharing of experiential knowledge between individuals, laying the groundwork for further learning and active participation in the knowledge development process. Additionally, socialization occurs among close and trusted community members, including family, friends, and other patients within the same cultural context or hospital setting. In these interactions, tacit knowledge is exchanged through shared experiences, skills, and know-how, often infused with emotions of care, love, trust, energy, passion, and occasionally tension, especially when criteria for the novelty and validity of knowledge are not met. Most importantly, standardized and evidence-based information may become intertwined with experientially derived information and rumours, forming the basis for shared knowledge among different communities of practice. Knowledge sources within the socialization processes can lead to a complex and diverse range of knowledge being disseminated within the open health community. During the socialization phase, sensing and empathizing play significant roles in fostering effective knowledge exchange. Sensing involves being attentive and perceptive during social interactions. It requires individuals to actively listen and observe others, not just to the spoken words but to the non-verbal cues and emotions. The individuals can pick up on subtle nuances, unspoken concerns, and underlying emotions through sensing, which may influence the knowledge-sharing process: [P01] "*I've already been to one lecture in the community, I just wanted to*

compare and get to know the atmosphere there ... I probably like it more that you want to feel that atmosphere too, that the rooms where you are also give something, you feel good there", [P08] "*At least in my community, people are very friendly and supportive*", [P22] "*It's just nice to feel that there are like-minded people*", [P28] "*… you see people who match you, that's what happens next time you ask directly: 'has it happened to you? "*". The emotional dimension of socialization and sensing creates an environment of trust, making individuals more willing to share their experiential knowledge, even if it may be mixed with rumours or non-standardized information.

Empathizing goes beyond merely understanding others' perspectives; it involves putting oneself in their shoes and truly experiencing their feelings and emotions. When individuals empathize during socialization, they create a deeper connection with others, enhancing trust and openness. This emotional connection fosters a supportive environment, encouraging individuals to share their experiential knowledge more openly. Being attentive to the emotions and experiences of others, the community members can foster a supportive and empathetic environment that encourages the sharing of valuable tacit knowledge: [P10] *"... [community] is a great opportunity to meet and chat with other women, get out of the house, and spend time in the atmosphere that is relevant to you now*", [P17] "*Anyway, we discuss, talk to each other when we find common problems, it is important that you feel not alone*", [P24] "*… you see other people's questions that you might not have even thought about, you get answers that you really needed. You see many examples of how people have succeeded, what paths they have gone through, you see a lot of pain, but then a lot of joy ... somehow together you feel stronger, there is support, it is easier to make a decision*", [P25] "*The community helps a lot because it brings like-minded people together in one place. They understand you because there is unity and understanding for someone with a disease that others also have. You feel not alone. They delve into your problem, respond, and you get an answer that you can't get anywhere else so quickly. You get not only a community, but also support, I would even say friends*", [P29] "*Maybe people would like to get to know ... Some share willingly, others ask countless questions, others are angry and dissatisfied with everything... Sometimes it's annoying, but you understand, maybe a person is tired of illness and life …*". In the context of socialization within an open health community, both sensing and empathizing are instruments to capture tacit knowledge. When patients interact with healthcare professionals or other community members, being attuned to the emotions and unspoken concerns of the involved individuals can lead to more meaningful and empathetic exchanges. Empathy helps bridge the gap between the expert medical knowledge of professionals and the personal experiences of patients, allowing for a richer exchange of insights and understanding. During socialization, community members share their firsthand experiences, skills, and know-how related to health issues. Sensing and empathizing enable others to connect with these experiences on a deeper level, facilitating the transfer of tacit knowledge. The emotional dimension of socialization creates an environment of trust, making individuals more willing to share their experiential knowledge.

In the SECI model, **externalization** is the stage where tacit knowledge is articulated and translated into explicit concepts or forms that can be shared and communicated with others. This process involves converting subjective and experiential knowledge into objective and tangible representations. When articulating tacit knowledge during externalization, individuals express their personal insights, experiences, skills, and intuitions in a way that can be understood and communicated to others. This may involve using language, visual aids, metaphors, stories, or diagrams to convey complex ideas in a more accessible manner. Individuals make their tacit knowledge more explicit through externalization, allowing it to be captured and recorded for wider dissemination: [P01] "*Well, for example, contributes photos from the maternity hospital. I have such and such contents in my suitcase for the maternity hospital, so, for example, since their due date is approaching, I will ask what you didn't need, what you put too much in your bag, what not to take there*", [P21] "*Yes, when I see a relevant question about which I have some experience, I don't mind sharing it, I answer ... About health, medicines, specialists, I speak from the bottom of my heart about what helped me, what my lifestyle is like*", [P22] "*I'm curious about it anyway, because there they also share the results (photos) after all the plastics*", [P29] "*… in this or even a similar situation, what is clear from practice, or how I felt, what I read where*". Translating tacit knowledge into a concept involves transforming abstract and implicit information into concrete and explicit forms. For example, a healthcare professional with expertise in a specific medical procedure may externalize their knowledge by creating a detailed step-by-step guide or a training manual, making the procedure understandable and replicable for other medical professionals. In an open health community, externalization is essential for effective knowledge sharing and collaboration. When individuals externalize their tacit knowledge, it becomes accessible to a broader audience, including other community members, healthcare professionals, researchers, and even the public. This process enhances the collective understanding and expertise within the community and contributes to the overall growth of knowledge: [P19] "*All I know is that they deliver various leaflets, the video shows this*", [P14] "*… it's interesting to hear how it was for someone, how everything went, I adapt for myself but at the same time I try to accept that it may be different for me*", [P17] "*Each community meeting takes up a different topic. The topic is explained in detail from the midwife's experience, as well as from the experiences of mothers/couples/families she has met, videos have been prepared to make it easier for people to understand what it is about … As I mentioned above, knowledge is conveyed together and by illustrating it",* [P24] "*… somehow just pulled me in and that's it. Maybe due to the fact that we have started to participate more actively here. It looks like we are discovering it in action. And we will share the plans and some news if we find them*", [P30] "*Yes, I learn new things all the time, there are topics where I am interested in, because they are relevant to me, but the women there come up with things that I have never heard of before, it really enlightens me as well ... Of course, there is (the benefit of sharing knowledge), because people already know what it's like, it gives more information and courage for new people; sometimes, it is very helpful, especially when doubts are really big*".

The externalization stage fosters a culture of knowledge exchange and learning within the open health community. When translating tacit knowledge into explicit concepts, the individuals can bridge the gap between personal experiences and shared understanding, facilitating the dissemination and application of valuable insights. This stage is particularly crucial for the creation of best practices, guidelines, standardized information and innovation, ensuring that the knowledge is not confined to individual experiences but is available for the wider use and benefit.

Within the SECI model, the **combination** stage serves as a phase where explicit knowledge, acquired from diverse sources, is harmonized, relationships are discerned, and the knowledge is refined and organized to construct a coherent and unified body of information. This process involves amalgamating distinct elements of explicit knowledge to cultivate a more extensive and interconnected comprehension of a particular subject. Once the knowledge is gathered, the integration process begins. Different pieces of explicit knowledge are merged and aligned to create a coherent and unified body of information. The efforts are made to identify relationships and connections between different elements of knowledge. This may involve recognizing patterns, causal links, correlations, or complementary aspects within the gathered information. The community members can gain a deeper insight into the subject matter by understanding these relationships. As the knowledge is integrated and the relationships are identified, the next step is to edit and systemize the information. This process includes refining the content for accuracy, consistency, and clarity. Information is presented in a structured manner, making it easier for community members to access and apply the knowledge effectively.

The findings from the interviews highlight a challenge and gap encountered by the open health communities during the combination phase. In many communities, it was observed that there exists a deficiency in terms of structure, systematization, and the effective integration of individual knowledge. This deficiency hampers the seamless consolidation and organization of explicit knowledge within the community: [P11] "… *there, the topics are not systematized, and the same question is not always commented on*", [P14] "*So that the information is structured, easily accessible, easily encrypted*", [P18] "*I vote for the fact that all knowledge is organized and coordinated*", [P24] "*But it would be good if some kind of structure appeared, when I'm talking now, I think that I've seen rules and other things in other groups, but we don't have them, so we need to sit down and think about it, it would be nice to create something really useful from what we're talking about, because I know and we have a lot of experience*", [P27] "*I think that there is some kind of consistency, maybe topics should be entered, because now everything is like that... Well, without a system now*", [P29] "… *more specific information for specific cases and somehow to systematize that information, as I said, the flow is enormous, it is very easy to get lost*". The lack of structure in the combination phase may lead to scattered information, making it challenging for community members to access and comprehend knowledge continuously. Without a well-defined system for organizing and categorizing information, community members may struggle to locate relevant knowledge, hindering their ability to make informed decisions and collaborate effectively.

Furthermore, the lack of structure and systematization in the combination phase could have a significant effect on the innovation process within the open health communities. Inconsistencies and unreliable information resulting from this gap may hinder the community's ability to develop novel and groundbreaking approaches to healthcare challenges. Innovation relies heavily on the availability of accurate, reliable, and well-organized knowledge. When explicit knowledge is not effectively combined and systematized, community members may struggle to access the necessary information needed to drive innovation. This highly reduces the development of new ideas, strategies, and solutions to address the emerging health issues. In order to foster innovation within the open health communities, it is crucial to address the challenges in the combination phase. Implementing structured processes for organizing and systematizing explicit knowledge can enhance the community's ability to access relevant information for innovation. Moreover, promoting collaborative efforts and knowledge sharing can facilitate the identification of potential synergies and opportunities for novel approaches to the healthcare challenges.

Open health communities can create a fertile ground for innovation by improving the combination phase and ensuring the credibility and reliability of shared knowledge, leading to improved healthcare outcomes and solutions that positively impact the well-being of individuals within the community and beyond. In order to address this challenge, open health communities can focus on implementing strategies to enhance the combination phase. This may involve developing clear guidelines for organizing and structuring knowledge, creating standardized templates or frameworks for presenting information, and promoting collaborative efforts to identify relationships and connections between different pieces of knowledge. The open health community, by combining explicit knowledge, becomes a hub of valuable and organized information, supporting its members in achieving their common health-related goals.

The internalization is the phase where explicit knowledge, acquired and shared within a community, is absorbed and internalized by the individuals, becoming part of their tacit knowledge and personal experiences. During this stage, the individuals embody the knowledge, making it a natural part of their thinking, decision-making, and actions. Internalization is a process of individual learning and sense-making. It occurs when community members actively engage with explicit knowledge, reflect upon it, and integrate it into their existing mental frameworks. As individuals internalize knowledge, it becomes more than just information; it becomes a part of their cognitive repertoire, influencing their beliefs, attitudes, and behaviour: [P29] "*I feel active in the community, because it helped me a lot when it was difficult, so I try to help others by sharing my knowledge*", [P20] "*In this group, I get more information, but I can also share a lot of my acquired skills and knowledge when another member has a question that I have the competence to answer*". The experimentation is a critical aspect of the internalization phase. As individuals embody explicit knowledge, they often experiment with its application in various contexts. When applying the knowledge to real-life situations, individuals can test its validity, relevance, and

effectiveness. This process of experimentation allows for continuous learning and refinement of the internalized knowledge. In an open health community, internalization is a crucial stage for individual empowerment and skill development. As community members internalize explicit knowledge, they become more proficient in managing their health, making informed decisions, and actively participating in their healthcare journey. Through experimentation, individuals gain confidence in applying the acquired knowledge to diverse health-related scenarios, enabling them to adapt and respond effectively to changing circumstances. Moreover, internalization fosters a culture of learning and continuous improvement within the open health community: [P01] "*After some time, I realized that I already know all this, but I lack practice*". As individuals share their experiences of applying internalized knowledge, it sparks discussions and feedback, contributing to the collective learning and knowledge refinement. In order to facilitate the effective internalization within the open health community, it is essential to provide opportunities for active learning, reflection, and experimentation. This may include interactive workshops, peer support groups, case-based discussions, and opportunities for individuals to share their experiences and insights with others. When embracing internalization and encouraging experimentation, open health communities can empower their members to become knowledgeable, proactive participants in their healthcare journey, ultimately leading to improved health outcomes and enhanced well-being for the entire community.

Table 13. Implementation of knowledge transfer in open health communities

	SOCIALIZATION		EXTERNALIZATION		COMBINATION		INTERNALIZATION	
	Interacting	Capturing	Organizing	Formalizing	Identifying	Sharing	Selecting	Adapting
	Sensing and empathizing	Transferring of tacit knowledge	Articulating tacit knowledge	Translating into a concept	Gathering, integrating, finding relations	Editing ant systemizing	Embodying	Experiment
HC 1 (P01–P19)	+	+	+	+	+	+	+	+
HC 2 (P25; P28)	+	+	-	-	+	+	-	-
HC 3 (P20)	+	+	-	-	-	-	-	-
HC 4 (P24)	+	+	+	+	-	-	-	-
HC 5 (P23; P29)	+	+	+	+	+	+	+	+
HC 6 (P21; P26)	+	+	-	-	-	-	-	-
HC 7 (P22; P27; P30)	+	+	+	+	-	-	-	-

3.3. Facilitators of Knowledge Transfer in Open Health Communities

In the realm of open health communities, the dynamic interplay of accessibility, trust, openness, and democratization serves as a cornerstone for their effectiveness and evolution. This section delves into the facilitators, i.e., enablers, barriers, and needs, that shape the landscape of these communities. Thus, the forces that foster accessibility, cultivate trust, promote openness, and ultimately drive the democratization of knowledge and healthcare information within these diverse and inclusive digital ecosystems are explored. Certainly, the facilitators of accessibility, trust, openness, and democratization are not just important elements within the open health communities; they are drivers of successful knowledge transfer and innovation. They create an environment where knowledge transfer thrives, trust flourishes, and innovation becomes a natural outcome. These elements together form a powerful synergy that propels open health communities to the forefront of healthcare advancement, where the democratization of knowledge and innovative solutions becomes a reality for all.

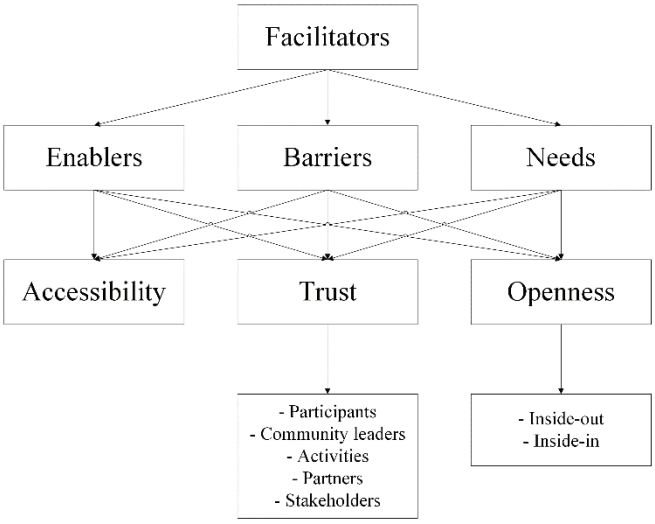


Figure 16. Facilitators of knowledge transfer within the open health communities

Accessibility to the healthcare services is crucially important in facilitating patients' engagement with the healthcare system. When accessibility to medical care encounters challenges, such as extended waiting times, high costs, and the growing prominence of private, fee-based services, individuals often explore alternative avenues for fulfilling their healthcare needs. One such alternative is participation in the open health communities, which serve as inclusive platforms for health-related interactions and knowledge exchange. The effective functioning of open health communities hinges on several key factors. First and foremost, these communities must be public and openly accessible. Their visibility and ease of entry are very important. As these communities become more widely accessible, their popularity naturally surges, resulting in a positive feedback loop that reinforces the option of

accessibility: [P07] "*I like the availability of information (in the community)*", [P14] "*So, it is very important that the information is structured, easily accessible, easily encrypted. If I'm looking for answers about diseases, I want a specific answer*", [P25] *"(the bank of the knowledge, created by the communities) It is clearly very useful, it just has to be easily accessible and interestingly presented*", [P26] "*The doctor actually recommended it (community) to me, she says find a community, you will see how many young persons with heart diseases there are. That's when I found it, I think anyone can find links, although it wasn't easy to find, I didn't know what exactly to look for at the beginning*".

The challenges in traditional healthcare systems can act as catalysts for individuals to seek out open health communities. For instance, when patients encounter long queues and delays in obtaining care within the conventional healthcare framework, they may be compelled to explore alternative sources of information, support, and advice: [P10] "… *it would be relevant to have such an easily accessible platform where people could write to the doctor a questions they had at that time online, and could get an answer immediately, instead of waiting in a long live queue at the hospital reception or during the visit*", [P21] "*It is easier to get information (in the community) than to see a doctor. We all know how long the queues are*", [P24] "… *the medical sector participates as much as we push it*". Additionally, the financial burden associated with the healthcare expenses can drive individuals towards open health communities, where they may find cost-effective or free resources and guidance. Furthermore, the proliferation of private healthcare services, which often come at a premium cost, can prompt individuals to explore open health communities as more economically viable options: [P01] "… *private classes can also be paid for, here (in the community) as far as I know, completely free*", [P03] "*If the seminars are paid only, they are not cheap financially, e.g., 20 EUR one seminar. So, we're looking to make the sessions (in the community) free*", [P20] "… *healthcare professionals sometimes participate in discussions, but they only offer online (paid) private training and lectures. But they don't share information for free in the community discussions themselves*". These communities should offer a space where individuals can access a wealth of health-related information and engage with a diverse network of peers, patients, caregivers, and healthcare enthusiasts without incurring substantial expenses.

Moreover, the significance of accessibility to open health communities is underscored by the inherent benefits they provide. These communities foster a sense of inclusivity, empowering individuals to actively participate in their healthcare journey: [P17] "… *in the community, you can answer the questions that have arisen in advance; when you encounter a certain problem that has already been discussed in the community, it (the situation) will no longer be a 'surprise', because the situation will have been thought of beforehand*", [P22] "… *the patient in the community understands that she is not alone with her problem, a sense of community emerges*", [P25] "*After discussing with members of the community, I feel calmer, get rid of anxiety, and know that I have received an answer. I have noticed that the community is sometimes approached by people who go through unnecessary burden and often get lost in the maze of information, but the community welcomes members warmly and*

tries to reassure, support, and point in the right direction or explain in detail ways to solve a problem". The open health communities offer a platform for sharing experiences, exchanging knowledge, and seeking support from a global community of individuals who share similar health concerns or interests.

The accessibility of medical care profoundly influences individuals' healthcare choices and behaviours. When faced with barriers in traditional healthcare settings, open health communities emerge as attractive alternatives: [P26] "… *there are people who ... use health communities and groups only when they do not find help or an answer in treatment facilities*". It is imperative that these communities remain openly accessible and publicly recognized to continue serving as valuable resources for those seeking health-related information, support, and engagement: [P28] "*Maybe this is the main reason why so many people get involved. Sometimes, things happen where you don't call the hospital or wait a week to go to the family doctor. Or if you have simple questions, why don't you ask about the breast pump on the emergency number [smiles]. You share it, you listen, you get an answer quickly ... I think so, any kind of information, if it is spread properly and is positive, changes understanding and knowledge about health*", [P29] "… *the availability of knowledge and the opportunity to share it in the community changes the patient's knowledge about health issues, because she can compare her situation with others, she can understand her health better, she knows better which specialists to turn to when certain things happen. Of course, it can change for the worse if you listen to nonsense. But basically, I think it's really useful for an intelligent person, because I don't know where else to look for that kind of information*". The increasing popularity of open health communities is a testament to their importance in addressing accessibility challenges within the healthcare landscape.

However, if open health communities operate in relative obscurity and lack promotion or widespread recognition, the transfer of information from these communities becomes severely limited. Essentially, if these communities remain hidden in the shadows, their valuable insights, experiences, and knowledge may largely go unnoticed and fail to reach broader audiences, both within and outside the healthcare ecosystem.

The effectiveness of knowledge transfer within the open health communities is intimately tied to their visibility. When more individuals actively engage in these communities, the exchange of information becomes more successful and meaningful. This engagement serves as a catalyst for knowledge to flow freely, spurring innovation and advancement in healthcare. Communities that struggle with accessibility issues encounter a unique set of challenges; thus, several negative consequences arise: the scarcity of community members hampers the dissemination of critical health-related information. As a result, valuable insights remain confined to a small, isolated group, and their potential to drive broader innovation is squandered. Accessibility barriers can erode trust in these communities. When individuals cannot easily access and verify the information and experiences that are shared within these spaces, they may develop scepticism or reservations, hindering meaningful engagement. The absence of fresh perspectives and a diverse membership

base can lead to stagnation within these communities. Without a steady influx of new ideas and experiences, the community's ability to generate innovative solutions is compromised. Ultimately, when information remains confined within inaccessible communities, it fails to contribute to broader healthcare innovation. Innovative ideas and solutions often require collaboration with a wider range of stakeholders to reach their full potential.

In contrast, when open health communities are easily discoverable and welcoming, they become kind of hubs of innovation. As more individuals participate, they bring diverse knowledge and experiences to the table, fuelling dynamic discussions and collaborative problem-solving. The trust and engagement fostered in such communities promote the sharing of reliable information, which can lead to groundbreaking discoveries and advancements in the healthcare.

Trust is undeniably a cornerstone in catalysing the exchange of reliable information within the open health communities. In essence, knowledge transfer within these communities hinges profoundly on trust. This trust encompasses various dimensions, encompassing trust between the participants, trust in community leaders, trust in the activities undertaken by the community, trust in partnering entities associated with the community, and trust in the broader stakeholders that are involved. The significance of trust within the open health communities cannot be overstated. It appears that interviewees underscore trust as the foremost factor influencing their engagement with health-related issues. This trust factor resonates as the topmost priority in their assessments.

Indeed, trust in medical experts often serves as a cornerstone of decision-making in healthcare. However, open health communities play a unique and valuable role precisely, because they provide a platform for knowledge creation and sharing when traditional medical experts, as it mentioned before, are not easily accessible.

The central role of trust as a facilitator for successful knowledge transfer within the open health communities becomes evident. It is not merely an important factor but arguably the most pivotal one: [P10] "*For me personally, it is very important that the source from which I get information are reliable and trustworthy*". Trust acts as the glue that binds participants, leaders, partners, and stakeholders together, enabling the smooth flow of knowledge and information, which in turn fosters the realization of success within these dynamic healthcare-oriented communities. In the intricate landscape of these communities, where health insights, experiences, and expertise are shared openly, trust assumes a multi-dimensional role. This trust encompasses several key facets.

Trust between the participants, at its core, is trust that manifests as the belief that fellow community members are reliable and genuinely interested in the common goal of improving health outcomes. This trust enables individuals to openly share their experiences, questions, and knowledge, knowing that their contributions will be valued and respected. Trust implies that individuals can rely on their peers within the community: [P18] "*I trust a few members of the community with whom we have communicated, but certainly not all the existing members*". They have confidence that is promised to be kept, information to be accurate, and commitments to be honoured.

This reliability is vital in the healthcare contexts, where misinformation or unfulfilled commitments can have serious consequences: [P27] "*Some of them inspire confidence, some don't ... there are girls who have pushed the limits [in plastic surgery] ... they no longer inspire confidence ... but where they share intelligently, it clearly inspires confidence, and there are those who do a lot of interviewing, collecting information, and they share it, it's great for people like me, it's golden work here, great girls*". Trust is rooted in the belief that everyone within the community shares a common purpose: in this case, the improvement of health outcomes: [P17] "*I have no reason not to trust people who come to the community to improve their knowledge ... after all, everyone has their own experience, that's what they share*", [P25] "*… after noticing more than one past or present specialist who can specifically help in the event of a specific problem. This adds a lot of trust to the community and the information it provides. ... I have a lot of trust in the community and its members. Sometimes, I learn more than I could from a doctor*". This shared goal creates a sense of unity and a collective commitment that transcends individual interests. Trust liberates individuals to openly share their experiences, questions, and knowledge without hesitation. They know that their contributions will be met with respect and appreciation. This openness to sharing personal experiences is particularly significant in healthcare, where real-life anecdotes often hold immense value in understanding conditions and treatments. Trust as well fosters psychological safety within the community. The members feel comfortable by expressing their vulnerabilities, uncertainties, and concerns, knowing that they will not be judged or stigmatized: [P1] "*That's why I like participating in the community, because you feel supported ... very interesting, because you feel you are not alone*", [P17] "*Anyway, sometimes, we still discuss, talk to each other when you find common problems, it is important that you feel not alone*", [P24] "*You get a lot of answers, you see other people's questions that you might not have even thought about, you get answers that you really needed. You see many examples of how people have succeeded, what paths they have gone through, you see a lot of pain, but then a lot of joy. Somehow together you feel stronger, there is support, it is easier to make a decision*", [P25] "*The community helps a lot because it brings like-minded people together in one place. They understand you because there is unity and understanding for someone with a disease that others also have. Feel not alone. They delve into your problem, respond, and you get an answer that you can't get anywhere else so quickly. You get not only a community, but also support, I would even say friends*". This psychological safety is crucial for addressing sensitive health issues and promoting candid discussions. When trust prevails, it motivates active participation. The members are more likely to engage in discussions, collaborate on projects, and provide feedback: [P25] "*I feel happy to be able to share my experience with others who may be going through the same thing as me, I completely understand them and want to help them. [I expect] To improve other people's lives and ease their path of illness*". This heightened level of engagement fuels the community's vitality and its ability to make collective decisions and drive initiatives forward. Trust encourages diversity of thought and background within the community. Individuals from various paths of life and with different perspectives are welcomed and valued,

as their unique insights contribute to a more comprehensive understanding of health-related topics.

Trust in community leaders is a fundamental aspect of the dynamic within the open health communities. These leaders play a pivotal role in shaping the community's ethos, facilitating meaningful interactions, and ensuring that the community thrives as a safe and constructive space for all the participants. Community leaders often guide discussions, set the tone, and ensure that the community remains a safe and constructive space: [P12] "*You can write an article, if you want, you can ask something, but if it doesn't meet the rules, where she [community leader] creates something, it doesn't allow publication. She only confirms whether she can go there or not*". Leaders set the tone for the entire community. Their behaviour and communication style influences how members interact with one another. When participants trust their leaders, they are more likely to emulate the respectful and constructive tone set by these leaders. This tone in turn fosters a welcoming environment that encourages open dialogue and knowledge sharing. Trust in community leaders is closely tied to the belief that these leaders will enforce community guidelines and policies consistently: [P27] "… *the administrator [leader] actively writes, and there are girls who really have a lot of experience, they express themselves very actively, this is confidence*". This enforcement is crucial for maintaining a safe space where individuals can express their thoughts and experiences without fear of harassment or discrimination. In such an environment, participants are more willing to share their knowledge and personal stories openly: [P22] "*Anyway, the admin actively filters out unreliable members and quickly removes inappropriate participants from the community, but not everyone is trustworthy*". When participants have faith in the integrity and competence of these leaders, it fosters an environment that is conducive to open dialogue and knowledge sharing. Perhaps, most importantly, trust in community leaders encourages active participation: [P29] "*Since our administrator [leader] is also open, the community is also active, and somehow everything works: I don't know if there is a specific process, but it seems to work quite well*". When participants believe that leaders are genuinely invested in the community's mission and its members' well-being, they are more likely to engage in discussions, contribute their expertise, and support one another. This active participation enriches the community's knowledge base.

Trust in the activities organized by the community is as well vital for sustained engagement. Members must believe that these activities are well-structured, purposeful, and aligned with the community's objectives. Members want to know that their contributions, whether it is time, expertise, or resources, are put to good use in a manner that benefits the community as a whole: [P23] "*Unfortunately, there is not yet a clear process in the community … I think so, because with more knowledge, and clear process, it would be easier to create something more than what we have created now*", [P24] "*We think too little about new ideas on how to do something better. But it would be good if some kind of structure appeared, when I'm talking now, I think that I've seen rules and other things in other groups, but we don't have them, so we need to sit down and think about it, it would be nice to create something really useful*

from what we're talking about, because I know and we have a lot of experience in this". A history of well-organized and purposeful activities can build trust over time. Positive past experiences contribute to members' confidence that future activities will as well be rewarding and meaningful: [P25] "*There must be someone responsible, perhaps, who must then take it and lead it to the end... It must appear in some clear form*". This trust encourages active participation in events, discussions, and collaborative projects. Trust in community activities is a dynamic process that encompasses the belief that the community's efforts are purposeful, well-structured, and beneficial to its members. This trust not only encourages active participation in events, discussions, and collaborative projects but as well reinforces the sense of belonging and shared purpose within the community. It fosters a positive feedback loop where engaged members contribute to the success of the community, which in turn further enhances trust and engagement.

Many open health communities collaborate with external partners, such as healthcare organizations, research institutions, or advocacy groups. **Trust in** these **partner entities** is as well important, as it influences whether members are willing to engage with these partners and leverage their resources and expertise. However, it is another step after the trust is found inside the community. Moreover, **trust** extends **to** the broader **network of stakeholders** connected to the community, including healthcare professionals, policymakers, and industry representatives. When participants have confidence in these stakeholders' commitment to the community's mission, it can lead to fruitful collaborations and knowledge exchange.

The significance of trust in the open health communities is further underscored by the interviewees' perspectives. It becomes evident that trust is not just one of several factors but often the primary consideration for individuals when engaging with health-related issues within these communities. This trust factor extends beyond mere reliability; it encompasses the emotional and psychological assurance that individuals gain from their interactions within these communities. The central role of trust as a facilitator of successful knowledge transfer in open health communities is crucial. It engenders an environment where individuals feel secure in sharing their knowledge, experiences, and questions, thus driving the collective effort towards the common goal of advancing healthcare and well-being. Trust is the linchpin upon which the transformative potential of these communities hinges, making it a cornerstone of their success.

Openness of the community can be delineated into two fundamental dimensions. Firstly, it encompasses the ease with which individuals can access and become part of the community. Secondly, it extends to the community's willingness to engage with external entities and its permeability to information flows across its boundaries. These two dimensions serve as critical indicators of a community's developmental maturity and its commitment to knowledge acquisition, innovation, and collaboration.

The accessibility factor, which represents the first dimension, holds a high importance within the context of community dynamics. An easily accessible community offers several advantages. It serves as a gateway for a broader and more

diverse pool of participants, strengthening the community's internal dynamics and capabilities: [P20] "*Anyone who wants to can join the community ... It's important because you learn useful information, but you also get support and reassurance*", [P25] "*Yes, there are no criteria or requirements ... I feel heard, my help, opinion, and experience are valued. It's nice to help someone in need*", [P29] "*The community is very friendly and anyone can join. Of course, the administrator confirms it, it seems to me, it's not like anything goes, but anyway, basically, there's no reason why you couldn't if you really connect*". Such inclusivity fosters an environment where a multitude of voices, perspectives, and expertise converge, ultimately contributing to a more robust collective knowledge reservoir.

In this research, it becomes evident that some of the communities, despite labelling themselves as "open", still impose certain eligibility criteria for membership. These criteria often revolve around specific health issues and other contextual factors. This selective approach to membership can serve various purposes within the community. Requiring members to have a specific health issue ensures that the community remains focused and aligned with its intended purpose: [P23] "*Basically, yes, of course [everyone can join], but there is always an effort to select so that people are interested in communicating, interested in discussing this disease*". It allows participants to share experiences, knowledge, and support related to that particular health concern, which can be more valuable than generalized discussions.

Some communities adopt a more exclusive approach to protect the privacy and comfort of their members. For instance, pregnancy groups that are restricted to individuals of a specific sex (typically women) create a safe space for open discussions about pregnancy-related issues, where members may feel more at ease: [P17] "*Not really, because you have to be pregnant anyway, and I actually don't know if women from other hospitals can join, because I'm visiting this one, and they suggested it to me*", [P18] "*… women come with their husbands as well, and there are lectures especially for fathers, but it's probably not the idea of someone coming from the street to ask about pregnancy*", [P19] "*It is mainly pregnant women, and their husbands can also join, for whom it is interesting and useful*". Restricting membership based on the specific criteria can enhance the quality of engagement within the community: [P30] "*Basically, yes, but it has to be relevant to people or have had surgeries and such*". Members who share a common health issue or experience are often more actively involved in discussions, which can lead to richer and more meaningful exchanges: [P03] "*The main positive factor is that we all have the same problems. Various concerns arise, all living with the same questions*". In certain communities, requiring specific criteria can ensure that members have a certain level of expertise or personal experience related to the health issue: [P04] "*I think that the most useful would be a platform where would be opinions and experiences of doctors and specialists on specific issues, or on the most common issues*", [P22] "*I think it's just useful that there are like-minded people, especially after operations, when people are going through various complications, everything is new to them, then they share in a group, they get a lot of advice on what to do, where to go to get better ... Only the rules of the group itself state that the entire group is*

only about plastic surgery and that sharing unrelated content or any solicitation is strictly prohibited". This enhances the reliability of information shared within the community. Selective criteria can as well contribute to the formation of a distinct community identity. Members feel a sense of belonging when they share a common health concern or identity, and this can foster a supportive and empathetic atmosphere. Moreover, many communities choose to enforce rules against advertising and sales to maintain a non-commercial atmosphere. This helps prevent the community from becoming inundated with promotional content, ensuring that discussions remain focused on sharing knowledge and support: [P28] "… *now, the community lacks the feeling that information is shared honestly, without personal gain or sales (drugs, supplement distributors, personal trainers, etc.)*". If implementing criteria, communities can reduce the likelihood of spammers or individuals with malicious intent of joining the group. This helps to maintain a constructive and trustworthy environment.

It is essential to recognize that while these selective criteria can have valuable benefits, they as well present challenges related to the inclusivity and diversity. Striking a balance between maintaining a focused and supportive community and being inclusive of diverse perspectives can be a delicate task. Communities should continually evaluate their criteria and rules to ensure that they align with their core objectives while as well fostering a sense of openness and inclusivity where appropriate.

In contrast, the second dimension of community openness pertains to its readiness to engage with external sources of information and knowledge. This facet signifies the community's maturity and signifies its proactive stance towards knowledge enhancement. An open community actively seeks knowledge from external entities, thereby diversifying its informational and intellectual resources. It actively seeks opportunities to form partnerships with entities representing varying viewpoints and expertise, thereby enriching the breadth and depth of its discussions and activities. This willingness to receive information from multiple sources, including external ideas, models, and data, enhances the community's capacity to innovate and address complex challenges effectively.

Moreover, the notion of "outside-in" open innovation, a manifestation of this second dimension, underscores the community's commitment to knowledge acquisition. Communities that engage in "outside-in" innovation actively seek to glean insights and best practices from the external sources: [P29] "*It really is possible, I saw the administrator sharing all kinds of offers from the clinics, and as I said, the trainer is active, and there are also all kinds of initiatives, seminars, etc., where the community is willing to cooperate, you can really see it*". This approach broadens their knowledge horizons as well as positions them as dynamic entities that continuously adapt and grow. The observation of examined communities shows that they lack strong connections with outside entities while still partnering with businesses and academia or other entities: [P18] "*I don't know a lot, but with science, they showed that article, and they showed the textbook that they had published, so there are probably more people involved... We get all kinds of samples of creams and the like,*

so maybe, the business is slowing down somehow", [P19] "*We receive all kinds of gifts from businesses, they contribute to participation, sometimes, you have to fill out questionnaires and participate in surveys like this one*", [P26] "*Indeed, if a community-group is created by a topic that is relevant to our group, there is no doubt that some guests related to the same community are involved, as for example, in my case, they are doctors of science, some specialists, pharmacists, and the like*".

Furthermore, the concept of "inside-out" innovation is equally pivotal. It delineates how a community shares knowledge it has cultivated within its boundaries with the wider world: [P23] "*We are shared with several other communities, with whom we have discussed how we can improve what we have created ... I think yes, because there would be more knowledge, it would be easier to create something more than what we have created now*". A community that readily disseminates its accrued wisdom, insights, and innovative solutions to other communities, partnering entities, and the public demonstrates a high level of developmental maturity. Such proactive knowledge sharing not only benefits the immediate community but as well fosters collaboration, learning, and the propagation of the best practices across a broader spectrum: [P28] "*I would see the benefits for our community to share the created knowledge publicly, after all, not all people use the Internet or social networks. So, those who still are looking for information by themselves, that's good, but where can those who don't use such things, what they do, consult? I can't imagine otherwise. Maybe then, if there was some kind of publicity, it would be useful*". The strength and nature of partnerships within the open health communities can vary significantly based on the community's focus and scope. Direct health communities often have well-established, enduring partnerships due to their niche expertise and specific health focus. Broader communities, while offering diversity and potential for growth, may need to work more proactively to identify and nurture partnerships that align with their evolving objectives. Regardless of their scope, the ability to foster meaningful collaborations can significantly enhance the impact and effectiveness of open health communities in advancing healthcare knowledge and outcomes.

In essence, community openness, as outlined, embodies a multidimensional construct that extends beyond mere accessibility. It signifies a community's readiness to embrace external knowledge, engage in collaborative endeavours, and actively share its own expertise with the broader ecosystem. This holistic perspective underscores the role of community openness in promoting knowledge diversification, innovation, and the advancement of best practices, thereby contributing to the collective growth and development of societies and industries.

The interplay is a fundamental catalyst for the democratization of various aspects of society, including knowledge, information, and opportunities. Accessibility is the ease with which individuals can access resources, services, and opportunities. When accessibility is enhanced, it contributes to democratization: ensures that everyone, regardless of physical abilities, economic means, or other factors, can participate fully; accessible platforms and services encourage broader participation and lead to a more representative and diverse engagement in decision-making processes and societal activities; enhanced accessibility spurs innovation by the lead

to the development of new ideas and solutions. Secondly, trust was exposed as the foundation of effective collaboration and engagement. Trust builds connections and fosters a sense of security, which is essential for democratization. People are more willing to work together when they have confidence in each other's intentions and actions. People are more likely to engage in civic activities and express their opinions when they trust that their voices will be heard and respected. Thirdly, when communities adopt an open approach, it breaks down barriers and promotes inclusivity. In the context of democratization, openness facilitates access to a wealth of information and knowledge. Information that was once exclusive or limited becomes available to a wider audience, levelling the playing field. Moreover, openness ensures that individuals from diverse backgrounds, regardless of their socio-economic status or geographic location, can participate and benefit. It fosters an environment where everyone has a voice.

Accessibility, trust, and openness together create an environment where power and resources are distributed more equitably. This environment allows individuals from diverse backgrounds to participate in the decision-making, access essential services, and contribute to the betterment of society. Ultimately, it leads to the democratization of knowledge, opportunities, and decision-making processes, empowering a wider range of people to shape their future.

Interviewed open health community members expressed several key **needs** that align with the facilitators of accessibility, trust, and openness. These needs are integral to their orchestration and engagement within the community, and the realization of their goals. The interviewed open health community members articulated a range of needs that are intricately connected to the facilitators of accessibility, trust, and openness. Additionally, they identified a set of needs centred around leadership, structure, medical staff inclusiveness, processes, action plans, and clear goals. These needs complement and reinforce the facilitators, contributing to a more robust and effective community environment.

Members of different open health communities expressed a need for strong and visionary leadership that provides clear guidance and direction. **Effective leadership** ensures that the community remains orchestrated and focused on its objectives and values: [P21] "*I think, at the beginning, there should be some kind of initiative, a responsible person, and the most important thing is to bring other people together, to keep them for a long time is really an art and patience, but then joint creativity also appears*", [P22] "*I don't know for sure, there must be organizers of the group at the beginning*", [P24] "*It needs a structure, we need some kind of guidelines as to what we do, we need something, I don't know, a coordinator, I think, a leader*", [P29] "*… team members who would be assigned to take care of organizing the community*". They emphasized the importance of leaders who actively listen to and engage with all the members. **Structure** and **reliability of information** was identified as essential for efficient community functioning: [P14] "*… the reliability of the creators of knowledge is important, specialists should answer, comment ... it is necessary for the information to be structured, easily accessible, easily encrypted*", [P25] "*Information would be transmitted faster and more accurately, or old information could be found*

more conveniently ... People who have personally encountered health problems or have some kind of education. In this way, I would gather around me a circle of people who would share reliable information", [P26] "*I think the public would really get more involved if it wasn't just a dry message launched on the basis of advertising, but also a clear program should somehow attract listeners and interest them*", [P28] "*… more sincerity would help. The participation of science and health specialists in such communities so that we get the correct information from that side*". Members called for a well-organized framework that streamlines activities, discussions, and resource allocation. The interviewees expressed a need for more active **participation of medical staff** who can provide expert insights, answer medical queries, and ensure the accuracy of healthcare information: [P14] "*The most important thing for me would be that specialists commented or answered the questions*", [P28] "*Indeed, the Ministry of Health should contribute more than now [to the activities of health communities] ... Family doctors and people who actually live with those problems could be more involved ... it would be useful to share at public events*", as well as the need to get **information immediately**, "here and now": [P01] "*I need help here and now*", [P02] "*I need this information here and now ... I need consultation with professionals*", [P11] "*I would need a very individual program, where you can get exactly the information you want and you can expand it. I mean, one could go from a general question to very fine details. It would be best to get direct advice from your doctor here and now when you need it*", [P30] "*I think the specialists who join our meetings could help. There is a really active organizer in our community, so maybe, she just doesn't know how to do it, or it's clear that this is an additional activity for a person, but if there was such an initiator, I think she could do a lot of work*". In order to drive innovation and problem-solving, people desired **concrete action plans and active initiatives**. Actionable steps help the community to move from discussions to tangible outcomes. Streamlined workflows facilitate the quick dissemination of information and the execution of community initiatives. Action plans should be designed with active community engagement in mind: [P17] "*… you need to do it actively somehow, somehow look at the situation in a new way. Now, we get a lot of information from all kinds of social media. Networks and the like, and sometimes, it seems that maybe there is nothing new to create here. But as always, you just have to be interested in it*", [P18] "*… for the fact that it should be organized and then active people involved*", [P19] "*Perhaps, even more specialists could contribute and share their knowledge, or that more people could participate*", [P20] "*Maybe the community should be purposefully activated then*", [P24] "*… there must be active people in the beginning, which we have... This is the basis here. But it turns out that it takes some concentration to turn ideas into something*".

Collectively, these needs reflect a holistic approach to building and sustaining vibrant open health communities. They recognize that while facilitators, such as accessibility, trust, openness, and democratization are critical, they must be supported by effective leadership, organizational structure, medical expertise, well-defined processes, action-oriented plans, and transparent goals. Open health communities can foster an environment by addressing these needs, which promotes knowledge transfer,

innovation, inclusivity, and the democratization of healthcare information to benefit all members and the broader community.

3.4. Knowledge Transfer Influence on Open Health Community-Driven Innovation

Open health communities, as well known as health-related open-source communities, are groups of individuals, often from diverse backgrounds, who collaborate on various aspects of healthcare, medical research, and health technology development. These communities are typically characterized by their transparency, inclusivity, and open sharing of knowledge and resources. The relationships between open health communities, knowledge transfer, and their influence on the outcomes of community-driven innovation are multifaceted.

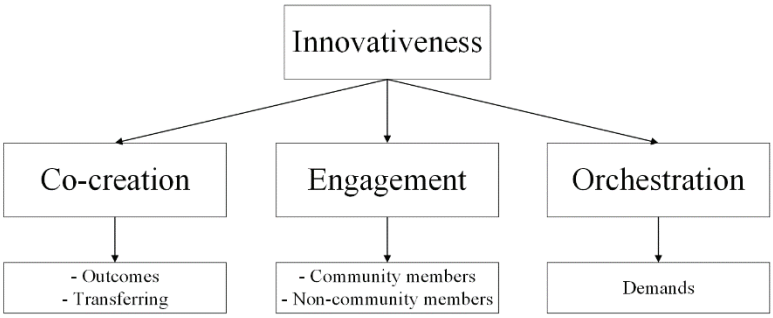


Figure 17. Key innovation practices within the open health communities

Co-created innovation outcomes and transferring to other communities

Community members often reported varying degrees of co-created products or processes within their communities, ranging from none to many. This suggests that the level of collaboration and innovation within these open health communities can vary significantly. While direct health community has revealed about launched products (some communities may be highly active in co-creating products or processes): [P17] "*... [the community has produced] videos, brochures, and a magazine. ... I don't know if it is transmitted to other communities*", [P18] "*They really created some, starting with all the materials they give us, and there, they showed the article after publishing it and also created thematic leaflets ... the staff create who lead the community because I don't know if the members intervene*", [P19] "*I only know that they present various leaflets, show videos they created ... They jointly create knowledge about pregnancy, etc.*". Online communities may not engage in such activities as frequently: [P20] "*Haven't tried building yet, but good idea*", [P21] "*At least it is not known to me ... I don't know if it is passed on to anyone*", [P24] "*Well, now, I realized that the community has created some things... But we probably didn't shaped it. It could be structured …*". Only a single interviewee disclosed that an online community had been established, and it subsequently transferred a product to the other communities: [P23] "*Yes, we created a diet plan and a list of products that can and cannot be eaten. ... No, I'm not sure exactly how it's shared ... but we do share with a*

few other communities that we've discussed with how we can improve what we've created".

Additionally, the fact that many community members did not know if knowledge transfer to other communities occurred highlights a potential gap in information sharing and communication between different communities. Knowledge transfer between communities can be a valuable source of innovation and learning, and it is important for community members to be aware of such activities to foster collaboration and the sharing of the best practices.

This information underscores the need for better knowledge management and communication strategies within the open health communities. Encouraging members to share their experiences and successes in co-creating products or processes can potentially inspire others and lead to more widespread innovation across various communities. Moreover, facilitating knowledge transfer between communities can create a more interconnected network of health innovators, ultimately benefiting the broader healthcare ecosystem.

Engaging community participants in the co-creation of innovations is a fundamental aspect of fostering transformative endeavours within the community ecosystem. This engagement entails a deliberate and inclusive approach aimed at harnessing the collective expertise, experiences, and perspectives of community members in the collaborative generation of novel solutions, practices, or products. Encouraging and facilitating participation in innovation activities can empower community members to take ownership of challenges and actively contribute to their resolution. This sense of agency and empowerment can enhance the overall resilience and self-sufficiency of the community.

Regrettably, interviewees responded that they had not been actively engaged in innovation processes: [P17] "*I don't know if other members were involved, but it really didn't affect me, and I didn't contribute [to the creation of innovations]*". The process involves not only soliciting active participation of community members, but **involving non-community members in the co-creation of innovation** as well: [P18] "… *not much, but it participates with science ... probably business also participates in some way*", [P23] "*Yes, there were nutritionists who gave a lot of advice and knowledge on this matter*", [P24] "… *as you say a product, it can be sold by a business... But of course, our goal is not to sell, but to improve health, but you know, more heads, more ideas, anyone can participate*".

This situation leads to several implications and considerations, as missed opportunities or a major barrier to participate fully. The identified barriers that hinder community or even non-community members from participating in innovation activities show limited awareness, access, or motivation in the participation of open health communities.

Community orchestration for enhanced innovation efficiency revolves around the deliberate and strategic management of community dynamics to optimize the efficiency of innovation processes. It encompasses the coordination, leadership, and facilitation efforts aimed at aligning community resources, expertise, and goals to enhance the effectiveness and speed of innovation initiatives: [P04] "*I think the most*

useful would be a platform where would be doctors' and specialists' opinions, experiences, tutorials and articles, seminar videos on specific issues or the most common issues. This would make it easier to categorise information and use it", [P17] "*I think the community could create innovations more effectively ... it is necessary to engage in it actively somehow, somehow, to look at the situation in a new way. Now, we get a lot of information from all kinds of social media. Networks and the like, and sometimes, it seems that maybe there is nothing new to create here. But it probably always is, you just have to be interested in it*", [P18] "*I think that the community should be activated especially for those questions that we have to create something or to solve some problem with a result ... I am in favour of it being organized, and then active people are all that is needed*", [P19] "*I think that everything is going smoothly anyway ... Perhaps, even more specialists could contribute and share their knowledge, or that more people could participate actively*", [P23] "*I think so, because there would be more knowledge, it would be easier to create something more than what we have created now ... Maybe certain health institutions where these diseases are treated and that would share more practical ways or needs*", [P24] "*… it turns out that it takes some concentration to turn ideas into something. ... We need a structure, we need some kind of guidelines as to what we do, we need something, I don't know maybe a coordinator*". Effective community orchestration involves fostering collaboration, streamlining communication, and ensuring that all stakeholders contribute synergistically to the innovation endeavours. It is a highly important aspect of maximizing the potential of communities as incubators of innovative solutions. **Influence of co-created innovation on health advancements** centres on the profound impact of collaborative, co-created innovation on advancing health and well-being: [P18] "*I think, in the long term, it helps [innovation to improve health], because there is some long-term knowledge that you might use in a situation or pass it on to someone else*", [P21] "*I think, at the beginning, there should be some kind of initiative, a responsible person, and the most important thing is to bring other people together, to keep them for a long time is really an art and patience, but then, co-creativity also appears*", [P25] "*… the innovations that were created help to solve health issues and, probably, help the psychological state of the members the most, that is if they need a quick and reliable answer, they can turn to the community. ... People who have encountered health problems personally or have some kind of education. In this way, I would gather around me a circle of people who would share reliable information*". Co-created innovation fosters a participatory approach, where diverse stakeholders, including healthcare professionals, patients, researchers, and community members, actively collaborate to devise novel strategies, technologies, and practices that enhance healthcare delivery, preventive measures, and overall health outcomes. This collaborative approach is instrumental in shaping the future of healthcare and driving continuous improvements in health services and outcomes.

This study investigated two types of health communities, i.e., direct and digital (online). The settings of each of these types were determined theoretically (Table 2) and empirically. During the theoretical research, the main settings of direct open health communities were identified, such as: direct contact, clear goals, social

responsibility, patient and information security, goals of each participant, but the challenges were highlighted as well: lack of self-confidence, lack of trust between members, inconvenient time and place. Online communities were indicated as sources of information for community members, a supportive environment, regardless of time and place, a wider circle in which knowledge is shared. However, in open online health communities, there is a lack of information security, sensitive ethical and data issues, unclear goals and sharing for no reason, and there are significant differences in values.

Complementing the results of the theoretical research, the parameters of the communities were investigated empirically as well. The data obtained during the research confirmed the parameters of open health communities and their differences. However, it revealed more parameters that are important to the study participants. Research participants indicated that the parameters of both types of communities are important. The hybrid type of health communities during the empirical study were developed. This hybrid community likely incorporates elements or parameters from both open and another type of health communities, creating a novel and potentially more effective community model. Some potential elements and parameters that could be considered when creating a hybrid health community: openness, accessibility, privacy, safety, expert guidance, peer support, moderation, community events, continuity, feedback, customization, clear vision, and goals. The specific combination and balance of these elements and parameters will vary depending on the context and goals of the hybrid health community. The key is to create a community model that maximizes the benefits of both open and other types of health communities while addressing the unique needs and preferences of the community's target audience.

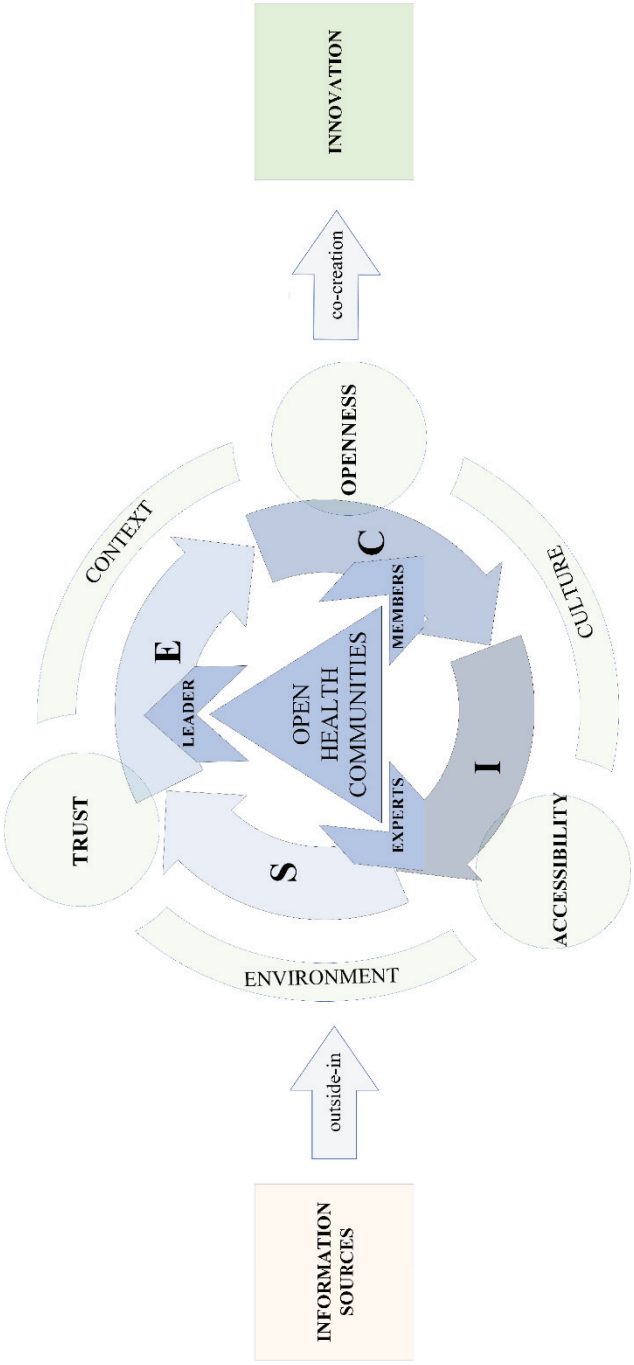


Figure 18. Established knowledge transfer model for open health communities

In the realm of growing digital health settings, the demand for effective knowledge transfer within the open health communities has become highly important. The model not only addresses the challenges inherent in the open knowledge-sharing environments but as well leverages emerging technologies to enhance the efficiency and reliability of information dissemination.

Open health communities play an active role in disseminating knowledge among diverse stakeholders, including researchers, healthcare professionals, and the general public. However, the unstructured nature of information exchange in such communities often leads to the challenges in knowledge transfer, validation, and assimilation. In order to bridge this gap, the proposed model integrates established principles from management sciences, organizational behaviour theory.

Knowledge transfer is facilitated through a community-driven curation system, where members collaboratively curate and validate information. This not only enhances the accuracy of the shared knowledge but fosters a sense of ownership and collaboration among community participants as well. It highlights the improvements in information accuracy, user engagement, and the overall quality of knowledge exchange. The established knowledge transfer model for open health communities represents a significant advancement in addressing the challenges associated with knowledge transfer in open health communities. Combining community-driven curation, the model establishes a foundation for efficient and reliable information exchange, fostering a collaborative environment for advancing health-related knowledge. The knowledge transfer model in open health communities (Figure 18), taking into account the unique characteristics of each community type within this domain.

The flow from information sources to society through the lenses of outside-in innovation, the open health community, the SECI model, and other factors can be conceptualized as a dynamic and iterative process that contributes to the societal innovation and progress. Information sources serve as the starting point for the innovation journey. These sources may include scientific research, technological advancements, healthcare data, and insights from diverse fields. These sources provide the foundational knowledge that informs the innovation process. The concept of outside-in innovation involves incorporating external ideas, perspectives, and knowledge into the innovation process. In the context of open health communities, this entails actively seeking and integrating insights from external sources, such as global health trends, cutting-edge research, and innovative practices from other communities. The open health community serves as a platform for the exchange of information and ideas among diverse stakeholders, including community players, healthcare professionals, researchers, and individuals with lived experiences.

In the endeavour of establishing novel open health communities or reorganizing existing ones, the present study advocates emphatically for a purposeful emphasis on the formulation and implementation of a hybrid open health community model. This hybrid (mixed) model is intricately designed to systematically address therequirements and aspirations of its constituents. Comprising a comprehensive array of parameters that span diverse dimensions, the hybrid open health community model

encompasses continuity, common goals, trust and confidence, patient safety and ethical principles, engagement, clear responsibilities, and a sense of belonging and social connection.

In the optimal configuration of hybrid open health communities, the roles of leaders, medical experts, and members are distinctly defined, each contributing to the synergy of the community's functionality and fostering a collaborative and effective healthcare organization. Leaders play a primary role in steering the hybrid open health community towards its overarching goals. Ideally, leaders possess a multifaceted skill set, encompassing strategic vision, effective communication, and adaptive decision-making. They are responsible for setting the tone and direction of the community, ensuring alignment with its objectives, and cultivating an environment of inclusivity and shared purpose. Leaders should as well demonstrate a commitment to transparency, fostering trust among members. Their leadership style should be adaptive, recognizing the dynamic nature of healthcare and promoting innovation and continuous improvement within the community.

Medical experts within hybrid open health communities are the background of knowledge and expertise. They contribute by providing evidence-based insights, staying abreast of the latest developments in healthcare, and offering guidance on the best practices. These experts may lead discussions, share research findings, and provide valuable educational content to empower community members. The collaboration between medical experts and community members is encouraged, creating a symbiotic relationship where the expertise of healthcare professionals is complemented by the real-world experiences and insights of the community members. Continuous professional development and knowledge sharing among medical experts contribute to the community's overall growth and effectiveness.

The members of hybrid open health communities are active participants in the collective healthcare journey. Ideally, they are engaged, informed, and motivated to contribute to the community's objectives. The members may share their personal experiences, seek advice, and actively participate in discussions and initiatives. The community provides a platform for members to voice their concerns, offer suggestions, and actively contribute to the decision-making processes. In an ideal scenario, community members feel a sense of ownership, fostering a culture of collaboration and mutual support. Diverse perspectives from members, representing various backgrounds and experiences, enrich the community's knowledge base and contribute to the innovative solutions.

Effective communication and collaboration are essential cornerstones in the ideal state of open health communities. Leaders, medical experts, and members should communicate openly and transparently, ensuring that information flows seamlessly. Regular forums, both online and in-person, should be established to facilitate dialogue and collaboration. Virtual platforms should be leveraged to enable continuous engagement, allowing members to connect, share information, and collaborate irrespective of geographical boundaries. The community's structure should encourage interdisciplinary collaboration, fostering a holistic approach to healthcare challenges. The ideal state of hybrid open health communities is characterized by strong

leadership, informed medical expertise, and active and engaged community members. The collaborative efforts of these stakeholders contribute to a dynamic and responsive healthcare community that is adaptive, innovative, and dedicated to improving health outcomes for all its members.

Patient safety and ethical principles are integral components of the hybrid model, underscoring the commitment to the well-being of community members. Engagement is facilitated through the provision of both online and in-person participation options, ensuring accessibility and inclusivity. Clear delineation of responsibilities within the community is encouraged motivating members to assume specific roles and fulfil their obligations, thereby promoting a sense of accountability and ownership.

Continuity within the context of the hybrid open health community model ensures the prolonged existence and sustainability of the community's operations over time. The establishment of common goals is imperative, delineating tangible objectives and outcomes for the community, while fostering a shared sense of purpose and direction among its members. Trust and confidence are fundamental elements, contributing to the overall efficacy of the community model, instilling a sense of reliability and assurance among its participants.

The model's effectiveness is further heightened through meticulous orchestration, which serves to elucidate members' roles, cultivate high levels of trust, and foster a culture of openness. The realization of a democratic element within the community contributes to the development of a robust knowledge base, as diverse perspectives and expertise are actively embraced and integrated.

Trust is foundational to the success of hybrid open health communities. In an ideal setting, leaders inspire trust through transparent communication, consistent decision-making, and a commitment to the community's shared values. Trust extends to the medical experts who in turn establish credibility by providing accurate and reliable information. Members should feel confident that their contributions are valued and the community operates with their best interests in mind. Trust as well extends horizontally among community members, promoting a collaborative and supportive network. Regular feedback mechanisms, ethical practices, and demonstrated competence contribute to a culture of trust within the community.

Openness within hybrid open health communities is characterized by a culture that encourages free flow of information, ideas, and perspectives. Leaders should foster an environment where members feel comfortable expressing their opinions, sharing experiences, and proposing innovative solutions. Medical experts should actively engage in open dialogue, presenting evidence-based insights and welcoming diverse viewpoints. Transparent decision-making processes and readily accessible information contribute to a sense of openness. Community members in turn embrace a culture of transparency, sharing their experiences openly and contributing to the collective knowledge base. Openness cultivates a culture of continuous learning and adaptation to new information.

Ideal hybrid open health communities prioritize accessibility on multiple fronts. Leaders should ensure that communication channels are easily accessible, providing

multiple avenues for engagement, including both online platforms and in-person opportunities. Medical experts should make their expertise accessible through various formats, such as webinars, written materials, and interactive sessions. Accessibility as well extends to the community members, ensuring that they can easily participate and access relevant information regardless of their background or geographical location. In an ideal scenario, the community employs inclusive practices, accommodating the diverse needs and making resources available to all members.

A critical component of accessibility in hybrid open health communities is the effective use of technology. Online platforms should be user-friendly and equipped with features that enhance engagement, such as forums, webinars, and collaborative tools. Accessibility considerations should as well extend to those with varying levels of technological proficiency, ensuring that the community remains inclusive and reaches a broad audience.

Indeed, the success and effectiveness of open health communities are intricately intertwined with the cultural, contextual, and environmental factors in which they operate. These elements significantly shape the dynamics, engagement, and outcomes of such communities.

Cultural considerations determine the nature and functioning of open health communities. Cultural norms, values, and beliefs influence how individuals perceive health, wellness, and community participation. The success of an open health community relies on its ability to align with and respect cultural diversity. Community leaders and members must be sensitive to the cultural nuances, ensuring that communication styles, health practices, and community initiatives resonate with the cultural fabric of the participants. An inclusive approach that values and incorporates diverse cultural perspectives contributes to a more meaningful and effective community.

The success of open health communities is contingent on their relevance to the specific context in which they operate. Local healthcare needs, prevailing health challenges, and existing healthcare infrastructure shape the priorities and focus areas of the community. Understanding the unique contextual factors allows community leaders and members to tailor interventions, communication strategies, and collaborative initiatives to address specific health concerns. A community that is attuned to the local context is more likely to garner support and active participation from its members.

The environmental context, including both physical and socio-economic factors, plays a crucial role in determining the feasibility and impact of open health communities. Geographical factors, such as urban or rural settings, influence access to the healthcare resources, technology, and community engagement opportunities. Socio-economic conditions impact the availability of time, resources, and the overall health literacy of community members. Successful open health communities recognize and adapt to these environmental factors, leveraging available resources while addressing barriers to the participation. Environmental considerations as well extend to broader issues, such as policy frameworks and support from the local institutions. In the contemporary landscape, the technological environment is a key

factor in the success of open health communities. The availability of digital platforms, Internet access, and technological literacy greatly influences the community's ability to connect, share information, and collaborate effectively. Accessible and user-friendly technology enhances community engagement, especially in settings where in-person interactions may be limited. Conversely, a lack of technological infrastructure can pose challenges, requiring innovative solutions to ensure inclusivity.

The success of open health communities is heavily dependent on effective leadership and governance structures. Leaders who understand and respond to the cultural, contextual, and environmental nuances create an environment conducive to community growth. Governance mechanisms that foster transparency, accountability, and inclusivity contribute to a sense of trust and belonging among the community members.

The adoption and implementation of a hybrid open health community model demonstrate a strategic approach that not only attends to the fundamental needs of its members but significantly contributes to the establishment of a resilient and knowledge-rich community within the healthcare domain as well. Central to facilitating knowledge transformation within this model is the application of the SECI (Socialization, Externalization, Combination, Internalization) model, which provides a structured framework for converting information into valuable knowledge, offering support mechanisms at each stage of the process. The SECI model, which stands for Socialization, Externalization, Combination, and Internalization, is a knowledge creation and sharing framework. In the context of open health communities, this model reflects the dynamic process through which tacit and explicit knowledge is shared and transformed. Socialization involves sharing experiences and building a shared understanding within the community. Externalization involves articulating tacit knowledge into explicit forms that can be disseminated. Combination is the synthesis of different knowledge elements, and Internalization is the incorporation of shared knowledge into the community's practices. The SECI model facilitates the efficient flow of knowledge within the open health community.

However, empirical research reveals a noteworthy incongruity between the theoretical underpinnings of the SECI model and its practical application within the open health communities. A comprehensive analysis of the individual components of the SECI process exposes that various health communities often adopt different elements of the model, at times deviating from the prescribed sequential order or bypassing certain stages entirely. A significant discovery of this study centres around the critical junctures between the stages of the SECI process, shedding light on the challenges encountered by the open health communities in advancing through subsequent stages of knowledge creation. Notably, a common hurdle emerges as many open health communities tend to stall after the second stage, Externalization (E). This stagnation is attributed to the lack of coordination within the knowledge transfer process, resulting in a deficit of individuals adept at "harvesting" and consolidating the generated knowledge.

In order to delve deeper into this issue, it becomes imperative to examine the specific challenges that impede the progression beyond the Externalization stage. The intricacies of coordinating and consolidating knowledge demand skilled individuals who can synthesize diverse insights, distil tacit knowledge into explicit forms, and strategically disseminate this knowledge throughout the community. A deficiency in this coordination aspect hinders the seamless flow of knowledge, limiting the community's capacity to fully leverage the transformative potential of the SECI model. Community leaders must prioritize the development of robust coordination mechanisms, identifying individuals with the capacity to bridge the gap between the Externalization and Combination stages. The strategies may include: targeted training programs, mentorship initiatives, and the establishment of dedicated roles to facilitate the effective harvesting and consolidation of knowledge. Moreover, fostering a culture of collaboration and recognizing the value of knowledge management within the community are integral aspects of overcoming this bottleneck.

Orchestration involves the careful organization and coordination of resources, activities, and stakeholders to achieve a harmonious and innovative community ecosystem. Effective leadership and governance structures are essential for orchestrating the diverse assets within the open health community. This orchestration leads to innovativeness within the community, where ideas are cultivated, tested, and implemented to address the health challenges and improve the outcomes. Orchestration involves the strategic organization of resources and activities within the community. The gaps in orchestration may result in a disjointed and ineffective community structure. In order to address these gaps, there is a need for leadership that can harmonize the diverse elements within the community, promoting collaboration and ensuring that resources are utilized efficiently to drive innovation and knowledge transfer.

The inside-out perspective involves taking the innovations and insights that were generated within the open health community and applying them to the broader societal context. Successful innovations may include new healthcare practices, technological solutions, or community-based interventions. As these innovations mature, they have the potential to positively impact society at large, influencing healthcare systems, public policies, and societal attitudes towards health and well-being.

In summary, the journey from information sources to societal impact involves a dynamic interplay between external insights, community dynamics, knowledge creation, and effective orchestration within the open health communities. Navigating these stages thoughtfully, the innovations generated within these communities have the potential to contribute significantly to the positive societal change in the realm of health and well-being.

The breakdown within the open health communities can be attributed to the several critical factors, each of which poses distinct challenges to the effective functioning of these collaborative networks. These factors include leadership deficiency, orchestration gaps, lack of clear objectives, facilitator performance issues, and trust and openness issues. Addressing these challenges is essential for fostering a

resilient and thriving open health community. Furthermore, recognizing the intricate dynamics inherent in these communities underscores the need for a tailored hybrid model that can adapt to their unique requirements.

In the context of addressing these challenges, the SECI model (Socialization, Externalization, Combination, Internalization) emerges as a valuable framework for knowledge transfer within the open health communities. However, the practical application may deviate from the theoretical ideals. Therefore, careful consideration and adaptability are essential when implementing the SECI model. Understanding the pivotal junctures in knowledge creation and addressing the challenges related to leadership, coordination, and trust are critical steps for the success and resilience of open health communities.

In conclusion, by addressing these critical factors and embracing a tailored hybrid model that incorporates the principles of the SECI model, open health communities can navigate the challenges effectively, foster a collaborative environment, and ultimately contribute to the advancement of knowledge and innovation in the realm of healthcare.

4. DISCUSSION OF THE RESEARCH FINDINGS

In the modern evolving world, the problem of patients integration becomes more and more relevant. The field of public health has attained an unprecedented level of popularity and interest among individuals. They are first to have the experiential knowledge and notice the everyday challenges of the health issues better (Castro et al., 2019; Marmot et al., 2012). There is a noticeable surge in people's curiosity and concern for health-related matters: a trend that transcends various sectors of society. Even within the knowledge management field, which encompasses a wide array of collaborated disciplines, a growing number of scholars are directing their attention towards the study of health ecosystems (Laihonen, 2012; Secundo et al., 2018), the digitalization of healthcare (Atanasova et al., 2017; Hussey et al., 2019; Lin & Kishove, 2021), innovations in the health management (Bullinger et al., 2012; Allarkhia, 2018; Liu et al., 2022), and other managerial topics. However, despite the interest in the health-related topics, the domain of knowledge management within the healthcare sector remains underresearched, especially in the context of emerging collaborative models and methodologies. Moreover, the research on the implementation of knowledge transfer processes in open health communities is currently lacking. Knowledge transfer in health communities presents a complex challenge due to its diverse and often unstructured nature. The exchange of information and knowledge within these communities is vital for innovation, collaboration, and ultimately, improving health outcomes. However, ensuring the reliability and safety of transferred knowledge is a major challenge that requires a deep understanding of its settings and processes. Research problem stands on the following question: how knowledge transfer can be enabled and organized to achieve community-driven innovation?

In order to answer this question, the general research aim was raised to explain how knowledge transfer should be organized and enabled in open health communities to achieve community-driven innovation. Research aim is distributed among the following research questions; thus, in this section of the dissertation, the research findings will be discussed through the following research questions.

First question of the research asks how knowledge managementis organized in open health communities, given the diversity of information sources?

The need of explaining knowledge management, especially selected knowledge transfer process in open health communities was developed. Involving patients into the process of knowledge transfer and co-creation holds the potential to foster innovation (Amann & Rubinelli, 2017; Secundo et al., 2019). Engaging patients in the process primarily commences with their active participation. There exist numerous opportunities for patients to engage, ranging from making decisions about their own health, self-education, and pursuing personal health goals to participating in larger groups. These groups include geographical communities, often managed from a top-down approach, and official associations that specifically cater to patients with particular diseases. Additionally, there are these health communities initiated by the individuals but easily accessible to anyone who is interested, playing a significant role

for those seeking support and information. A detailed analysis of the existing scholarly research (Greenhalgh et al., 2011; Bullinger et al., 2012; Robert et al., 2015; Amann & Rubinelli, 2017; Bergerum et al., 2019) reveals that the exploration of health communities remains fragmented with only isolated aspects of this multifaceted phenomenon. Consequently, the sources of information used by the communities remain inadequately investigated, fragmented, and lacking deliberate organization. Amann and Rubinelli (2017) state that online health communities stand as information source itself within peer-to-peer support activities, but without explanation about information sources to health communities generally. Jull, Giles, and Graham (2017) refer to various knowledge users (patients, family members, healthcare providers) and the creation of partnerships and engagement, but misses information sources as knowledge senders. Sources of information are often considered the main determinants of relationships between the members in management science research, as Cori et al. (2019) wrote: "… a never experienced exchange of information among stakeholders and a profound modification in roles and relationships among social actors". Still, in this research, the information sources of open health communities are the primary source of information that the community member relies on when creating their own knowledge and making health decisions. The dissertation establishes that the respondents stated a diversity of sources of information: the health community itself and its connections (the community leader, other members, participating medical personnel, and external business and scientific entities), various literature (books, films, magazines, or scientific literature), sources on the Internet (search engines, social networks, mobile apps, forums), relatives (partners, spouses, parents, siblings, friends), and medical personnel (doctors, nurses, midwives, and others). Research participants tend to trust the knowledge disseminated by the medical staff mostly. However, the respondents complain about the availability of trusted informational sources; thus, they are looking for alternative sources and ways to answer the arising questions. Therefore, knowledge management struggles in open health communities as the most trusted information source seems almost unavailable to reach for the additional activities. When looking for additional sources, more challenges raise: inconsistency of knowledge between different information sources, distrust or overconfidence in one's existing knowledge, etc. Those were expressed as some of the barriers to obtaining correct health information. The barriers of this type are expressed in the management literature as well (Blanchet, 2012; Laihonen, 2012; Kitson et al., 2013; Menear et al., 2019), as significant factors in knowledge asymmetries and difficulties in knowledge management organization due to the diversity of information sources.

Next question is how the application of knowledge management theory can improve knowledge management and particularly transfer processes within the open health communities? The main principle of the KM theory selected for the thesis was knowledge transfer: the concept of transferring knowledge from one individual or group to another, particularly to address the specific challenges or support the decision-making processes, which is a fundamental aspect of knowledge management theory. KM theory delves deeply into the mechanisms, processes, and importance of

knowledge transfer within the organizations (Nonaka & Takeuchi, 1995; Grant, 1996; Davenport & Prusak, 1998; Argote, 1999). Thus, there exists a significant research gap that necessitates the investigation and scholarly attention within the management sciences for particular knowledge transfer processes within the open health communities. However, it is worth noting that there is a noticeable gap of extensive empirical investigations, specifically targeting health communities in a direct, face-to-face, or mixed community context. To the author's knowledge, a study that would cover both direct and online health communities in the contexts of knowledge transfer has not been conducted before this thesis. Secundo et al. (2018) worked on the examination of knowledge transfer in facilitating open innovation within the healthcare ecosystems, but still, not in the open health communities. Consequently, this thesis marks as the first qualitative study to encompass both types of health communities, i.e., direct and online, all while situated within the framework of knowledge management.

Following the empirical exploration of open health communities within the field of knowledge management, four most important influencing factors have been provided, each of which plays a pivotal role in shaping the knowledge transfer dynamics and the innovative outcomes within these communities: information sources, knowledge management activities, facilitators of knowledge management, and knowledge transfer influence on innovativeness. Thus, in order to answer the second research question, open health communities were studied as well based on the SECI model by Nonaka and Takeuchi (1995). The SECI model of knowledge dimensions provides insights into how tacit and explicit knowledge is transformed into organizational knowledge. The four main activities of knowledge creation where knowledge transfer lies in the processes within transferring tacit knowledge into explicit, or transferring via one individual to another, or even from one entity to anotherwere investigated in relation to identified actions in health communities. Thus, these activities encompass various processes through knowledge creation, sharing, and transfer. Within the direct, face-to-face communities, the respondents shared that they engage in all phases of the SECI model. In contrast, online communities show a different knowledge creation pattern. The primary emphasis within these virtual communities often lies in the initial phases of the SECI model, particularly in socialization. Online communities tend to show limitations in advancing through the externalization, combination, and internalization phases. In cases where gaps or disruptions occur in this process, the resultant knowledge creation may fall down. Consequently, these disparities in adherence to the SECI model's phases between direct and online health communities underscore the complex interplay between knowledge transfer processes and innovation outcomes in the diverse landscape of health community types.

The previously discussed factors contribute to the knowledge transfer process within these communities, and they are as well aligned with the innovation outcomes. However, concerning the creation of innovations within the open health communities, the responses of community members were found to fall into three overarching categories: co-creation, engagement, and orchestration. These concepts always

depend on the context, environment, and culture surroundings and lay a ground for the success of knowledge transfer processes. Co-creation is a collaborative process, often involving both community members and external parties. Respondents as well acknowledged the importance of fostering a reliable environment and the expertise of members in the innovation creation process. Engagement part shows the level of involvement of community members in the creation of innovations. It was noted that the community members can play a crucial role not only as consumers of innovations but as active participants in their development as well. Moreover, the orchestration of open health community encompasses the mechanisms and practices put in place to facilitate and manage the innovation creation process. The participants discussed the fundamentals of orchestrating open health communities to achieve more successful innovation outcomes.

The application of knowledge management theory can improve knowledge management and particularly transfer processes within the open health communities that are tied with knowledge creation or transfer activities as well as additional settings, which are very important components of the application success.

Next, the thesis is investigating what are the critical enablers for knowledge management in the open health communities. The scholars provide insights into various aspects of knowledge management, including the critical enablers for effective implementation and success of knowledge transfer (Wiig, 1997; Alavi & Leidner, 2001; Gold, Malhotra, & Segars, 2001; Lin, 2007). However, they do not specifically focus on healthcare, even the principles and strategies can often be applied in the healthcare settings with appropriate adaptation. Thus, the author looked into the specific needs of open health community members related to the facilitators with a focus on enhancing their impact on knowledge transfer processes. The facilitators in knowledge transfer can play dual roles as enablers and barriers, depending on how they are involved. When used effectively, these facilitators are critical enablers, aiding in the smooth transfer of knowledge. The identified facilitators were categorized into main groups based on the collective responses of the participants: accessibility, trust, and openness. Accessibility emerged as one of the facilitators in the knowledge transfer process. It was recognized that easy access to information, resources, and communication channels greatly aids the transfer of knowledge within the health communities. However, the study as well highlighted that accessibility can be potentially serving as a barrier when not appropriately managed or when information overload occurs. Addressing the needs of community members, such as ensuring immediate access to information, was acknowledged as crucial for optimizing this facilitator's role. Trust was identified as a factor fostering a conducive environment for knowledge exchange and transfer. When community members trust each other and the information being shared, the knowledge transfer process is streamlined. Conversely, a lack of trust can slow down the process of knowledge sharing between the community actors. The needs of community members to build and maintain trust were noted, emphasizing the importance of effective leadership and structured, reliable information. Openness within the health communities was recognized as a critical enabler that encourages transparency, collaboration, and knowledge sharing.

An open community promotes a wider pool of ideas and experiences, which are integral to the successful knowledge transfer and innovation outcomes.

Additionally, the main needs of the respondents of an open health community were indicated: effective leadership, structured and reliable information, participation of healthcare professionals, immediate access to information, and concrete and known action plans, and active involvement of participants in them. Interestingly, the study shows that fulfilling the needs of community members regarding critical enabler for KM has the potential to lead to more significant and impactful innovation outcomes and enhance the sustainability of open health communities. These highlights are the critical enablers for knowledge management in the open health communities.

In summary, the study sheds light on the critical factors that are necessary for organizing and enabling knowledge transfer within the open health communities to foster community-driven innovation. After identifying and understanding the critical enablers inherent in the knowledge transfer process, the groundwork was laid for implementing effective strategies and practices. Moving forward, it is imperative for open health communities to prioritize the cultivation of these facilitators while addressing potential barriers. These results of the research hold the potential to strategies and practices aimed at enhancing the innovativeness of open health communities, ultimately contributing to more effective solutions for the healthcare challenges. Adhering to these principles and leveraging the insights gained from this research, open health communities can create an environment conducive to community-driven innovation. The community members can harness collective expertise, identify innovative solutions to healthcare challenges, and ultimately improve patient outcomes through effective knowledge transfer processes. As the advancement in the realm of open health communities continues, the implementation of these strategies will be instrumental in driving forward progress and innovation in the healthcare delivery.

4.1. Contribution to Theory

This thesis makes a substantial contribution to the theoretical foundations of knowledge transfer within the open health communities, offering novel insights. This research contributes to theory by providing a refined conceptualization of open health communities. It clarifies the unique attributes, dynamics, and functions of these communities within the healthcare landscape, paving the way for a more comprehensive understanding of their role in knowledge transfer and innovation.

The thesis delves deeply into the knowledge transfer processes and activities within the open health communities. It elucidates the intricacies of SECI model activities (Nonaka & Takeuchi, 1995): socialization, externalization, combination, and internalization, shedding light on how these processes manifest and interact within the context of health-related knowledge transfer.

A significant theoretical contribution lies in the identification and analysis of facilitators that enhance knowledge transfer within the open health communities. This research explores the pivotal roles of health professionals, trust-building mechanisms,

information sharing practices, and decision-making processes in facilitating effective knowledge transfer.

The thesis enriches the theoretical landscape by investigating the impact of knowledge transfer on open innovation within the health communities. It offers insights into how the exchange of knowledge influences the generation of innovative solutions to health challenges, contributing to the discourse on the nexus between the knowledge transfer and innovation.

Another notable contribution lies in recognizing and analysing sector-specific variations in knowledge transfer within the open health communities. This research underscores that different types of open health communities exhibit different approaches to defining and implementing knowledge transfer strategies, expanding the theoretical understanding of context-dependent knowledge dynamics.

The theoretical framework developed in this thesis highlights the principles of integrating diversified knowledge to address the health challenges. It introduces a nuanced perspective on how diverse knowledge sources can be harmonized to foster innovation, thus enriching the discourse on knowledge integration.

The theoretical contribution extends to identifying barriers to the dissemination and integration of knowledge for innovation generation. After examining these barriers, the thesis offers insights into the challenges that must be addressed to optimize knowledge transfer in the open health communities.

This thesis significantly advances the theoretical underpinnings of knowledge transfer in open health communities by refining the conceptualization of these communities, elucidating knowledge transfer processes, identifying facilitators, exploring the influence on innovation, and proposing a model for knowledge creation and transfer opportunities. This multifaceted theoretical contribution enhances the understanding of the complex interplay between knowledge transfer and innovation within the healthcare domain.

4.2. Managerial Implications

In addition to its theoretical contributions, this study holds significant implications for managers within the context of open health communities. The findings from the qualitative study underscore the importance of active and regular leadership engagement in fostering innovation within these communities. The study reveals that leaders who invest substantial effort in co-creating with the community members tend to yield better innovation outcomes.

Furthermore, the study highlights the crucial role of trust-building and relationship cultivation within the open health communities. Communities that prioritize and invest in the establishment of trust and strong relationships are more likely to exhibit higher levels of innovativeness compared to their counterparts. Moreover, these communities are more likely to generate a greater number of ideas at the initial stages of the innovation funnel. This implies that by investing in trust and relationships, open health communities enhance their capacity to generate and nurture innovative concepts, which ultimately contributes to the advancement of public health.

In addition to the aforementioned findings, the study highlights the importance of openness in open health communities with regards to the external stakeholders, such as other communities, firms, or scientific institutions. Collaboration with external entities brings responsibility and engagement criteria, thereby motivating community members to actively embrace ideas and translate them into tangible outcomes. Notably, commitment to collaborating with external stakeholders, participating in diverse projects, conducting regular purposeful meetings, and achieving significant milestones play a pivotal role in transforming tacit knowledge into the explicit knowledge. It is crucial for the managers aspiring to attain superior results and cultivate long-term perspectives to prioritize purposeful collaborations. If actively seeking and fostering meaningful partnerships with external stakeholders, managers can harness the collective intelligence, expertise, and resources available within the broader ecosystem. This strategic emphasis on the collaboration not only accelerates the transformation of knowledge but as well enhances the potential for generating novel insights, innovative solutions, and enduring outcomes.

After establishing and nurturing purposeful collaborations, managers within the open health communities can foster an environment that promotes knowledge exchange, co-creation, and collective problem-solving. This in turn supports the attainment of better results, long-term sustainability, and ongoing progress. Therefore, the managers who aspire to drive success and ensure a prosperous future for open health communities should allocate significant attention and resources towards cultivating purposeful collaborations with the external stakeholders.

Achieving a balance between community goals, decision-making processes, ethical considerations, and compliance with data protection regulations poses a significant challenge for managers within the open health communities. The health industry, being one of the most sensitive sectors, places a strong emphasis on the information sharing and data protection. The nature of tacit knowledge, which remains unshared for valid reasons, further complicates the situation. Some information may be too sensitive or personal for individuals to willingly disclose, leading to trust issues among the community members. Conversely, when information is shared anonymously, it may create a perception of mistrust among the participants. Successful management of these intricacies requires a careful combination of various factors. Managers must navigate the fine line between respecting individual privacy and fostering an environment conducive to innovation. Every asset within the community must be acknowledged and given attention to create a safe and secure space for sharing. It is within this safe space that individuals feel comfortable sharing sensitive information and pursuing higher goals, leading to better outcomes. This secure environment encourages the enrichment of knowledge regarding diseases and the exploration of new healing patterns. Managers must prioritize the establishment of trust and confidentiality within the community. Implementing robust ethical guidelines and adhering to data protection regulations, they can foster an atmosphere of trust and create mechanisms that safeguard sensitive information. Open and transparent communication about privacy practices and data handling is crucial for building trust and assuring community members that their information is protected.

Ultimately, managers in open health communities should adopt a holistic approach, considering the delicate balance between community goals, decision-making processes, ethical concerns, and compliance with the data protection regulations. Open health communities can unlock the full potential of knowledge exchange, innovation, and disease management by striking this balance and creating a safe space for sharing, leading to improved outcomes and advancements in healthcare practices.

4.3. Policy Implications

The findings of this dissertation have significant implications for policy makers, as they underscore the value of adopting a systematic thinking approach to enhance the understanding and foster open innovation.

After identifying and addressing the potential barriers or gaps, the policy makers can create an enabling environment that nurtures and accelerates open innovation activities. If adopting a holistic perspective, policy makers can develop informed policies, address barriers, and seize opportunities to create an enabling environment for open health communities to create innovation. This approach enables policy makers to actively contribute to the growth and success of open innovation ecosystems, leading to enhanced economic, social, and technological advancements. Policy makers can leverage this understanding to develop and implement effective policies that support open innovation initiatives.

On the basis of the interviews, some interviewees expressed that initial innovative ideas die at the early stage or even are not communicated at all because of the feeling that “nobody cares”. Communities do not have the right place to share or develop their ideas officially, there is no clear mechanism to propose problem-solving ideas for policy makers. Governments shall clearly try to influence better conditions for health communities oriented towards open innovation from the beginning stage. Open health communities can be motivated to implement open innovation by establishing mechanisms or even funding.

Based on the interviews that were conducted, it has been found that certain interviewees indicated that promising novel ideas often perish in their early stages or remain unvoiced due to a prevailing sense of indifference. Communities lack suitable platforms to officially share and foster their ideas, and there is a lack of well-defined mechanisms for presenting problem-solving ideas to policymakers. Governments should actively strive to create more favourable conditions for health communities to engage in open innovation right from the outset. Encouraging open health communities to embrace open innovation can be achieved through the establishment of appropriate mechanisms and potentially providing financial support.

The governments that are actively motivating and enabling open innovation practices can catalyse the potential of open health communities to contribute to problem-solving and policy development in the healthcare domain. Providing the necessary mechanisms and resources, policy makers can empower community members, stimulate creativity, and enhance the overall effectiveness of open innovation initiatives within the health sector.

4.4. Limitations and Prospects for Future Research

"I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me" (Isaac Newton)

This section of the doctoral dissertation shows the nature of constructivism, which is the ocean of different perspectives, settings, actions, contexts, etc. that still lays undiscovered. The personal goal of the dissertation is to find "a prettier shell than ordinary", i.e., to find and explore (with in-depth understanding) unexplored and selected narrow management assets of the exact phenomena, the open health communities with a context of women's life-long health perspective.

The sample lacks all components of a comprehensive health ecosystem. The findings are limited to the specific aspects of knowledge management within the intermediate level of organizational structure, rather than encompassing all levels. The dissertation only delved into the specific nature of certain phenomena. It is important to note that an open health community is a form of independent organization or association and lacks any legal status or formal obligations. These communities are originally established by other organizations or individuals (such as patients or professionals), but can still be considered organizations based on the fundamental principles of organizational behaviour theory. One of the main challenges throughout the dissertation was defining and presenting a clear understanding of what exactly constitutes an open health community.

In addition, the study examined two distinct categories of open health communities, i.e., direct and online. When analysing the findings, a novel type of mixed open health community, which had not been previously documented in the existing literature, was identified. The mixed health community incorporates and uses both direct and online forms of interaction, operating either in person or remotely. It involves a wider range of participants and operates at both local and international levels. Exploring this emerging domain, along with considering the implications of health digitalization, holds great potential for future research.

The research focused on the critical aspect of women's lifelong health, which is considered the foundational basis for public health as a whole. Women's health is integral to the well-being of future generations, as it directly influences the health of children at various stages, including newborn, children, and adolescent health. Therefore, understanding women's health plays a central role in comprehending the overall health dynamics. It is important to note that the research has its scope, as it did not include men, thereby restricting the diversity of perspectives that were examined.

In addition, it is important to note that this research adopts a qualitative approach. Specifically, it takes the form of a case study where the researcher's bias inevitably intertwines with thoughts and interpretations, as they are inseparable from

the human experience. Nevertheless, the chosen methodological approach aimed to minimize this bias to the greatest extent possible. Furthermore, the analysis of open health communities involves a creative interpretation of the observed phenomena. This interpretation is shaped by the researcher's understanding, knowledge, and perspectives, contributing to a nuanced exploration of the subject matter.

A comprehensive and in-depth investigation of the subject matter is essential to gain a nuanced understanding of open health community assets. Future research endeavours can contribute to the existing body of knowledge by focusing on specific knowledge management assets within these communities. For instance, exploring the unique characteristics and implications of the newly identified mixed type of community would enrich the understanding of their dynamics and potential benefits.

In addition, conducting longitudinal research would provide valuable insights into the evolution and long-term outcomes of the open health communities. This longitudinal approach would allow researchers to capture the dynamic nature of these communities over time, observe any changes in knowledge management assets, and uncover potential challenges or successes that may emerge as the community evolves.

Overall, by delving into specific knowledge management assets, exploring mixed type communities, conducting longitudinal studies, and investigating more fostering settings for innovativeness, future research can significantly advance the understanding of open health communities and their potential for promoting improved health outcomes.

In order to further enhance the applicability of the proposed conceptual framework, it is recommended to conduct tests in broader settings, specific contexts, or industries. If expanding the scope of the investigation, the researchers can deepen their understanding of the framework's utility and effectiveness in diverse scenarios. This expansion of testing parameters would contribute to the knowledge base by identifying and analysing the variations and similarities that exist across different settings. If analysing these specific contexts, the researchers can identify sector-specific patterns, trends, or best practices that may enhance the framework's relevance and effectiveness.

CONCLUSIONS

1. The role of the open health community was conceptualized. **Open health community (OHC)** refers to the collaborative and inclusive network of individuals, organizations, and stakeholders within the health domain, fostering a dynamic exchange of ideas, knowledge, and expertise. The concept of a health community is defined as a source of existing health knowledge aimed at supporting community members. Open health community is a community that is **purposefully created for the specific health issues and uses internal and external knowledge to co-create community-driven innovation** in addressing health issues through the sharing of the existing knowledge and the potential for co-creation and transfer of new knowledge seeking to enhance healthcare.

1.1. During the theoretical exploration and systematic literature review, open health communities were categorized into two main types, i.e., direct and online. During the empirical study, the third type of open health communities were proposed, i.e., a hybrid type. Hybrid type of open health community is a mix of the most important settings of direct and online communities.

1.2. **Health community openness** highlights the degree of accessibility and receptiveness within the open health community, allowing for free flow of information and ideas.

1.3. **Orchestration of open health community** involves the deliberate and coordinated efforts to facilitate effective interactions and synergies among the community members, maximizing the potential for knowledge exchange and innovation.

2. A conceptual relationship between the open health communities, their openness, knowledge transfer, and knowledge outputs for community-driven innovation were grounded and are important to the understanding of the dynamics within these communities:

2.1. **Openness** within the health communities fosters a diverse and inclusive environment where different perspectives and ideas can thrive. This diversity often leads to the generation of innovative solutions that may not have arisen in a closed setting.

2.2. **Knowledge transfer** is the main ground of community-driven innovation. The expressed ability to share knowledge from various informational sources, both within and outside the community, fuels the creative and problem-solving processes. Moreover, the active participation of community members in the processes of knowledge transfer and collaborative activities enhances their sense of ownership and responsibility for the innovation outcomes. This engagement is a driving force behind the successful innovations.

2.3. **Orchestration of the community and capability to manage the innovation process**, as well as its openness, plays a crucial role in translating knowledge into practical innovations. Effective leadership,

structured information, and the involvement of the healthcare professionals are some of the key elements.

3. The original qualitative research methodology was developed for scientific explanation on how knowledge transfer should be organized and enabled in open health communities in order to achieve community-driven innovation. After careful consideration of various qualitative research methods, a structured framework emerged to guide data collection and analysis. This framework not only enabled the exploration of diverse perspectives and experiences but as well facilitated the identification of key themes and patterns underlying knowledge transfer processes.

The development of qualitative research methodology signifies a significant step towards unravelling the complexities of knowledge transfer in the open health communities. Providing a structured approach to inquiry, this methodology empowers researchers to uncover insights that can inform strategies for enhancing co-creation, innovation, and ultimately, improving health outcomes.

4. Knowledge transfer peculiarities in open health communities were empirically defined, and the critical enabling factors for successful knowledge circulation and co-creation were revealed. The relationships between open health communities, knowledge transfer, and their influence on community-driven innovation is integral to comprehending the dynamics within these unique systems. Within this context, four key elements come into focus: information sources, knowledge management activities, facilitators of knowledge management, and knowledge transfer's influence on innovativeness:

4.1. Members of open health communities use a wide range of diverse **information sources**. The main informational sources of open health communities were explored: the health community itself and its connections (the community leader, other members, participating medical personnel, and external business and scientific entities: these communities serve as rich repositories of experiential knowledge), various literature (books, films, magazines, pamphlets, or scientific literature), sources on the Internet (search engines, social networks, mobile applications, various chat windows, and followed celebrities), relatives (partners, spouses, parents, siblings, friends), and medical personnel (doctors, nurses, midwives, and others). The most important source of information remains the medical staff.

4.2. **Knowledge transfer activities** encompass the processes of collecting, organizing, disseminating, and applying knowledge within the open health communities. Within the direct, face-to-face communities, all phases of the SECI model were observed. The members engage in socialization, where tacit knowledge is shared through interpersonal interactions. Externalization processes enable the conversion of this tacit knowledge into explicit forms, often through discussions and collaborative activities. Combination activities follow, where diverse knowledge elements are synthesized to form novel insights and concepts.

Internalization ensures that this newly created knowledge becomes an integral part of the community's collective knowledge. In contrast, online communities show a different knowledge creation pattern. The primary emphasis within these virtual communities often lies in the initial phases of the SECI model, particularly in socialization. The members of online communities frequently engage in discussions, information sharing, and social interaction, facilitating the exchange of tacit knowledge. A significant distinction arises when proceeding beyond socialization. Most online communities tend to show limitations in advancing through the externalization, combination, and internalization phases. While some online communities may go through all phases successfully, the majority remains primarily rooted in the socialization with limited progression towards explicit knowledge creation and integration.

4.3. **The facilitators of knowledge transfer in the open health communities are explored through several factors: (1) accessibility, (2) trust, and (3) openness.** Accessibility was recognized as easy access to information, resources, and communication channels. Addressing the needs of community members, such as ensuring immediate access to information, was acknowledged as crucial for optimizing this facilitator's role. Trust was identified as a factor fostering a conducive environment for knowledge exchange and transfer. When community members trust each other and the information being shared, the knowledge transfer process is streamlined. Openness within the health communities was recognized as a facilitator that encourages transparency, collaboration, and knowledge sharing. An open community promotes a wider pool of ideas and experiences, which are integral to knowledge transfer and innovation outcomes. Meeting the needs of community members, including their active involvement in decision-making, emerged as a vital factor in optimizing this facilitator.

4.4. **The main needs** of the respondents from an open health community were indicated: effective leadership, structured and reliable information, participation of healthcare professionals, immediate access to information, and concrete and known action plans and active involvement of participants in them. The study shows that fulfilling the needs of community members regarding the facilitators has the potential to not only lead to more significant and impactful innovation outcomes but enhance the sustainability of open health communities as well. This shows the relationship between effective facilitation of knowledge transfer and success of health communities in fostering innovation.

4.5. **Knowledge transfer influence on the innovativeness of open health communities**: the more effectively knowledge is transferred among the members and beyond community boundaries, the more it fosters innovation. Co-creation emerged as a significant aspect of innovation within the open health communities. Online communities usually did not

use co-creation as a tool. Engagement part showed the level of involvement of community members in the creation of innovations. The respondents noted that it is crucial to start involve the community members not only as consumers of innovations but as active participants in the development process as well. The orchestration of open health community encompasses the mechanisms to achieve more successful innovation outcomes. The participants of the study emphasized the significance of creating a reliable environment and inclusion of the medical professionals to the innovation creation process. Moreover, they expressed the view that community members should be encouraged to take on active roles. This shift in perspective could potentially lead to more impactful innovations emerging from the open health communities.

5. Empirically grounded model to facilitate knowledge transfer process within the open health communities was created. Based on the insights and findings, the model was created through qualitative research process and includes the main findings: informational sources of open health community, open health community orchestration, knowledge transfer activities in communities, main facilitators of knowledge transfer. This model shows the influence on the community-driven innovation.

5. SANTRAUKA

Sveikatos bendruomenės – tai ne asociacijos ir ne geografinės bendruomenės; jos gali būti ir priklausomos, ir nepriklausomos nuo organizacijos, dažniausiai neturi aiškios struktūros. Sveikatos bendruomenės – tai dėl konkretaus su sveikata susijusio klausimo žmonių grupė, nesusijusi jokiais darbo santykiais, dalyvaujanti veikloje, besidalijanti ir kurianti žinias geresnės sveikatos sprendimams pasiekti.

Pagal nustatytus atvirųjų inovacijų parametrus, atvirosios sveikatos bendruomenės – tai tokios bendruomenės, kurios yra atviros: narių priėmimui (sąlyginai tematiškai) ir / ar žinių judėjimui iš išorės į vidų, iš vidaus į išorę. „Išorė“ – tai verslo, mokslo, kiti subjektai, kurie bendradarbiauja kuriant bendras žinias ir siekiant tikslų. Suderintos žinios panaudojamos ir perduodamos tolimesniam žinių gyvavimo ciklui bei laikomos bendrakūros rezultatu.

Mokslinis tyrimas remiasi žinių valdymo teorija – tai mokslinė teorija, skirta efektyviai valdyti turimas žinias, siekiant pasiekti įvairius tikslus. Ši teorija siekia suprasti, kaip organizacijos gali kurti, kaupti, saugoti, dalintis ir panaudoti žinias savo veiklai gerinti. Žinių valdymo teorija siekia sukurti teorines koncepcijas, strategijas ir įrankius žinių valdymo procesams optimizuoti ir yra pritaikoma įvairiose disciplinose. Nagrinėjamai temai tyrime pasirinktas pagrindinis konkretus žinių valdymo teorijos principas – žinių perdavimas. Jis apima žinių perdavimą iš vieno asmens ar grupės į kitą, dažnai siekiant spręsti konkrečias problemas arba paremti sprendimų priėmimo procesus. Žinių valdymo teorija teikia įrankius ir strategijas, kuriomis organizacijos gali efektyviai tvarkyti savo žinių turtą, skatinti bendradarbiavimą ir inovacijas bei siekti konkurencinio pranašumo.

Mokslinė problema. Visuomenės integravimas į sveikatos priežiūrą laikomas esminiu veiksniu skatinant sveikatos naujoves dėl kelių priežasčių. Pirma, visuomenė daro didelę įtaką sveikatos priežiūros sistemai ir yra tiesiogiai veikiama jos rezultatų (Marmot ir kt., 2012; Kraushaar ir kt., 2012). Todėl visuomenės įtraukimas į sveikatos sistemos tobulinimo procesą gali užtikrinti, kad kuriami sveikatos priežiūros sprendimai būtų efektyvesni (Frieden, 2010; Wallerstein ir Duran, 2010). Tai paradigmos pokytis nuo tradicinės prielaidos, kad tik sveikatos priežiūros specialistai gali kurti ir skleisti naujas sveikatos priežiūros koncepcijas ir sprendimus. Pacientai pirmieji turi įvairių patirtinių žinių apie gyvenimą esant įvairioms sveikatos sąlygoms, o jų indėlis gali padėti sveikatos priežiūros specialistams geriau suprasti pacientų iššūkius (Castro ir kt., 2019; Jones, Jallinoja ir Pietilä, 2021; Beresford, 2019). Pacientai taip pat gali pasiūlyti vertingų įžvalgų apie realią sveikatos priežiūros patirtį, o jų perspektyvos gali padėti sveikatos priežiūros specialistams kurti išsamesnius sveikatos priežiūros sprendimus. Visuomenė gali padėti nustatyti nepatenkintus sveikatos priežiūros paslaugų poreikius ir spragas (Ahgren ir Axelsson, 2007). Todėl visuomenės integravimas į sveikatos priežiūros plėtrą yra laikomas kritiniu veiksniu, skatinančiu inovacijų pažangą sveikatos priežiūros pramonės srityje (Ramsay, Fulop ir Edwards, 2009; Bullinger ir kt., 2012; Sangiorgi ir kt., 2017; Patrício ir kt., 2020).

Socialinės ir ekonominės aplinkybės taip pat turi didelę įtaką sveikatai – sveikatos priežiūros prieinamumas, sveika elgsena, aplinkos veiksniai, psichologinis

stresas, išsilavinimas ir sveikatos raštingumas – gali prisidėti prie sveikatos rezultatų (Marmot, 2005; Phelan, Link ir Tehranifar, 2010; McCartney, Collins ir Mackenzie, 2013; Jindrová ir Labudová, 2020). Daugėja įrodymų apie santykių, bendruomenės, paramos ir socialinių inovacijų svarbą sveikatos kokybei. Socialiniai ryšiai veikia kaip paramos sistema ir turi teigiamą sąveiką palaikant gerą psichinę sveikatą. Tai taip pat gali turėti įtakos elgsenai sveikatai ir gyvenimo būdo pasirinkimui, gali paskatinti kurti ir įgyvendinti veiksmingas sveikatos programas ir intervencijas, kurios sprendžia konkrečias sveikatos problemas bendruomenėje. (Rifkin, 2014; George ir kt., 2015; Hoon-Chuah ir kt., 2018; Haldane ir kt., 2019; Sandvin-Olsson ir kt., 2020; Thompson ir Burke, 2020; Russell, 2021).

Apskritai visuomenės integravimas į sveikatos priežiūrą gali padėti rasti veiksmingesnius, efektyvesnius ir etiškesnius sveikatos priežiūros sprendimus, atitinkančius įvairių gyventojų poreikius. Bendruomenės dalyvavimas yra būtinas valdant sveikatą (Marston, Renedo ir Miles, 2020). Taigi bendruomenės įsitraukimas ir įvairių žinių šaltinių integravimas į sveikatos inovacijų ir bendros kūrimo procesus tampa itin svarbus būsimai sveikatos sistemų sėkmei visame pasaulyje (Petraitė ir kt., 2018). Disertacijos tema nagrinėja efektyvių žinių perdavimo modelių poreikį atvirose sveikatos bendruomenėse, kuriant ir įgyvendinant inovatyvius sveikatos problemų sprendimus; nagrinėja pasitikėjimo, motyvacijos ir socialinių tinklų vaidmenį žinių perdavimo procese, kurie yra esminiai sėkmingų inovacijų veiksniai; tiria bendro kūrybos procesų naudojimą inovacijų srityje, o tai yra naujas ir daug žadantis būdas įtraukti į inovacijų procesą įvairias suinteresuotąsias šalis; prisideda prie literatūros apie žinių valdymą ir inovacijas sveikatos priežiūros srityje, kuri yra auganti ir svarbi tyrimų sritis.

Atitinkant besivystančią, bet dar nepakankamą mokslinę literatūrą, orientuotą į žinių perdavimo ir inovatyvumo lygio sveikatos priežiūros bendruomenėse ryšį, daktaro disertacija sukurta remiantis atvirų inovacijų ekosistemų tyrimo metodika, siekiant atskleisti gerovės visuomenės iššūkius, tokius kaip sveikatos kokybė, paslaugos, socialinė nelygybė, senėjanti visuomenė ir kt. Siekiama geresnio supratimo apie tai, kaip veikia atviros inovacijos ir žinių valdymas sveikatos priežiūros sistemoje, koks žinių valdymo ciklas yra svarbus norint atkreipti dėmesį į geresnius rezultatus, kaip žinių perdavimo modeliai gali duoti veiksmingesnių sveikatos rezultatų.

Esamos literatūros trūkumai. Žinių valdymo teorijos požiūriu, mes žinome, kad standartiniai žinių valdymo procesai apima daugybę ir per daug pririšančių veiklų, tokių kaip žinių paieška, atpažinimas, perdavimas, dalijimasis, įsisavinimas ir žinių kūrimas. Žinių vadybos tyrimai sveikatos sektoriuje buvo sparčiai besivystanti sritis, tačiau apsiribojama tik žinių valdymo standartais ir menkai sprendžiama naujų žinių kūrimo, ypač atvirų inovacijų ir bendro kūrimo problemų, kuriose suinteresuotosios šalys atlieka svarbų vaidmenį.

Vadybos mokslai dažnai siekia giliau suprasti sveikatos ekosistemą (Laihonen, 2012), tačiau lygiagrečiai didėja žinių procesų svarba sveikatos bendruomenėse sveikatos valdymo, žinių kūrimo ir bendruomenės skatinamų inovacijų srityse. Vis dėlto žinių asimetrija tarp profesionalų, pacientų ir vietos bendruomenių išlieka

didelė. Medicinos specialistai dažnai turi ribotą supratimą apie pacientus ir jų poreikius ir prastai reprezentuoja tikrąjį mažesnių sveikatos bendruomenių požiūrį (Bullinger ir kt., 2012), nes jų žinios lieka tylios.

Apskritai sveikatos priežiūros sektorius vystosi į žiniomis pagrįstą bendruomenę su įvairiomis suinteresuotosiomis šalimis: pacientais, jų artimaisiais, slaugytojais, ligoninėmis, farmacijos įmonėmis, žiniasklaida ir kt. (Bose, 2003; Khan, 2014), kurie dalijasi daugybe informacijos apie sveikatos problemų, o tai turi įtakos sveikatos priežiūros kokybei.

Mokslinė problema grindžiama sveikatos ekosistemos ribų išplėtimu ir perkėlimu iš atskirų institucijų į tolimų, bet tarpusavyje priklausomų ir suinteresuotųjų šalių tinklą. Tokio tinklo, kaip naujoves kuriančios ekosistemos, valdymas iš esmės grindžiamas savireguliacijos principais, kur pagrindinis procesas yra daugiadisciplinis pasitikėjimu pagrįstas mokymasis ir naujų žinių generavimas, sprendžiant problemas realiuoju laiku, bei gėrio sklaida.

Praktika, siekiant padidinti poveikį. Šio tipo tyrimai integruoja tinklų kūrimą, atvirą ir atsakingą inovacijų valdymą, suaugusiųjų mokymąsi ir bendradarbiavimo tyrimus, kurie yra kontekstualizuojami institucinėje, socialinėje ir strateginėje sveikatos priežiūros aplinkoje. Dėl to šiuo metu vykstantis tyrimas sprendžia sveikatos ekosistemos transformacijos problemą ir ieško naujų požiūrių į socialinių sveikatos inovacijų įgalinimą, pagrįstą sveikatos bendruomenių įgalinimu integruoti žinias ir bendradarbiauti, remiantis šiuolaikinėmis mišraus mokymosi technologijomis. Atviros naujovių praktikos sveikatos priežiūros srityje lėmė įdomių inovacijų rezultatus ir yra gerai priimtos dalyvių (pacientų, slaugytojų, gydytojų, šeimos narių ir suinteresuotos visuomenės) (Bullinger ir kt., 2012). Atviros inovacijos klasikiniu būdu taikomos ir apibrėžiamos verslo modeliams „Atviros inovacijos apibūdinamos kaip paskirstytas inovacijų procesas, pagrįstas tikslingai valdomais žinių srautais per įmonės ribas“ (Chesbrough ir kt., 2014). Vis dėlto apie atvirą naujovių perspektyvą sveikatos priežiūros srityje pradedama daugiau diskutuoti įvairiose srityse, pavyzdžiui, sveikatos priežiūros srityje (Bullinger ir kt., 2012; Reinhardt ir kt., 2014; Gabriel ir kt., 2017; Silva ir kt., 2018).

Remiantis literatūros apžvalga ir nustatytomis tyrimų spragomis, žinių perdavimo atvirose sveikatos bendruomenėse mechanizmų, pavyzdžiui, pasitikėjimo, motyvacijos ir socialinių tinklų, temos naujovė yra poreikis tinkamai konceptualizuoti pagrindines šio tyrimo koncepcijas ir išsamesnį bei integruotą požiūrį į mechanizmus.

Tyrimų spragos, susijusios su žinių perdavimo ir bendruomenės sveikatos inovacijų poveikio empirine analize lauko tyrime. Tai apima poreikį įtraukti daugiadalykinius veiksnius ir jų sąveiką, pavyzdžiui, socialinių ir ekonominių aplinkybių svarbą, socialinę sąveiką ir pasitikėjimą palengvinant žinių perdavimą, motyvacijos vaidmenį, palaikant dalyvavimą ir įsitraukimą į atviras sveikatos bendruomenes.

Apibendrinant mokslinės problemos nagrinėjimo lygį galima teigti, kad nors atvirosios inovacijos sulaukė daug dėmesio, vis dar trūksta žinių, norint atsakyti į šiame tyrime keliamą tyrimo klausimą: kaip žinios perduodamos atvirose sveikatos bendruomenėse, atsižvelgiant į jų įvairovę, įgalinančius ir ribojančius veiksnius?

Tyrimo objektas – žinių perdavimo procesų įgyvendinimas atvirose sveikatos bendruomenėse.
Tyrimo tikslas – paaiškinti, kaip turėtų būti organizuojamas ir įgalintas žinių perdavimas atvirose sveikatos bendruomenėse, kad būtų įgyvendinamos bendruomenės kuriamos inovacijos.

Pagrindiniai tyrimui keliami klausimai:

RQ1: Kaip žinių valdymas organizuojamas atvirose sveikatos bendruomenėse, atsižvelgiant į informacijos šaltinių įvairovę?
RQ2: Kaip žinių valdymo teorijos taikymas gali pagerinti žinių valdymą ir ypač perdavimo procesus atvirose sveikatos bendruomenėse?
RQ3: Kokios yra svarbiausios žinių valdymo priemonės atvirose sveikatos bendruomenėse?

Siekiant šio tikslo, buvo nustatyti šie tyrimo tikslai:

1. Konceptualizuoti atvirų sveikatos bendruomenių vaidmenį žinių perdavimo procese;
2. Pagrįsti konceptualų ryšį tarp sveikatos bendruomenių ir žinių perdavimo procesų;
3. Parengti kokybinės žinių perdavimo procesų atvirose sveikatos bendruomenėse analizės metodiką;
4. Empiriškai apibrėžti žinių perdavimo procesų ypatumus atvirose sveikatos bendruomenėse, identifikuojant įgalinančius veiksnius, skatinančius žinių cirkuliaciją ir bendrakūrą;
5. Sukurti empiriškai pagrįstą modelį, kuris palengvintų žinių perdavimą atvirose sveikatos bendruomenėse.

Mokslinis naujumas ir teorinė reikšmė

Šis tyrimas išplečia žinių valdymo teoriją, pateikdamas naujas įžvalgas apie žinių perdavimo dinamiką atvirose sveikatos bendruomenėse. Tradicinės žinių valdymo teorijos dažniausiai nagrinėjamos organizacijose, ypač įtraukiant dideles korporacijas ar verslo sektorių. Sutelkiant dėmesį į sveikatos bendruomenes, šis tyrimas išplečia žinių valdymo teorijos taikymą į naują kontekstą. Tai parodo, kad žinių valdymo principai taikomi ne tik formaliose organizacinėse struktūrose, bet ir bendruomeninėse sveikatos iniciatyvose. Be to, apibendrinus įvairių sričių įžvalgas, jis praturtina supratimą apie tai, kaip žinios valdomos unikaliame atvirų sveikatos bendruomenių kontekste. Šis žinių valdymo teorijos išplėtimas parodo bendruomeniškumo svarbą žinių perdavimo procesuose.

Antra, atliekant kruopščią mokslinės literatūros analizę, šis tyrimas atskleidė esmines sveikatos bendruomenių, žinių perdavimo ir atvirų inovacijų sandūros

ypatybes ir konceptualius elementus. Apibendrinus turimas žinias šiose srityse, tyrimas sudaro pagrindą tolesniam tyrinėjimui.

Nors ankstesni mokslininkai daugiausia dėmesio skyrė makrolygmens sveikatos organizacijoms arba mikrolygmens individualiam elgesiui, šis tyrimas tiria naują kelią, atkreipdamas dėmesį į mezolygmenį, konkrečiai nagrinėdamas sveikatos bendruomenes. Perkeliant dėmesį į šį tarpinį lygį, mokslinis tyrimas meta iššūkį vyraujančioms mokslinių tyrimų tradicijoms ir suteikia naujų įžvalgų apie bendruomenės sveikatos iniciatyvų dinamiką. Tyrimas parodo naują atvirų inovacijų požiūrį sveikatos bendruomenių lygmeniu. Siūloma nauja „atvirų sveikatos bendruomenių" koncepcija, pabrėžianti žinių kūrimo ir perdavimo sveikatos bendruomenių tinkluose potencialą.

Metodologiškai tyrimas parodo naujumą sukuriant originalų pusiau struktūrinį interviu įrankį, pritaikytą konkrečiam tyrimo kontekstui. Šis metodologinis patobulinimas užtikrina duomenų autentiškumą ir turtingumą, užtikrindamas išsamų nagrinėjamų klausimų tyrimą.

Galiausiai, kalbant apie empirinį tyrimą, ši disertacija išsiskiria kaip vienas iš novatoriškų kokybinių tyrimų, tiriančių sveikatos bendruomenes ir jose veikiančius žinių perdavimo mechanizmus. Sutelkiant dėmesį į šią nepakankamai ištirtą sritį, tyrimas išplečia mokslinį diskursą už tradiciškai tiriamų didelių organizacijų ir verslo sektoriaus ribų, atskleidžiant unikalią žinių valdymo dinamiką visuomenės sveikatos sektoriuje.

Praktinė tyrimo rezultatų reikšmė

Siekiant giliau suvokti fenomenologinį sveikatos bendruomenių reiškinį, tyrimo instrumentas gali būti taikomas praplečiant empirinius tyrimus lauke. Remiantis empirinių kokybinių tyrimų rezultatais, siūlomos aiškios vadybos ir politikos rekomendacijos, skatinančios atvirą inovacijų diegimą sveikatos bendruomenėse.

Tyrime pateikiamos praktinės gairės, kaip bendruomenės nariai gali dalytis, kartu kurti ir perduoti žinias, kad skatintų inovacijų sukūrimą. Praktinės rekomendacijos, gautos atlikus tyrimą, gali padėti palengvinti bendradarbiavimą kuriant komunikacijos kanalus, skatinant pasitikėjimą ir skatinant žinių perdavimo kultūrą sveikatos bendruomenėse.

Kokybinio tyrimo išvados pabrėžia aktyvaus lyderio dalyvavimo, skatinant inovacijas sveikatos bendruomenėse, svarbą. Tyrimas atskleidžia, kad bendruomenės, kuriose veikia aktyvūs lyderiai, kurdami kartu su bendruomenės nariais, pasiekia geresnių inovacijų rezultatų.

Parengtas žinių perdavimo modelis atvirose sveikatos bendruomenėse gali būti naudojamas kaip pagrindas atviroms sveikatos bendruomenėms plėsti savo inovacinę veiklą.

Tyrimų metodologija

1. Atvirų sveikatos bendruomenių samprata: buvo atlikta literatūros apžvalga ir turinio analizė, siekiant visapusiškai suprasti atvirų sveikatos bendruomenių funkcijas

ir vaidmenis perduodant žinias. Siekiant išskirti pagrindinius konceptualius elementus, buvo išnagrinėti kokybiniai duomenų šaltiniai, įskaitant mokslinius straipsnius, bendruomenės diskusijas ir organizacinius dokumentus.

2. Konceptualių santykių pagrindimas: tyrime taikytas konceptualios analizės metodas, siekiant nustatyti ryšius tarp sveikatos bendruomenių, jų atvirumo ir žinių perdavimo. Analizė apėmė esamų teorijų ir modelių vertinimus ir sintezę, prisidėdama prie konceptualios sistemos kūrimo.

3. Tyrimo metodikos kūrimas: buvo sukurta tyrimo metodika, skirta kokybiškai analizuoti žinių perdavimo mechanizmus atvirose sveikatos bendruomenėse. Metodikos kūrimas apėmė interviu protokolų kūrimą ir stebėjimo metodus, pritaikytus keitimosi žiniomis niuansams atviroje sveikatos bendruomenės aplinkoje.

4. Empirinis žinių perdavimo mechanizmų tyrimas atvirose sveikatos bendruomenėse: empirinis duomenų rinkimas, atliekamas interviu ir stebėjimais, siekiant nustatyti formuojančius procesus, įgalinančius veiksnius ir kliūtis, turinčias įtakos žinių perdavimui. Kokybinė duomenų analizė, įskaitant teminį kodavimą ir modelių atpažinimą, naudojamą siekiant gauti įžvalgų iš surinktų empirinių duomenų.

5. Empiriškai pagrįsto modelio kūrimas: tyrimas baigiasi empiriškai pagrįsto modelio sukūrimu, siekiant palengvinti žinių perdavimą atvirose sveikatos bendruomenėse. Modelis buvo sukurtas remiantis empirinio tyrimo išvadomis, integruojant praktines įžvalgas, gautas iš tyrimo duomenų.

Pasirinkta tyrimo metodologija siejasi su pasirinktomis filosofinėmis prieigomis (ontologija – konstruktyvistinė filosofinė pozicija; epistemiologinė prieiga – interpretatyvistinė), apima visuminį tyrimo dizainą. Tyrimo metodologija remiasi organizacinės elgsenos teorija, atlikta sistemine literatūros analize bei teoriniais tyrimais. Disertacijoje pasirinktam fenomenui išnagrinėti atlikta literatūros analizė, kurioje išskirti pagrindiniai sveikatos bendruomenių tipai ir žinių perdavimo komponentai.

Atsižvelgiant į mokslinėje literatūroje ribotą atvirų sveikatos bendruomenių tyrinėjimą, jų žinių valdymo ypatumus ir pritaikymą, nustatytas poreikis atlikti kokybinį tyrimą. Tyrimu siekiama užpildyti kokybinių tyrimų spragą sveikatos bendruomenių tyrimuose. Atviros sveikatos bendruomenės pasižymi dideliu neapčiuopiamumu, nes joms trūksta formalios struktūros, pagrįstų procesų ir žinių valdymo sistemų (Hajli, 2014; Rupert ir kt., 2014; Kordzadeh ir kt., 2016). Siekiant išnagrinėti šį fenomeną, kokybinis indukcinis tyrimo metodas, kuris padeda suformuoti naujus konceptualius rezultatus, buvo pasirinktas kaip tinkamiausias. Tokio tipo tyrimo metu nagrinėjamas fenomenas yra išanalizuojamas, paaiškinamas ir, remiantis gautais rezultatais, vystomos naujos teorinės įžvalgos.

Kokybiniam tyrimui atlikti yra pasirinktas susietos atvejo analizės metodas, kuriuo siekiama įžvelgti dalyvių perspektyvas ir interpretacijas, susijusias su konkrečia analizuojama problema (Gerring, 2007). Atliekami kokybiniai interviu (pusiau struktūruoto interviu metodu) ir papildoma trianguliacijos metodu, kuriame remiamasi esamos literatūros bei praktinių šaltinių tyrinėjimu.

Tiriant žinių srautus sveikatos bendruomenėse laikomasi į pacientą orientuoto požiūrio, dėmesį skiriant moters viso gyvenimo sveikatos klausimams. Pirminiame

tyrime atrinkta 19 dalyvių, kurios buvo apklaustos Lietuvos sveikatos mokslų universiteto Kauno klinikose. Šie interviu buvo atliekami nuo 2018 m. rugsėjo mėn. iki 2019 m. gruodžio mėn. 3 interviu vėliau neįtraukti į galutinę duomenų analizę. Iš viso į galutinį tyrimą buvo įtraukta 16 interviu. Šiame tyrimo etape buvo sukurti preliminarūs sveikatos bendruomenių žinių valdymo srautai, pabrėžiant būtinybę toliau plėsti ir tęsti tyrimus.

2020-aisiais prasidėjus COVID-19 pandemijai, išryškėjo sveikatos bendruomenės skaitmeninimo svarba, žinių kūrimas ir perdavimas persikėlė į virtualią erdvę, išaugo internetinių sveikatos bendruomenių populiarumas. Siekiant išsamesnės informacijos ir sistemingai išanalizuoti konkrečios situacijos dinamiką bei išsiaiškinti mažiau akivaizdžius aspektus, palyginti su pirminiu tyrimu (Tellis, 1997; Rahim, Baksh, 2003), tyrimas buvo pratęstas įtraukiant virtualias bendruomenes.

Antrasis etapas, kaip išplėstinis kokybinis tyrimas, buvo atliktas nuo 2021 m. rugsėjo mėn. iki 2023 m. kovo mėn. Amžiaus diapazonas ir sveikatos bendruomenės buvo išplėstos pagal moterų viso gyvenimo sveikatos logiką. Buvo pritaikytas pusiau struktūrizuotas interviu (Frechtling, Sharp, 1997; Kvale, 2007), siekiant įgyti naujų įžvalgų, atskleidžiant skirtingus žmonių požiūrius ir nuomones su tikslinančiais ir (arba) papildomais klausimais (Tidikis, 2003; Braun, Clarke, 2013). Per šį interviu formatą daliai dalyvių buvo suteikta galimybė išsakyti savo nuomonę, o prireikus buvo pateikti papildomi ar patikslinantys klausimai. Interviu gairės paremtos iš atitinkamos literatūros gautais rodikliais ir pritaikytos iš 1-ojo etapo klausimyno, siekiant užtikrinti nuoseklumą su tyrimo klausimais.

Tyrime dalyvavo 14 moterų, kurios lankėsi 7 skirtingose atvirose virtualiose sveikatos bendruomenėse. Kiekvienas interviu paprastai truko nuo pusvalandžio iki valandos. Interviu dokumentavimas buvo užtikrintas įrašant interviu, o vėliau transkribuojant pačiai autorei. Perrašyti duomenys buvo koduojami ir analizuojami, siekiant atskleisti naujas duomenų temas ir modelius.

2-asis etapas išlieka kaip tyrimo išplėtimas, apimantis platesnį bendruomenių ratą, apimantį tiek tiesiogines, tiek internetines bendruomenes ir turintis didžiulę vertę gerinant mūsų supratimą apie žinių perdavimą ir atviras naujoves sveikatos bendruomenėse. Toks požiūris suteiks išsamesnės temos perspektyvos ir įžvalgų, kurios gali padėti kurti veiksmingas strategijas ir intervencijas, skatinančias dalijimąsi žiniomis ir inovacijas šiose bendruomenėse.

Kokybinių tyrimo metodų etinės atsargumo priemonės apima tyrimo dalyvių apsaugos, privatumo ir savanoriško dalyvavimo užtikrinimą. Prieš pradedant apklausti tyrimo dalyvius, buvo gautas jų žodinis sutikimas dalyvauti tyrime:

- Informacija ir konfidencialumas: dalyviams buvo paaiškintas tyrimo tikslas, kiekvienam dalyviui buvo užtikrinta, kad jų tapatybė ir asmeninė informacija išliks konfidenciali ir anonimiška, o jų asmens duomenys nebus viešai skelbiami;
- Savanoriškas dalyvavimas: dalyvavimas tyrime buvo savanoriškas ir dalyviams buvo užtikrinta, kad jie turi laisvę bet kuriuo metu pasitraukti nepatiriant neigiamų pasekmių.

- Pagarba autonomijai: atvejo tyrimas atliktas nedarant įtakos pacientų atsakymams, siekiant atskleisti bendrus modelius mokslo tikslus. Dalyvio teisės saugomos siekiant išlaikyti tyrimo vientisumą ir prisidėti prie žinių tobulinimo, laikantis etikos standartų.

Duomenų analizės procesas apėmė kelis etapus, įskaitant kodavimą, skirstymą į kategorijas, pagrindinių temų nustatymą ir teorijos kūrimą. Siekiant palengvinti didelio duomenų kiekio analizę ir integruoti skirtingus informacijos rinkinius, buvo naudojama programinė įranga MAXQDA Analytics Pro 2022. Ši programinė įranga buvo pasirinkta dėl jos galimybių valdyti didelius duomenų rinkinius ir palengvinti kokybinę analizę.

Taigi susietos atvejo analizės metodas sujungia teorinėmis konstrukcijomis iškeltus tyrimo uždavinius bei empiriniu ištyrimu nagrinėjamus atvirųjų sveikatos bendruomenių vaidmenis ir žinių perdavimo svarbą kuriant sveikatos inovacijas,

Rezultatai

Šiais laikais visuomenės sveikata yra aukščiausiame populiarumo taške nei kada nors anksčiau. Žmonėms vis labiau domintis sveikata, šis populiarumas matosi visuose sektoriuose. Vadybos mokslai ne išimtis – daugybė vadybos krypties mokslininkų tyrinėja sveikatos ekosistemas, sveikatos digitalizavimą, sveikatos inovacijas, sveikatos organizacijų valdymą ir kt. Žinių valdymas sveikatos sektoriuje – ne išimtis, tačiau, itin sparčiai kuriantis naujoms bendrystės formoms, daugybė jų lieka neištirtos moksliškai.

Sveikatos bendruomenės – viena iš mažiausiai tirtų formų sveikatos sektoriuje. Nors galima rasti įvairių panašių terminų literatūroje, sveikatos bendruomenės terminas yra palyginti naujas. Vadybos mokslų kryptyje šis fenomenas dar neturi konkretaus termino ir, kaip rodo mokslinių tyrimų analizė, tirtas tik atskiromis dalimis.

Dauguma mokslinių tyrimų orientuojasi į bendruomenės sveikatą, tačiau tai visai kitas konceptas. Bendruomenės sveikata – konkrečioje geografinėje bendruomenėje vykstantys sveikatos dalykai, jų vadyba. Sveikatos bendruomenė – tai žmonės, nepriklausomai nuo geografinės sudėties, susibūrę dėl konkrečios sveikatos temos. Sveikatos bendruomenių tyrimuose dažniausiai sutinkami internete bendruomenių tyrimai – tiriamos grupės įvairiose socialinėse ar kitose platformose. Tiesioginių (gyvų) sveikatos bendruomenių tyrimų sutinkama labai mažai. Autorės žiniomis, mokslinio tyrimo, kuris aprėptų tiek tiesiogines, tiek virtualias sveikatos bendruomenes žinių valdymo ar inovacijų vystymo kontekstuose, iki šiol dar nebuvo atlikta. Taigi, tai pirmasis kokybinis tyrimas, apimantis tiek tiesiogines, tiek virtualias atvirąsias sveikatos bendruomenes žinių valdymo kontekste.

Atlikus teorinį tyrimą buvo išskirti du pagrindiniai sveikatos bendruomenių tipai: tiesioginis ir virtualus. Tačiau atliekant empirinį ištyrimą, bendraujant su interviu dalyviais ir analizuojant rezultatus daroma prielaida, kad egzistuoja ir trečiasis, vis dar netirtas sveikatos bendruomenės tipas – mišraus tipo sveikatos bendruomenė. Mišraus tipo bendruomenių vis dar yra nedaug, ir jos nebuvo aktualios pradėjus šį

tyrimą, tačiau, išanalizavus visus duomenis, ateities tyrimams siūloma įtraukti šį tipą į tolimesnius sveikatos bendruomenių tyrimus.

Šiame tyrime tiriamos sveikatos bendruomenės laikomos atvirosiomis sveikatos bendruomenėmis pagal atvirųjų inovacijų principus. Bendruomenės yra atviros prisijungti naujiems nariams (yra ribojimų, tačiau nedidelių), bendruomenės yra atviros bendradarbiavimui su kitais subjektais ir svarbiausias atvirųjų inovacijų principas – jog bendruomenės dalijasi žiniomis iš bendruomenės į išorę bei naudojasi iš išorės atėjusiomis žiniomis. Atvirąsias inovacijas taikančios bendruomenės yra vadinamos atvirosiomis sveikatos bendruomenėmis.

Atlikus atvirųjų sveikatos bendruomenių empirinį tyrimą žinių valdymo kontekste numatyti keturi svarbiausi faktoriai: informaciniai šaltiniai, žinių valdymo veiksniai, žinių perdavimo fasilitatoriai ir žinių perdavimo įtaka inovatyvumo rezultatams.

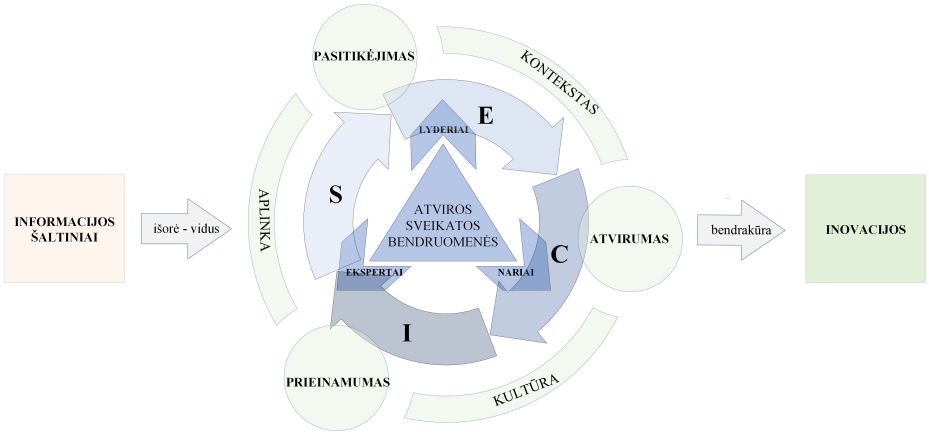
Informaciniai atvirųjų sveikatos bendruomenių šaltiniai – tai pirminis informacijos šaltinis, kuriuo pacientas (bendruomenės narys) remiasi kurdamas savo žinias bei priimdamas sveikatos sprendimus. Tai labai svarbus, pamatinis veiksnys, norint suprasti visą bendruomenės žinių dinamiką. Informacijos šaltiniai vadybos mokslo tyrimuose dažnai laikomi pagrindiniais nusakančiais ryšius tarp narių. Šiame darbe nustatyta, kad pagrindiniais savo informaciniai šaltiniais, kuriais remiasi darydami savo sveikatos sprendimus, bendruomenės nariai laiko (dėstymo eiliškumas ryšio svarbai neaktualus): pačią sveikatos bendruomenę ir jos ryšius (bendruomenės lyderį, kitus narius, dalyvaujantį medicinos personalą bei išorės verslo ir mokslo subjektus), įvairią literatūrą (knygas, filmus, žurnalus, lankstinukus ar mokslinę literatūrą), internete esančius šaltinius (paieškos sistemas, socialinius tinklus, mobiliąsias aplikacijas, įvairius pokalbių langus bei sekamas įžymybes), giminaičius (partnerius, sutuoktinius, tėvus, brolius ir seseris, draugus) bei medicinos personalą (gydytojus, medicinos seseris, akušeres bei kitus). Svarbiausias informacijos šaltinis išlieka medicinos personalas – tyrimo dalyviai linkę pasitikėti medicinos personalo skleidžiamomis žiniomis, tačiau skundžiasi nepakankamu šio informacijos šaltinio prieinamumu, todėl ieško alternatyvių šaltinių ir būdų atsakyti į kylančius klausimus. Tai parodo sveikatos sistemos spragas – perdegusi Lietuvos sveikatos sistema vis dar nepriima pacientų, kuriems ne tik aktualu išspręsti situacijas, tačiau kyla medicininių klausimų, taip pat nesukuria erdvės atsakyti į klausimus, kurie tuo metu nėra svarbūs. Pacientams rūpimą informaciją galėtų suteikti ir kiti sveikatos priežiūros specialistai, nebūtinai gydytojai, o, pavyzdžiui, visuomenės sveikatos specialistai. Eilės, žinių nesuderinamumas tarp informacinių šaltinių, nepasitikėjimas arba per didelis pasitikėjimas savo turimomis žiniomis buvo išreikšti kaip vieni iš barjerų teisingai sveikatos informacijai gauti.

Bendruomenės tirtos ir remiantis SECI modeliu (Nonaka ir Takeuchi, 1995). Keturi pagrindiniai modelio veiksniai buvo ištirti susiejant su identifikuotais veiksmais sveikatos bendruomenėse: socializacija, eksternalizacija, kombinacija ir internalizacija. Lyginant sveikatos bendruomenes tarpusavyje, tiesioginio tipo sveikatos bendruomenėje pasireiškė visos žinių perdavimo fazės, o virtualiose bendruomenėse rezultatai kito: dauguma virtualių bendruomenių neperžengia

socializacijos fazės žinių kūrimo procese. Vienintelės virtualios bendruomenės nariai išreiškė, jog žinių kūrimo procesas vyksta per visas modelio fazes. Taip pat kai kurių bendruomenių žinių kūrimas nevedė prie galutinio rezultato dėl proceso spragų– ne visos išpildomos dalys privedė prie menko inovacijų efektyvumo.

Buvo ištirti pagrindiniai žinių valdymo proceso skatintojai. Tirti šių skatintojų pagrindiniai įgalintojai, barjerai ir poreikiai. Prieinamumas, pasitikėjimas, atvirumas ir demokratizavimas buvo sukurti kaip pagrindinės skatintojų grupės žinioms perduoti, sugrupavus visus dalyvių atsakymus. Kiekvienu šių atvejų buvo išsakyta, kaip tai gali padėti ar trukdyti perduoti žinias, rasti dalyvių poreikiai šiems skatintojams pagerinti. Pagrindiniai atsakiusiųjų bendruomenės narių poreikiai atviroms sveikatoms bendruomenėms buvo nurodyti kaip efektyvi lyderystė, struktūrizuota ir patikima informacija, sveikatos priežiūros profesionalų dalyvavimas, informacijos gavimas nedelsiant bei konkretūs ir žinomi veiksmų planai bei dalyvių aktyvus įtraukimas į juos. Įdomu tai, kad, išpildžius bendruomenės narių poreikius, ir pati atviroji sveikatos bendruomenė galėtų būti tvaresnė ir vesti į reikšmingesnius inovacijų rezultatus.

Paskutinioji svarbių rezultatų grupė buvo išskirta kaip žinių perdavimo įtaka atviųjų sveikatos bendruomenių inovatyvumui. Nors visi išvardinti rezultatai prisideda prie žinių perdavimo proceso atviroje sveikatos bendruomenėje, taip lydint bendruomenę į inovacijų rezultatus, tačiau kalbant apie pačių kuriamas inovacijas bendruomenių narių atsakymai pasiskirstė į tris dideles grupes: bendrakūra, įsipareigojimai ir organizavimas. Bendruomenių narių atsakymai šiose grupėse įvardino, ar bendruomenės yra sukūrusios inovacijų, kaip jas perduoda į išorę, koks buvo narių arba ne bendruomenės narių įsitraukimas į inovacijų kūrimą ir kokie pagrindiniai atviųjų sveikatos bendruomenių organizavimo poreikiai, kad inovacijų rezultatai būtų sėkmingesni. Tyrimo dalyviai įvardijo patikimos aplinkos bei narių profesionalų svarbą inovacijų kūrimo procese, taip pat išreiškė nuomonę, kad bendruomenės nariai galėtų būti labiau įtraukiami į inovacijų kūrimo procesą kaip bendrakūriai, o ne tik kaip inovacijų vartotojai.



5.1 pav. Žinių perdavimo atvirose sveikatos bendruomenėse modelis

Sukurtas žinių perdavimo atviroms sveikatos bendruomenėms modelis yra reikšminga pažanga sprendžiant su žinių perdavimu atvirose sveikatos bendruomenėse susijusius iššūkius. Derinant bendruomenės skatinamą kuravimą, modelis sukuria veiksmingo ir patikimo keitimosi informacija pagrindą, skatina bendradarbiavimo aplinką, siekiant tobulinti su sveikata susijusias žinias. Žinių perdavimo atvirose sveikatos bendruomenėse modelis (žr. 5.1 pav.) yra sukurtas remiantis empirinio tyrimo rezultatais ir atsižvelgiant į atvirųjų sveikatos bendruomenių unikalias ypatybes.

Išvados

1. Atviros sveikatos bendruomenės apibūdina bendradarbiavimo ir įtraukiamų individų, organizacijų ir suinteresuotųjų šalių tinklą sveikatos srityje, skatinant dinamišką idėjų, žinių ir ekspertiškų žinių mainų procesą. Sveikatos bendruomenės sąvoka apibūdina esamų sveikatos žinių šaltinį, skirtą bendruomenės nariams paremti. Sveikatos bendruomenė siekia gerinti sveikatos priežiūros sritį dalijantis esamomis žiniomis bei kuriant naujas:

1.1. Atvirosios sveikatos bendruomenės buvo suskirstytos į du pagrindinius tipus: tiesiogines ir internetines. Tiriant empiriškai, buvo pasiūlytas trečias atviro tipo sveikatos bendruomenių tipas: hibridinis tipas.

1.2. Sveikatos bendruomenės atvirumas pabrėžia prieinamumo ir priimtinumo laipsnį atviroje sveikatos bendruomenėje, leidžiant laisvai cirkuliuoti informacijai ir idėjoms.

1.3. Atvirosios sveikatos bendruomenės koordinavimas apima suderintus veiksmus, siekiant palengvinti efektyvias sąveikas tarp bendruomenės narių, maksimizuojant žinių mainų ir inovacijų galimybes.

2. Ryšys tarp atvirų sveikatos bendruomenių, jų atvirumo, žinių perdavimo ir bendruomenių skatinamų inovacijų yra pagrindinis aspektas, norint suprasti šių bendruomenių dinamiką:

2.1. Atvirumas sveikatos bendruomenėse skatina įvairovę ir įtrauktą aplinką, kurioje gali klestėti skirtingos perspektyvos ir idėjos. Ši įvairovė dažnai lemia inovatyvių sprendimų kūrimą, kurie galbūt nebūtų atsiradę uždarame kontekste.

2.2. Žinių perdavimas yra pagrindinis bendruomenių kuriamų inovacijų pagrindas. Gebėjimas dalintis ir integruoti žinias iš įvairių informacijos šaltinių, tiek bendruomenėje, tiek už jos ribų, pagerina kūrybinį ir problemų sprendimo procesą. Taip pat aktyvus bendruomenės narių dalyvavimas žinių perdavimo ir bendradarbiavimo veikloje didina jų atsakomybę už inovacijų rezultatus.

2.3. Bendruomenės koordinavimas ir gebėjimas valdyti inovacijų procesą, taip pat jos atvirumas vaidina lemiamą vaidmenį perduodant žinias ir jas paverčiant į praktines inovacijas. Efektyvus vadovavimas, struktūrizuota informacija ir sveikatos priežiūros specialistų įsitraukimas yra pagrindiniai elementai.

3. Originali kokybinio tyrimo metodika buvo sukurta siekiant moksliškai paaiškinti, kaip turėtų būti organizuojamas ir įgalinamas žinių perdavimas atvirose sveikatos bendruomenėse, siekiant bendruomenės kuriamų inovacijų. Kruopščiai apsvarsčius įvairius kokybinius tyrimo metodus, atsirado struktūrizuota duomenų

rinkimo ir analizės sistema. Ši sistema ne tik leido tyrinėti įvairias perspektyvas ir patirtį, bet ir palengvino pagrindinių žinių perdavimo procesų temų ir modelių nustatymą. Kokybinio tyrimo metodologijos sukūrimas reiškia reikšmingą žingsnį link žinių perdavimo atvirose sveikatos bendruomenėse sudėtingumo išaiškinimo. Pateikiant struktūrinį tyrimo metodą, ši metodika įgalina mokslininkus atskleisti įžvalgas, kurios gali padėti kurti strategijas, kaip pagerinti bendrakūrą, inovacijas, ir galiausiai gerinti sveikatos rezultatus.

4. Atvirų sveikatos bendruomenių, žinių perdavimo ir bendruomenių kuriamoms inovacijoms santykių suvokimas yra būtinas, norint suprasti šių unikalių sistemų dinamiką. Šiame kontekste į fokusą patenka keturi pagrindiniai elementai: informacijos šaltiniai, žinių valdymo veiklos, žinių valdymo skatinimai ir žinių perdavimo įtaka inovatyvumui.

4.1. Atvirų sveikatos bendruomenių nariai naudojasi įvairiais informacijos šaltiniais. Nustatyti pagrindiniai atviruųjų informacijos šaltiniai: pati sveikatos bendruomenė ir jos ryšiai (bendruomenės lyderis, kiti nariai, dalyvaujantys medicinos ekspertai, išorinės verslo ir mokslinės įstaigos), įvairūs literatūros šaltiniai (knygos, filmai, žurnalai, plakatai ar mokslinė literatūra), interneto šaltiniai (paieškos sistemos, socialiniai tinklai, mobiliosios programos, įvairūs pokalbių langai ir sekami žinomi asmenys), artimieji (partneriai, sutuoktiniai, tėvai, broliai, draugai) ir medicinos ekspertai (gydytojai, slaugytojai, akušeriai ir kt.). Svarbiausias informacijos šaltinis vis dar yra medicinos ekspertai – tyrimo dalyviai patvirtino, kad jų žinios vis dar išlieka patikimiausios.

4.2. Žinių perdavimo veiklos apima žinių rinkimo, organizavimo, sklaidos ir taikymo procesus atvirose sveikatos bendruomenėse. Remiantis Nonaka ir Takeuchi (1995) SECI modeliu, buvo ištirtos pagrindinės žinių perdavimo veiklos, susijusios su identifikuotomis sveikatos bendruomenių veiklomis: socializacija, eksternalizacija, kombinacija, internalizacija. Tiesioginėse, asmeniškose bendruomenėse pastebėti visi SECI modelio etapai. Pagrindinis lūžis virtualiose bendruomenėse dažnai yra pirmuose SECI modelio etapuose, ypač socializacijos. Internetinių bendruomenių nariai dažnai dalyvauja diskusijose, dalijasi informacija. Tačiau ryškus skirtumas išryškėja etapuose po socializacijos. Tiesioginės bendruomenės geriau ir tikslingiau išnaudoja žinių kūrimo etapus.

4.3. Ištirta, kad žinių perdavimo procesą atvirose sveikatos bendruomenėse pagerina keli veiksniai: (1) prieinamumas, (2) pasitikėjimas, (3) atvirumas ir (4) demokratizacija.

4.4. Atviruųjų sveikatos bendruomenių narių pagrindiniai poreikiai buvo nurodyti kaip efektyvus vadovavimas, struktūrizuota ir patikima informacija, sveikatos priežiūros specialistų dalyvavimas, momentinis prieigos prie informacijos užtikrinimas, konkretūs ir žinomi veiksmų planai ir bendruomenės dalyvių aktyvus dalyvavimas juose. Įdomu, kad tyrimas rodo, jog, atitinkant bendruomenės narių poreikius, susijusius su šiais skatinimo elementais, galima ne tik sukurti reikšmingesnes ir įtaką turinčias inovacijas, bet ir padidinti atviruųjų sveikatos bendruomenių darnumą. Tai pabrėžia ryšį tarp žinių perdavimo skatinimo efektyvumo ir atvirose sveikatos bendruomenėse vykstančių inovacijų sėkmės.

4.5. Žinių perdavimo įtaka atvirų sveikatos bendruomenių inovatyvumui – kuo efektyviau žinios perduodamos nariams ir už bendruomenės ribų, tuo labiau jos skatina inovacijas bendruomenėje. Tyrimo metu nustatyta, kad tiesioginėse atvirose sveikatos bendruomenėse yra daugiau bendrakūros veiklų nei internetinėse bendruomenėse, tiesioginėse atvirose sveikatos bendruomenėse buvo sukurti kai kurie inovatyvūs produktai ir perduoti išorinėms šalims. Dauguma internetinių bendruomenių paprastai nenaudoja bendrakūros kaip priemonės inovacijoms kurti. Tyrimo dalyviai pabrėžė patikimos aplinkos kūrimo svarbą ir medicinos specialistų įtraukimo į inovacijų kūrimo procesą.

5. Sukurtas žinių perdavimo modelis, siekiant palengvinti inovacijas atvirose sveikatos bendruomenėse. Remiantis įžvalgomis ir išvadomis, modelis buvo sukurtas remiantis kokybinio tyrimo rezultatais ir apima pagrindines išvadas.

REFERENCES

1. Abidi, S. L. (2001). Chromatographic analysis of plant sterols in foods and vegetable oils. *Journal of Chromatography A*, *935*(1–2), 173–201. Elsevier BV. Retrieved from https://doi.org/10.1016/s0021-9673(01)00946-3
2. Åhgren, B., & Axelsson, R. (2007). Determinants of integrated health care development: chains of care in Sweden. *International Journal of Health Planning and Management*, *22*(2), 145–157. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/hpm.870
3. Alavi, M., & Leidner, D. E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and research issues. *Management Information Systems Quarterly*, *25*(1), 107. MIS Quarterly. Retrieved from https://doi.org/10.2307/3250961
4. Alba, J. W., & Hutchinson, J. W. (2000). Knowledge calibration: what consumers know and what they think they know. *Journal of Consumer Research*, *27*(2), 123–156. Oxford University Press. Retrieved from https://doi.org/10.1086/314317
5. Allarakhia, M. (2015). Exploring open innovation with a patient focus in drug discovery: an evolving paradigm of patient engagement. *Expert Opinion on Drug Discovery*, *10*(6), 571–578. Retrieved from https://10.1517/17460441.2015.1037271
6. Aluwihare-Samaranayake, D. (2012). Ethics in Qualitative Research: A View of the Participants' and Researchers' World from a Critical Standpoint. *International Journal of Qualitative Methods*, 11(2), 64–81. Retrieved from https://doi.org/10.1177/160940691201100208
7. Amann, J., & Rubinelli, S. (2017). Views of Community Managers on knowledge co-creation in online communities for people with Disabilities: Qualitative study. *Journal of Medical Internet Research*, *19*(10), e320. JMIR Publications. Retrieved from https://doi.org/10.2196/jmir.7406
8. Ancori, B., Bureth, A., & Cohendet, P. (2000). The economics of knowledge: the debate about codification and tacit knowledge. *Industrial and Corporate Change*, *9*(2), 255–287. Oxford University Press. Retrieved from https://doi.org/10.1093/icc/9.2.255
9. Aref, H., Blake, J. R., Budišić, M., Cardoso, S. S. S., Cartwright, J.H. E., Clercx, H. H., Omari, K. E., et al. (2017). Frontiers of chaotic advection. *Reviews of Modern Physics*, *89*(2). American Physical Society. Retrieved from https://doi.org/10.1103/revmodphys.89.025007
10. Argote, L., & Ingram, P. (2000). Knowledge transfer: a basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, *82*(1), 150–169. Elsevier BV. Retrieved from https://doi.org/10.1006/obhd.2000.2893
11. Atanasova, S., Kamin, T., & Petrič, G. (2017). Exploring the benefits and challenges of health professionals' participation in online health communities: Emergence of (dis)empowerment processes and outcomes. *International Journal of Medical Informatics*, *98*, 13–21. Elsevier BV. Retrieved from https://doi.org/10.1016/j.ijmedinf.2016.11.005
12. Atanasova, S., Kamin, T., & Petrič, G. (2018). The benefits and challenges of online professional-patient interaction: Comparing views between users and health professional moderators in an online health community. *Computers in Human Behavior*, *83*, 106–118. Elsevier BV. Retrieved from https://doi.org/10.1016/j.chb.2018.01.031

13. Bærøe, K. (2008). Priority setting in health care: on the relation between reasonable choices on the micro-level and the macro-level. *Theoretical Medicine and Bioethics*, *29*(2), 87–102. Springer Science+Business Media. Retrieved from https://doi.org/10.1007/s11017-008-9063-3
14. Barasa, E., Molyneux, S., English, M., & Cleary, S. (2015). Setting healthcare priorities at the macro and MESO levels: a framework for evaluation. *International Journal of Health Policy and Management*, *4*(11), 719–732. Kerman Medical University. Retrieved from https://doi.org/10.15171/ijhpm.2015.167
15. Bath, J., & Wakerman, J. (2015). Impact of community participation in primary health care: what is the evidence? *Australian Journal of Primary Health*, *21*(1), 2. CSIRO Publishing. Retrieved from https://doi.org/10.1071/py12164
16. Battistella, C., De Toni, A. F., & Pillon, R. (2015). Inter-organisational technology/knowledge transfer: a framework from critical literature review. *The Journal of Technology Transfer*, *41*(5), 1195–1234. Retrieved from https://doi.org/10.1007/s10961-015-9418-7
17. Beresford, P. (2019). Public participation in health and social Care: Exploring the co-production of knowledge. *Frontiers in Sociology*, *3*. Frontiers Media. Retrieved from https://doi.org/10.3389/fsoc.2018.00041
18. Bergerum, C., Thor, J., Josefsson, K., & Wolmesjö, M. (2019). How might patient involvement in healthcare quality improvement efforts work—A realist literature review. *Health Expectations*, *22*(5), 952–964. Wiley. Retrieved from https://doi.org/10.1111/hex.12900
19. Bitinas, B., Rupšienė, L., & Žydžiūnaitė, V. (2008). *Kokybinių tyrimų metodologija : vadovėlis vadybos ir administravimo studentams*. Retrieved from https://www.lituanistika.lt/content/25145
20. Blanchet, K., & James, P. (2012). The role of social networks in the governance of health systems: the case of eye care systems in Ghana. *Health Policy and Planning*, *28*(2), 143–156. Oxford University Press. Retrieved from https://doi.org/10.1093/heapol/czs031
21. Bogers, M., Zobel, A.-K., Afuah, A., Almirall, E., Brunswicker, S., Dahlander, L., Frederiksen, L., et al. (2016). The open innovation research landscape: established perspectives and emerging themes across different levels of analysis. *Industry and Innovation*, *24*(1), 8–40. Taylor & Francis. Retrieved from https://doi.org/10.1080/13662716.2016.1240068
22. Bose, R. (2003). Knowledge management-enabled health care management systems: capabilities, infrastructure, and decision-support. *Expert Systems With Applications*, *24*(1), 59–71. Retrieved from https://10.1016/s0957-4174(02)00083-0
23. Bouamrane, M.-M., Tao, C., & Sarkar, I. N. (2015). Managing interoperability and complexity in health systems. *Methods of Information in Medicine*, *54*(01), 01–04. Schattauer Verlag. Retrieved from https://doi.org/10.3414/me15-10-0001
24. Braun, V., & Clarke, V. (2016). Successful qualitative research: A practical guide for beginners. *QMiP Bulletin*, *1*(21), 48–50. Retrieved from https://doi.org/10.53841/bpsqmip.2016.1.21.48
25. Brownson, R. C., Gurney, J. G., & Land, G. H. (1999). Evidence-Based decision making in public health. *Journal of Public Health Management and Practice*, *5*(5), 86–97. Lippincott Williams & Wilkins. Retrieved from https://doi.org/10.1097/00124784-199909000-00012
26. Budhwar, P., & Cumming, D. J. (2020). New Directions in Management Research and Communication: Lessons from the COVID-19 Pandemic. *British Journal of*

Management, *31*(3), 441–443. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/1467-8551.12426
27. Bullinger, A. C., Rass, M., Adamczyk, S., Moeslein, K. M., & Sohn, S. (2012). Open innovation in health care: Analysis of an open health platform. *Health Policy*, *105*(2–3), 165–175. Retrieved from https://10.1016/j.healthpol.2012.02.009
28. Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice*, 2(1). Retrieved from https://doi.org/10.1186/s42466-020-00059-z
29. Carman, K. L., & Workman, T. A. (2017). Engaging patients and consumers in research evidence: Applying the conceptual model of patient and family engagement. *Patient Education and Counseling*, *100*(1), 25–29. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2016.07.009
30. Castro, E. M., Van Regenmortel, T., Sermeus, W., & Vanhaecht, K. (2018). Patients' experiential knowledge and expertise in health care: A hybrid concept analysis. *Social Theory and Health*, *17*(3), 307–330. Palgrave Macmillan. Retrieved from https://doi.org/10.1057/s41285-018-0081-6
31. Castro, E. M., Van Regenmortel, T., Vanhaecht, K., Sermeus, W., & Van Hecke, A. (2016). Patient empowerment, patient participation and patient-centeredness in hospital care: A concept analysis based on a literature review. *Patient Education and Counseling*, *99*(12), 1923–1939. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2016.07.026
32. Chatterji, A., & Fabrizio, K. R. (2013). Using users: When does external knowledge enhance corporate product innovation? *Strategic Management Journal*, *35*(10), 1427–1445. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/smj.2168
33. Chau, T., Moghimi, S., & Popovic, M. R. (2013). Knowledge Translation in Rehabilitation Engineering Research and Development: A Knowledge Ecosystem Framework. *Archives of Physical Medicine and Rehabilitation*, *94*(1), S9–S19. Elsevier BV. Retrieved from https://doi.org/10.1016/j.apmr.2012.07.032
34. Cherrington, A. (2010, January 1). Recognizing the diverse roles of community health workers in the elimination of health disparities: from paid staff to volunteers. *PubMed Central (PMC)*. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3695477/
35. Chesbrough, H. (2003). The Era of Open Innovation. *MITSloan Management Review*, 33–41. Retrieved from https://sloanreview.mit.edu/article/the-era-of-open-innovation/
36. Chesbrough, H. (2006). *Open Innovation: The New Imperative for Creating and Profiting from Technology* (First Trade Paper.). Harvard , US: Harvard Business Review Press.
37. Chesbrough, H. (2007). Business model innovation: it's not just about technology anymore. *Strategy & Leadership*, *35*(6), 12–17. Retrieved from https://10.1108/10878570710833714
38. Chesbrough, H., Vanhaverbeke, W., & West, J. (2014). *New Frontiers in Open Innovation*. Oxford, United Kingdom: Oxford University Press.
39. Christensen, C. M., & Raynor, M. (2003). The Innovator's Solution Creating and Sustaining Successful Growth. Harvard Business School Press. - References - Scientific Research Publishing. (n.d.). . Retrieved from https://www.scirp.org/(S(czeh2tfqw2orz553k1w0r45))/reference/referencespapers.aspx?referenceid=3132055

40. Chua, A. Y. K., & Lam, W. (2005). Why KM projects fail: a multi-case analysis. *Journal of Knowledge Management*, *9*(3), 6–17. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/13673270510602737
41. Clifford, T. (2003). Book: A Life Course Approach to Women's Health. *BMJ*, *326*(7394), 887. BMJ. Retrieved from https://doi.org/10.1136/bmj.326.7394.887
42. Cohendet, P., Créplet, F., & Dupouët, O. (2001). Communities of Practice and Epistemic Communities: A Renewed Approach of Organizational Learning within... *ResearchGate*. Retrieved from https://www.researchgate.net/publication/228587324_Communities_of_Practice_and_Epistemic_Communities_A_Renewed_Approach_of_Organizational_Learning_within_the_Firm
43. Colineau, N., & Paris, C. (2010). Talking about your health to strangers: understanding the use of online social networks by patients. *The New Review of Hypermedia and Multimedia*, *16*(1–2), 141–160. Taylor & Francis. Retrieved from https://doi.org/10.1080/13614568.2010.496131
44. Concannon, T. W., Grant, S., Welch, V., Petkovic, J., Selby, J. V., Crowe, S., Synnot, A., et al. (2018). Practical guidance for involving stakeholders in health research. *Journal of General Internal Medicine*, *34*(3), 458–463. Springer Science Business Media. Retrieved from https://doi.org/10.1007/s11606-018-4738-6
45. Conceição, C., Grimaud, O., McCarthy, M., Barnhoorn, F., Sammut, M., Saliba, A., Katreniakova, Z., et al. (2013). Programmes and calls for public health research in European countries. *Eur J Public Health*, *23*(suppl 2), 30–34. Retrieved from https://doi.org/10.1093/eurpub/ckt152
46. Cori, L., Bianchi, F., Sprovieri, M., Cuttitta, A., Ruggieri, S., Alessi, A. L., Biondo, G., et al. (2019). Communication and community involvement to support risk governance. *International Journal of Environmental Research and Public Health*, *16*(22), 4356. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/ijerph16224356
47. Coyne, I., McNamara, N., Healy, M., Gower, C., Sarkar, M., & McNicholas, F. (2015). Adolescents' and parents' views of Child and Adolescent Mental Health Services (CAMHS) in Ireland. *Journal of Psychiatric and Mental Health Nursing*, *22*(8), 561–569. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/jpm.12215
48. Creswell, J. W. (2001). Educational research: planning, conducting, and evaluating quantitative and qualitative research. Retrieved from http://ci.nii.ac.jp/ncid/BB26859968
49. C.L., & Morales, A. (2007). Qualitative Research designs. *The Counseling Psychologist*, 35(2), 236–264. Retrieved from https://doi.org/10.1177/0011000006287390Crotty, M. (2020). *The foundations of social research*. *Routledge eBooks*. Retrieved from https://doi.org/10.4324/9781003115700
50. Dahlander, L., Frederiksen, L., & Rullani, F. (2008). Online communities and open innovation. *Industry and Innovation*, *15*(2), 115–123. Taylor & Francis. Retrieved from https://doi.org/10.1080/13662710801970076
51. Dandonoli, P. (2013). Open innovation as a new paradigm for global collaborations in health. *Globalization and Health*, *9*(1), 41. BioMed Central. Retrieved from https://doi.org/10.1186/1744-8603-9-41
52. Davenport, T. H., & Prusak, L. (1998). Working knowledge: how organizations manage what they know. *Choice Reviews Online*, *35*(09), 35–5167. Association of

College and Research Libraries. Retrieved from https://doi.org/10.5860/choice.35-5167
53. Davis, C. J., Golding, M., & McKay, R. (2021). Efficacy information influences intention to take COVID-19 vaccine. *British Journal of Health Psychology*, *27*(2), 300–319. British Psychological Society. Retrieved from https://doi.org/10.1111/bjhp.12546
54. Davis, J. R., Richard, E. E., & Keeton, K. E. (2015). Open Innovation at NASA: a new business model for advancing human health and performance innovations. *Research-technology Management*, *58*(3), 52. Taylor & Francis. Retrieved from https://repository.exst.jaxa.jp/dspace/handle/a-is/572235
55. De Coninck, D., Frissen, T., Matthijs, K., D'Haenens, L., Lits, G., Champagne-Poirier, O., Carignan, M.-E., et al. (2021). Beliefs in conspiracy theories and Misinformation about COVID-19: Comparative perspectives on the role of anxiety, depression and exposure to and trust in information sources. *Frontiers in Psychology*, *12*. Frontiers Media. Retrieved from https://doi.org/10.3389/fpsyg.2021.646394
56. Di Benedetto, C. A., Lindgreen, A., Storgaard, M., & Clarke, A. H. (2019). How to collaborate really well with practitioners. *Industrial Marketing Management*, *82*, 1–8. Elsevier BV. Retrieved from https://doi.org/10.1016/j.indmarman.2019.08.001
57. Dudovskiy, J. (2018). The ultimate guide to writing a dissertation in business studies. University of Pittsburgh: Pittsburgh, PA, USA. Retrieved from
58. Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. K. (2008). Inter-Organizational Knowledge Transfer: Current themes and future prospects. *Journal of Management Studies*, *45*(4), 677–690. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/j.1467-6486.2008.00773.x
59. Easterby-Smith, M., Thorpe, R., Jackson, P. R., & Jaspersen, L. J. (2018). Management and business research. SAGE Publications Limited.
60. Eisenhardt, K. M. (1989). Building theories from case study research. Academy of Management Review, 14, 532-550. - References - Scientific Research Publishing. (n.d.). . Retrieved from https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=148432
61. Faraj, S., Jarvenpaa, S. L., & Majchrzak, A. (2011). Knowledge collaboration in online communities. *Organization Science*, *22*(5), 1224–1239. Institute for Operations Research and the Management Sciences. Retrieved from https://doi.org/10.1287/orsc.1100.0614
62. Farrer, L., Marinetti, C., Cavaco, Y. K., & Costongs, C. (2015). Advocacy for Health Equity: A synthesis review. *Milbank Quarterly*, *93*(2), 392–437. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/1468-0009.12112
63. Fasnacht, D. (2018). Open innovation in the financial services. *Management for professionals* (pp. 97–130). Retrieved from https://doi.org/10.1007/978-3-319-76394-1_4
64. Fernandes, S., Cesário, M., & Barata, J. (2017). Ways to open innovation: Main agents and sources in the Portuguese case. *Technology in Society*, *51*, 153–162. Elsevier BV. Retrieved from https://doi.org/10.1016/j.techsoc.2017.09.002
65. Fischer, F., & Mandell, A. (2009). Michael Polanyi's Republic of Science: The Tacit Dimension. *Science as Culture*, *18*(1), 23–46. Taylor & Francis. Retrieved from https://doi.org/10.1080/09505430802705889
66. Floch, J., Zettl, A., Fricke, L., Weisser, T., Grut, L., Vilarinho, T., Stav, E., et al. (2018). User needs in the development of a health app ecosystem for Self-

Management of Cystic Fibrosis: User-Centered Development Approach. *Jmir Mhealth and Uhealth*, *6*(5), e113. JMIR Publications. Retrieved from https://doi.org/10.2196/mhealth.8236

67. Flynn, L. R., & Goldsmith, R. E. (1999). A short, reliable measure of subjective knowledge. *Journal of Business Research*, *46*(1), 57–66. Elsevier BV. Retrieved from https://doi.org/10.1016/s0148-2963(98)00057-5
68. Forehand, R., Lafko, N., Parent, J., & Burt, K. B. (2014). Iparenting the mediator of change in behavioral parent training for externalizing problems of youth? *Clinical Psychology Review*, *34*(8), 608–619. Elsevier BV. Retrieved from https://doi.org/10.1016/j.cpr.2014.10.001
69. Foss, N. J., Husted, K., & Michailova, S. (2010). Governing knowledge sharing in organizations: levels of analysis, governance mechanisms, and research directions. *Journal of Management Studies*, *47*(3), 455–482. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/j.1467-6486.2009.00870.x
70. Frieden, T. R. (2010). A framework for public health action: the Health Impact Pyramid. *American Journal of Public Health*, *100*(4), 590–595. American Public Health Association. Retrieved from https://doi.org/10.2105/ajph.2009.185652
71. Füller, J., & Matzler, K. (2007). Virtual product experience and customer participation—A chance for customer-centred, really new products. *Technovation*, *27*(6–7), 378–387. Elsevier BV. Retrieved from https://doi.org/10.1016/j.technovation.2006.09.005
72. Füller, J., Matzler, K., & Hoppe, M. (2008). Brand community members as a source of innovation. *Journal of Product Innovation Management*, *25*(6), 608–619. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/j.1540-5885.2008.00325.x
73. Gabriel, P., McManus, M., Rogers, K., & White, P. (2017). Outcome Evidence for Structured Pediatric to Adult Health Care Transition Interventions: A Systematic Review. *The Journal of Pediatrics*, *188*, 263-269.e15. Retrieved from https://10.1016/j.jpeds.2017.05.066
74. Gabriel, Stanley, I., & Saunders, T. (2017). *Open innovation in health* (1st ed.). Nesta. Retrieved from https://media.nesta.org.uk/documents/open_innovation_in_health_0.pdf
75. Garavan, T. N., Carbery, R., & Murphy, E. (2007). Managing intentionally created communities of practice for knowledge sourcing across organisational boundaries. *The Learning Organization*, *14*(1), 34–49. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/09696470710718339
76. Gaviria-Marin, M., Merigó, J. M., & Baier-Fuentes, H. (2019). Knowledge management: A global examination based on bibliometric analysis. *Technological Forecasting and Social Change*, *140*, 194–220. Elsevier BV. Retrieved from https://doi.org/10.1016/j.techfore.2018.07.006
77. George, A., Mehra, V., Scott, K., & Sriram, V. (2015). Community Participation in Health Systems Research: A Systematic Review Assessing the State of Research, the Nature of Interventions Involved and the Features of Engagement with Communities. (X. Li, Ed.)*PLOS ONE*, *10*(10), e0141091. Retrieved from https://10.1371/journal.pone.0141091
78. Gerring, J., & McDermott, R. (2007). An experimental template for case study research. *American Journal of Political Science*, *51*(3), 688–701. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/j.1540-5907.2007.00275.x

79. Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012). Seeking qualitative rigor in inductive research. Organizational Research Methods, 16(1), 15–31. Retrieved from https://doi.org/10.1177/1094428112452151
80. Goater, S., Derne, B. T., & Weinstein, P. (2011). Critical issues in the development of health information systems in supporting environmental health: A case study of Ciguatera. *Environmental Health Perspectives*, *119*(5), 585–590. National Institute of Environmental Health Sciences. Retrieved from https://doi.org/10.1289/ehp.1002575
81. Goggin, G., & Ellis, K. (2020). Disability, communication, and life itself in the COVID-19 pandemic. *Health Sociology Review*, *29*(2), 168–176. Taylor & Francis. Retrieved from https://doi.org/10.1080/14461242.2020.1784020
82. Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge Management: An Organizational Capabilities perspective. *Journal of Management Information Systems*, 18(1), 185–214. https://doi.org/10.1080/07421222.2001.11045669
83. Gourlay, S. (2006). Conceptualizing Knowledge Creation: A critique of Nonaka's theory. *Journal of Management Studies*, *43*(7), 1415–1436. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/j.1467-6486.2006.00637.x
84. Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, *17*(S2), 109–122. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/smj.4250171110
85. Greenhalgh, T., Hinton, L., Finlay, T., Macfarlane, A., Fahy, N., Clyde, B., & Chant, A. D. B. (2019). Frameworks for supporting patient and public involvement in research: Systematic review and co-design pilot. *Health Expectations*, *22*(4), 785–801. Wiley. Retrieved from https://doi.org/10.1111/hex.12888
86. Greenhalgh, T., Jackson, C., Shaw, S., & Janamian, T. (2016). Achieving Research Impact Through Co-creation in Community-Based Health Services: Literature Review and Case Study. *The Milbank Quarterly*, *94*(2), 392–429. Retrieved from https://doi.org/10.1111/1468-0009.12197
87. Gustavsson, S., Gremyr, I., & Sarenmalm, E. K. (2015). Designing quality of care - contributions from parents. *Journal of Clinical Nursing*, *25*(5–6), 742–751. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/jocn.13050
88. Hajli, N. (2014). A study of the impact of social media on consumers. *International Journal of Market Research*, *56*(3), 387–404. SAGE Publishing. Retrieved from https://doi.org/10.2501/ijmr-2014-025
89. Haldane, V., Chuah, F. L. H., Srivastava, A., Singh, S., Koh, G. C.-H., Seng, C. K., & Legido-Quigley, H. (2019). Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes. *PLOS ONE*, *14*(5), e0216112. Public Library of Science. Retrieved from https://doi.org/10.1371/journal.pone.0216112
90. Hamilton, C. B., Hoens, A. M., Backman, C. L., McKinnon, A., McQuitty, S., English, K., & Li, L. (2017). An empirically based conceptual framework for fostering meaningful patient engagement in research. *Health Expectations*, *21*(1), 396–406. Wiley. Retrieved from https://doi.org/10.1111/hex.12635
91. Handžić, M., Brătianu, C., & Bolisani, E. (2021). Scientific associations as communities of practice for fostering collaborative knowledge building: Case study of IAKM. Electronic Journal of Knowledge Management, 19(2), pp91-104. https://doi.org/10.34190/ejkm.19.2.2369
92. Hannemann-Weber, H. (2011). Influence of team composition and knowledge sharing on the ability to innovate in patient-centered healthcare teams for rare

diseases. *Journal of Management & Marketing in Healthcare*, *4*(4), 265–272. Retrieved from https://doi.org/10.1179/1753304x11y.0000000014
93. Hannemann-Weber, H., & Schultz, C. (2014). The impact of health care professionals' service orientation on patients' innovative behavior. *PubMed*, *39*(4), 329–339. National Institutes of Health. Retrieved from https://pubmed.ncbi.nlm.nih.gov/23896657
94. Hansen, M. T., Nohria, N., & Tierney, T. M. (1999). What's your strategy for managing knowledge? *PubMed*, *77*(2), 106–16, 187. National Institutes of Health. Retrieved from https://pubmed.ncbi.nlm.nih.gov/10387767
95. Haynes, E., Marawili, M., Marika, B. M., Mitchell, A. M., Phillips, J., Bessarab, D., Walker, R., et al. (2019). Community-based participatory action research on rheumatic heart disease in an Australian Aboriginal homeland: Evaluation of the 'On track watch' project. *Evaluation and Program Planning*, *74*, 38–53. Elsevier BV. Retrieved from https://doi.org/10.1016/j.evalprogplan.2019.02.010
96. Hill, A., Loh, P.-R., Bharadwaj, R. B., Pons, P., Shang, J., Guinan, E., Lakhani, K., et al. (2017). Stepwise Distributed Open Innovation Contests for Software Development: Acceleration of Genome-Wide Association Analysis. *GigaScience*, *6*(5).
97. Hilliard, M. E., Sparling, K., Hitchcock, J., Oser, T. K., & Hood, K. K. (2015). The emerging diabetes online community. *Current Diabetes Reviews*, *11*(4), 261–72. Bentham Science Publishers. Retrieved from https://doi.org/10.2174/1573399811666150421123448
98. Hollweck, T. (2015). Robert K. Yin. (2014). *Case Study Research Design and Methods (5th ed.). The Canadian Journal of Program Evaluation*, *30*(1), 108–110. University of Toronto Press. Retrieved from https://doi.org/10.3138/cjpe.30.1.108
99. Hoon Chuah, F., Srivastava, A., Singh, S., Haldane, V., Huat Koh, G., Seng, C., McCoy, D., et al. (2018). Community participation in general health initiatives in high and upper-middle income countries: A systematic review exploring the nature of participation, use of theories, contextual drivers and power relations in community participation. *Social Science & Medicine*, *213*, 106–122.
100. Hopia, H., Punna, M., Laitinen, T., & Latvala, E. (2015). A patient as a self-manager of their personal data on health and disease with new technology – challenges for nursing education. *Nurse Education Today*, *35*(12), e1–e3. Elsevier BV. Retrieved from https://doi.org/10.1016/j.nedt.2015.08.017
101. Hsieh, H., Lin, H., Shih, S., & Chen, C. (2015). Ecosystem Functions Connecting Contributions from Ecosystem Services to Human Wellbeing in a Mangrove System in Northern Taiwan. *International Journal of Environmental Research and Public Health*, *12*(6), 6542–6560. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/ijerph120606542
102. Hudson, L. A., & Ozanne, J. L. (1988). Alternative ways of seeking knowledge in consumer research. *Journal of Consumer Research*, *14*(4), 508. Oxford University Press. Retrieved from https://doi.org/10.1086/209132
103. Hussain, A., Ali, S., Ahmed, M., & Hussain, S. (2018). The Anti-vaccination Movement: A Regression in Modern Medicine. *Cureus*, 2919.
104. Hussey, P., Tully, M., Farrell, S., Coyne, E., Connolly, P., Glynn, C., Qurashi, M. Z., et al. (2019). Building infrastructure for digital health using Open innovation 2.0 in co design of a meta data registry framework to support integrated care. *International Journal of Integrated Care*, *19*(4), 18. Ubiquity Press. Retrieved from https://doi.org/10.5334/ijic.s3018

105. Im, D., Pyo, J., Lee, H., Jung, H., & Ock, M. (2023). Qualitative research in healthcare: data analysis. *Journal of Preventive Medicine and Public Health*, 56(2), 100–110. Retrieved from https://doi.org/10.3961/jpmph.22.471
106. Jacobides, M. G., Cennamo, C., & Gawer, A. (2018). Towards a theory of ecosystems. *Strategic Management Journal*, *39*(8), 2255–2276. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/smj.2904
107. Jindrová, P., & Labudová, V. (2020). The impact of socio-economic and demographic determinants on self-perceived health. *E+M. Ekonomie a Management*, *23*(4), 68–88. Technical University of Liberec. Retrieved from https://doi.org/10.15240/tul/001/2020-4-005
108. Johnston, K., Chen, M.-M., & Hauman, M. (2013). Use, perception and attitude of university students towards Facebook and Twitter. *Electronic Journal of Information Systems Evaluation*, *16*(3). Academic Conferences and Publishing International. Retrieved from https://academic-publishing.org/index.php/ejise/article/view/253
109. Jones, M., Jallinoja, P., & Pietilä, I. (2020). Representing the 'Voice' of Patients: How third sector organisations conceptualise and communicate experiential knowledge in health service development. *Voluntas*, *32*(3), 561–572. Springer Science+Business Media. Retrieved from https://doi.org/10.1007/s11266-020-00296-5
110. Josefsson, U. (2005). Coping with Illness Online: The Case of Patients'Online Communities. *The Information Society*, *21*(2), 133–141. Taylor & Francis. Retrieved from https://doi.org/10.1080/01972240590925357
111. Jucevičienė, P., & Šajeva, S. (2012). Žinių valdymas. *KTU leidykla "Technologija" eBooks*. Retrieved from https://doi.org/10.5755/e01.9786090204672
112. Jull, J., Giles, A. R., & Graham, I. D. (2017). Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. *Implementation Science*, *12*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s13012-017-0696-3
113. Kallinikos, J., & Tempini, N. (2014). Patient data as Medical Facts: Social media practices as a foundation for medical knowledge creation. *Information Systems Research*, *25*(4), 817–833. Institute for Operations Research and the Management Sciences. Retrieved from https://doi.org/10.1287/isre.2014.0544
114. Kayoka, C., Itimu-Phiri, A., Biran, A., & Holm, R. H. (2019). Lasting results: A qualitative assessment of efforts to make community-led total sanitation more inclusive of the needs of people with disabilities in Rumphi District, Malawi. *Disability and Health Journal*, *12*(4), 718–721. Elsevier BV. Retrieved from https://doi.org/10.1016/j.dhjo.2019.05.007
115. Khan, G., Hoffman, M., & Misztur, T. (2014). Best Practices in Social Media at Public, Nonprofit, Education, and Health Care Organizations. *Social Science Computer Review*, *32*(5), 571–574.
116. Khubchandani, J., Sharma, S. K., Price, J. H., Wiblishauser, M., Sharma, M., & Webb, F. J. (2021). COVID-19 Vaccination hesitancy in the United States: A rapid national assessment. *Journal of Community Health*, *46*(2), 270–277. Springer Science+Business Media. Retrieved from https://doi.org/10.1007/s10900-020-00958-x
117. King, C., Murillo, E., Wei, W., Madera, J. M., Tews, M. J., Israeli, A. A., & Kong, L. (2019). Towards a shared understanding of the service experience – a hospitality stakeholder approach. *Journal of Service Management*, *30*(3), 410–428. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/josm-11-2018-0375

118. Kitson, A., Powell, K., Hoon, E., Newbury, J., Wilson, A., & Beilby, J. (2013). Knowledge translation within a population health study: how do you do it? *Implementation Science*, *8*(1). BioMed Central. Retrieved from https://doi.org/10.1186/1748-5908-8-54
119. Klucken, J., Krüger, R., Schmidt, P., & Bloem, B. R. (2018). Management of Parkinson's Disease 20 Years from Now: Towards Digital Health Pathways. *Journal of Parkinson's Disease*, *8*(s1), S85–S94. IOS Press. Retrieved from https://doi.org/10.3233/jpd-181519
120. Köhler, T., & Chesbrough, H. (2019). From collaborative community to competitive market: the quest to build a crowdsourcing platform for social innovation. *R & D Management*, *49*(3), 356–368. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/radm.12372
121. Kordzadeh, N., Warren, J. E., & Seifi, A. (2016). Antecedents of privacy calculus components in virtual health communities. *International Journal of Information Management*, *36*(5), 724–734. Elsevier BV. Retrieved from https://doi.org/10.1016/j.ijinfomgt.2016.04.015
122. Kozinets, R. V. (2002). The Field behind the Screen: Using Netnography for Marketing Research in Online Communities. *Journal of Marketing Research*, *39*(1), 61–72. American Marketing Association. Retrieved from https://doi.org/10.1509/jmkr.39.1.61.18935
123. Krathwohl, D. R. (2002). A revision of Bloom's Taxonomy: An Overview. *Theory Into Practice*, *41*(4), 212–218. Taylor & Francis. Retrieved from https://doi.org/10.1207/s15430421tip4104_2
124. Kraushaar, D., Kieny, M.-P., Lazarus, J. V., Bermejo, R., Abimbola, S., Prashanth, N. S., Flores, W., et al. (2012). Health Systems Global, the new international society for health systems research. *Health Policy and Planning*, *27*(7), 535–540. Oxford University Press. Retrieved from https://doi.org/10.1093/heapol/czs079
125. Krawczyk, M., Sawatzky, R., Schick-Makaroff, K., Stajduhar, K., Öhlén, J., Reimer-Kirkham, S., Laforest, E., et al. (2018). Micro-Meso-Macro practice tensions in using Patient-Reported outcome and experience measures in hospital palliative care. *Qualitative Health Research*, *29*(4), 510–521. SAGE Publishing. Retrieved from https://doi.org/10.1177/1049732318761366
126. Kvale, S. (2007). *Doing interviews*. Retrieved from https://doi.org/10.4135/9781849208963
127. Lagos-Quintana, M., Rauhut, R., Lendeckel, W., & Tuschl, T. (2001). Identification of novel genes coding for small expressed RNAs. *Science*, *294*(5543), 853–858. American Association for the Advancement of Science. Retrieved from https://doi.org/10.1126/science.1064921
128. Laihonen, H. (2012). Knowledge structures of a health ecosystem. *Journal of Health Organization and Management*, *26*(4), 542–558.
129. Lakhani, K. R., & Von Hippel, E. (2004). How open source software works: "Free" User-to-User assistance. *Gabler Verlag eBooks* (pp. 303–339). Retrieved from https://doi.org/10.1007/978-3-322-84540-5_13
130. Landers, G. M., Minyard, K., Lanford, D., & Heishman, H. (2020). A Theory of change for aligning health care, public health, and social services in the time of COVID-19. *American Journal of Public Health*, *110*(S2), S178–S180. American Public Health Association. Retrieved from https://doi.org/10.2105/ajph.2020.305821
131. Lave, J., & Wenger, E. (1991). *Situated learning*. Retrieved from https://doi.org/10.1017/cbo9780511815355

132. Lazarus, J. V., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H., Rabin, K., Kimball, S., et al. (2020). A global survey of potential acceptance of a COVID-19 vaccine. *Nature Medicine*, *27*(2), 225–228. Nature Portfolio. Retrieved from https://doi.org/10.1038/s41591-020-1124-9
133. Lee, J.-W. (2005). Public health is a social issue. *The Lancet*, *365*(9464), 1005–1006. Elsevier BV. Retrieved from https://doi.org/10.1016/s0140-6736(05)71115-6
134. Leite, H., Lindsay, C., & Kumar, M. (2020). COVID-19 outbreak: implications on healthcare operations. *The Tqm Journal*, *33*(1), 247–256. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/tqm-05-2020-0111
135. Leonard, D. A., & Sensiper, S. (2011). The role of tacit knowledge in group innovation. *WORLD SCIENTIFIC eBooks* (pp. 301–323). Retrieved from https://doi.org/10.1142/9789814295505_0013
136. Levinson, W., Kao, A., Kuby, A. M., & Thisted, R. A. (2005). Not all patients want to participate in decision making. *Journal of General Internal Medicine*, *20*(6), 531–535. Springer Science+Business Media. Retrieved from https://doi.org/10.1111/j.1525-1497.2005.04101.x
137. Li, L., Grimshaw, J., Nielsen, C., Judd, M., Coyte, P. C., & Graham, I. D. (2009). Evolution of Wenger's concept of community of practice. *Implementation Science*, *4*(1). BioMed Central. Retrieved from https://doi.org/10.1186/1748-5908-4-11
138. Lillrank, P., Torkki, P., Venesmaa, J., & Malmström, T. (2011). Regional Healthcare Service Systems: A Conceptualization of the Meso-Level of Healthcare. *BMC Med*. Retrieved from https://doi.org/10.1109/srii.2011.17t
139. Lin, H. (2007). Knowledge sharing and firm innovation capability: an empirical study. *International Journal of Manpower*, 28(3/4), 315–332. Retrieved from https://doi.org/10.1108/01437720710755272
140. Lin, X., & Kishore, R. (2021). Social media-enabled healthcare: A conceptual model of social media affordances, online social support, and health behaviors and outcomes. *Technological Forecasting and Social Change*, *166*, 120574. Elsevier BV. Retrieved from https://doi.org/10.1016/j.techfore.2021.120574
141. Lisiecka-Biełanowicz, M., & Wawrzyniak, Z. M. (2016). Healthcare model with use of information and communication technology for patients with chronic disease. *Annals of Agricultural and Environmental Medicine*. Institute of Rural Health. Retrieved from https://doi.org/10.5604/12321966.1219188
142. Liu, Z., Shi, Y., & Yang, B. (2022). Open Innovation in Times of Crisis: An overview of the healthcare sector in response to the COVID-19 pandemic. *Journal of Open Innovation*, *8*(1), 21. Springer Science+Business Media. Retrieved from https://doi.org/10.3390/joitmc8010021
143. Loignon, C., Dupéré, S., Fortin, M., Ramsden, V. R., & Truchon, K. (2018). Health literacy – engaging the community in the co-creation of meaningful health navigation services: a study protocol. *BMC Health Services Research*, *18*(1). Springer Science+Business Media. Retrieved from https://doi.org/10.1186/s12913-018-3315-3
144. Longtin, Y., Sax, H., Leape, L. L., Sheridan, S. E., Donaldson, L., & Pittet, D. (2010). Patient participation: current knowledge and applicability to patient safety. *Mayo Clinic Proceedings*, *85*(1), 53–62. Elsevier BV. Retrieved from https://doi.org/10.4065/mcp.2009.0248
145. Lough, B. J., & Toms, C. (2017). Global service-learning in institutions of higher education: concerns from a community of practice. *Globalisation, Societies and*

Education, *16*(1), 66–77. Taylor & Francis. Retrieved from https://doi.org/10.1080/14767724.2017.1356705
146. Lu, Y., Yang, W., Liu, J., Li, J., & Zhang, P. (2017). Understanding health care social media use from different stakeholder perspectives: A content analysis of an online health community. *Journal of Medical Internet Research*, *19*(4), e109. JMIR Publications. Retrieved from https://doi.org/10.2196/jmir.7087
147. Lunn, P. (2020). Using behavioural science to help fight the coronavirus. ESRI Working Paper No. 656 March 2020 - Archive of European Integration. Retrieved June 1, 2021, from http://aei.pitt.edu/102644/
148. Magnezi, R., Grosberg, D., Novikov, I., Ziv, A., Shani, M., & Freedman, L. S. (2014). Characteristics of patients seeking health information online via social health networks versus general Internet sites: a comparative study. *Informatics for Health & Social Care*, *40*(2), 125–138. Taylor & Francis. Retrieved from https://doi.org/10.3109/17538157.2013.879147
149. Maloney-Krichmar, D., & Preece, J. (2005). A multilevel analysis of sociability, usability, and community dynamics in an online health community. *ACM Transactions on Computer-Human Interaction*, *12*(2), 201–232. Association for Computing Machinery. Retrieved from https://doi.org/10.1145/1067860.1067864
150. Marmot, M. (2005). Social determinants of health inequalities. *The Lancet*, *365*(9464), 1099–1104. Elsevier BV. Retrieved from https://doi.org/10.1016/s0140-6736(05)71146-6
151. Marston, C., Renedo, A., & Miles, S. (2020). Community participation is crucial in a pandemic. *The Lancet*, *395*(10238), 1676–1678. Elsevier BV. Retrieved from https://doi.org/10.1016/s0140-6736(20)31054-0
152. Martínez-Cañas, R., Ruiz-Palomino, P., Linuesa-Langreo, J., & Resino, J. J. B. (2016). Consumer Participation in co-creation: an enlightening model of causes and effects based on ethical values and transcendent motives. *Frontiers in Psychology*, *7*. Frontiers Media. Retrieved from https://doi.org/10.3389/fpsyg.2016.00793
153. Mavragani, A., & Ochoa, G. (2018). The Internet and the Anti-Vaccine Movement: Tracking the 2017 EU Measles Outbreak. *Big Data and Cognitive Computing*, *2*(1), 2.
154. May, C. (2015). Making sense of technology adoption in healthcare: meso-level considerations. *BMC Medicine*, *13*(1). Springer Science+Business Media. Retrieved from https://doi.org/10.1186/s12916-015-0305-8
155. May, Finch, Mair, Ballini, Dowrick, Eccles, Gask, et al. (2007). Understanding the implementation of complex interventions in health care: the normalization process model. *BMC Health Services Research*, *7*(1), 148.
156. Mays, G. P., Mamaril, C. B., & Timsina, L. (2016). Preventable death rates fell where communities expanded population health activities through multisector networks. *Health Affairs*, *35*(11), 2005–2013. Project HOPE. Retrieved from https://doi.org/10.1377/hlthaff.2016.0848
157. Maženytė, B., & Petraitė, M. (2019). Mediating knowledge across health ecosystems: a qualitative field study. *Measuring Business Excellence*, *24*(1), 52–68.
158. McCarron, T. L., Moffat, K. A., Wilkinson, G., Zelinsky, S., Boyd, J. E., White, D., Hassay, D. N., et al. (2019). Understanding patient engagement in health system decision-making: a co-designed scoping review. *Systematic Reviews*, *8*(1). Springer Science+Business Media. Retrieved from https://doi.org/10.1186/s13643-019-0994-8

159. McCartney, G., Collins, C., & Mackenzie, M. (2013). What (or who) causes health inequalities: Theories, evidence and implications? *Health Policy*, *113*(3), 221–227. Retrieved from https://10.1016/j.healthpol.2013.05.021
160. McDonald, B. (2020). Management and business research. *Action Learning: Research and Practice*, *17*(2), 245–250. Taylor & Francis. Retrieved from https://doi.org/10.1080/14767333.2020.1762378
161. McKenzie, J. F., & Pinger, R. R. (2014). *An introduction to community & public health*. Retrieved from https://ci.nii.ac.jp/ncid/BB16981207
162. McKibbon, K. A., Lokker, C., Keepanasseril, A., Colquhoun, H., Haynes, R. B., & Wilczynski, N. L. (2013). WhatisKT wiki: a case study of a platform for knowledge translation terms and definitions — descriptive analysis. *Implementation Science*, *8*(1). BioMed Central. Retrieved from https://doi.org/10.1186/1748-5908-8-13
163. McKinley, J. (2015). Critical Argument and Writer Identity: Social Constructivism as a theoretical Framework for EFL Academic writing. *Critical Inquiry in Language Studies*, *12*(3), 184–207. Taylor & Francis. Retrieved from https://doi.org/10.1080/15427587.2015.1060558
164. Meagher-Stewart, D., Solberg, S., Warner, G., MacDonald, J.-A., McPherson, C., & Seaman, P. (2012). Understanding the role of Communities of Practice in Evidence-Informed Decision Making in Public Health. *Qualitative Health Research*, *22*(6), 723–739. SAGE Publishing. Retrieved from https://doi.org/10.1177/1049732312438967
165. Melder, A., Burns, P., McLoughlin, I., & Teede, H. (2018). Examining 'institutional entrepreneurship' in healthcare redesign and improvement through comparative case study research: a study protocol. *BMJ Open*, *8*(8), e020807. BMJ. Retrieved from https://doi.org/10.1136/bmjopen-2017-020807
166. Menear, M., Blanchette, M.-A., Demers-Payette, O., & Roy, D. (2019). A framework for value-creating learning health systems. *Health Research Policy and Systems*, *17*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s12961-019-0477-3
167. Moon, K., & Blackman, D. (2014). A guide to understanding social science research for Natural Scientists. *Conservation Biology*, *28*(5), 1167–1177. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/cobi.12326
168. Nambisan, P. (2011). Information seeking and social support in online health communities: impact on patients' perceived empathy. *Journal of the American Medical Informatics Association*, *18*(3), 298–304. Oxford University Press. Retrieved from https://doi.org/10.1136/amiajnl-2010-000058
169. Nambisan, S., Siegel, D. S., & Kenney, M. (2018). On open innovation, platforms, and entrepreneurship. *Strategic Entrepreneurship Journal*, *12*(3), 354–368. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/sej.1300
170. Narteh, B. (2008). Knowledge transfer in developed-developing country interfirm collaborations: a conceptual framework. *Journal of Knowledge Management*, *12*(1), 78–91. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/13673270810852403
171. Ng, B. S. W., Schroeder, T., & Kayser, C. (2012). A Precluding But Not Ensuring Role of Entrained Low-Frequency Oscillations for Auditory Perception. *The Journal of Neuroscience*, *32*(35), 12268–12276. Society for Neuroscience. Retrieved from https://doi.org/10.1523/jneurosci.1877-12.2012
172. Nock, A. M., Metzing, S., Jürgensen, I.-N., & Petersen-Ewert, C. (2023). Health Literacy in Adults with Chronic Diseases in the Context of Community Health

Nursing: A Scoping Review. *Nursing Reports*, *13*(2), 823–834. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/nursrep13020072
173. Nonaka, I. (1991). The Knowledge Creating Company. *Harvard Business Review*, *69*, 96–104. Retrieved from https://hbr.org/2007/07/the-knowledge-creating-company
174. Nonaka, I, & Konno, N. (1998). The Concept of "Ba": Building a Foundation for Knowledge Creation. *California Management Review*, *40*(3), 40–54. Retrieved from https://10.2307/41165942
175. Nonaka, I, & Takeuchi, H. (1995). The knowledge-creating company. *Oxford University Press*, *71*(2), 89. Retrieved from https://hbr.org/2007/07/the-knowledge-creating-company
176. Nonaka, Ikujiro, Toyama, R., & Konno, N. (2000). SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Long Range Planning*, *33*(1), 5–34. Elsevier BV. Retrieved from https://doi.org/10.1016/s0024-6301(99)00115-6
177. Noruzi, F., Stenholm, D., Sjögren, P., & Bergsjö, D. H. (2018). A holistic model for inter-plant knowledge transfer within an international manufacturing network. *Journal of Knowledge Management*, *24*(3), 535–552. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/jkm-10-2017-0473
178. Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the Future — Big Data, Machine Learning, and Clinical Medicine. *New England Journal of Medicine*, *375*(13), 1216–1219.
179. Oliver, M., Geniets, A., Winters, N., Rega, I., & Mbae, S. M. (2015). What do community health workers have to say about their work, and how can this inform improved programme design? A case study with CHWs within Kenya. *Global Health Action*, *8*(1), 27168. Taylor & Francis. Retrieved from https://doi.org/10.3402/gha.v8.27168
180. Olmos-Peñuela, J., Benneworth, P. S., & Castro-Martínez, E. (2016). Does it take two to tango? Factors related to the ease of societal uptake of scientific knowledge. *Science & Public Policy*, scw016. Oxford University Press. Retrieved from https://doi.org/10.1093/scipol/scw016
181. Osborne, S. P., Radnor, Z., & Strokosch, K. (2016). Co-Production and the Co-Creation of Value in Public Services: A suitable case for treatment? *Public Management Review*, *18*(5), 639–653. Taylor & Francis. Retrieved from https://doi.org/10.1080/14719037.2015.1111927
182. Osei-Frimpong, K., Wilson, A., & Lemke, F. (2018). Patient co-creation activities in healthcare service delivery at the micro level: The influence of online access to healthcare information. *Technological Forecasting and Social Change*, *126*, 14–27. Elsevier BV. Retrieved from https://doi.org/10.1016/j.techfore.2016.04.009
183. Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge transfer, and organizational forms. *Organization Science*, *11*(5), 538–550. Institute for Operations Research and the Management Sciences. Retrieved from https://doi.org/10.1287/orsc.11.5.538.15204
184. Özdemir, V. (2018). Precision medicine goes global: How to get it right? Four ways to mobilize scientific knowledge. *Omics a Journal of Integrative Biology*, *22*(8), 539–543. Mary Ann Liebert, Inc. Retrieved from https://doi.org/10.1089/omi.2018.0104
185. Paavola, S., Lipponen, L., & Hakkarainen, K. (2004). Models of innovative knowledge communities and three metaphors of learning. *Review of Educational Research*, *74*(4), 557–576. SAGE Publishing. Retrieved from https://doi.org/10.3102/00346543074004557

186. Panda, A. C., & Mohapatra, S. (2021). Online Healthcare Practices and Associated Stakeholders: Review of literature for future Research agenda. *Vikalpa*, *46*(2), 71–85. SAGE Publishing. Retrieved from https://doi.org/10.1177/02560909211025361
187. Patrício, L., Sangiorgi, D., Mahr, D., Caic, M., Kalantari, S., & Sundar, S. (2020). Leveraging service design for healthcare transformation: toward people-centered, integrated, and technology-enabled healthcare systems. *Journal of Service Management*, *31*(5), 889–909. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/josm-11-2019-0332
188. Patton. M. Q. (2002). Qualitative research and evaluation methods (3rd ed.). Thousand Oaks, CA Sage Publications. - References - Scientific Research Publishing. (n.d.). . Retrieved from https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=757192
189. Pekonen, A., Eloranta, S., Stolt, M., Virolainen, P., & Leino-Kilpi, H. (2020). Measuring patient empowerment – A systematic review. *Patient Education and Counseling*, *103*(4), 777–787. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2019.10.019
190. Pennel, C. L., McLeroy, K. R., Burdine, J. N., & Matarrita-Cascante, D. (2015). Nonprofit hospitals' approach to community health needs assessment. *American Journal of Public Health*, *105*(3), e103–e113. American Public Health Association. Retrieved from https://doi.org/10.2105/ajph.2014.302286
191. Petiwala, A., Lanford, D., Landers, G. M., & Minyard, K. (2021). Community voice in cross-sector alignment: concepts and strategies from a scoping review of the health collaboration literature. *BMC Public Health*, *21*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s12889-021-10741-9
192. Petraitė, M., Janiūnaitė, B., Sekliuckienė, J., Čeičytė, J., Dlugoborskytė, V., Sedziniauskienė, R., & Užienė, L. (2018). Atviruųų inovacijų ekosistema Lietuvoje. *KTU*, 13–56. Retrieved from https://10.5755/e01.9786090215111
193. Petraite, M., & Mazenyte, B. (2018). *Communities creating health: application of open innovation perspective*. *ISPIM connects Fukuoka: building on innovation tradition, 2-5 December, 2018*. Retrieved from https://www.researchgate.net/publication/349192142_Communities_creating_health_application_of_open_innovation_perspective
194. Phelan, J. C., Link, B. G., & Tehranifar, P. (2010). Social Conditions as Fundamental Causes of Health Inequalities: theory, evidence, and Policy Implications. *Journal of Health and Social Behavior*, *51*(1_suppl), S28–S40. SAGE Publishing. Retrieved from https://doi.org/10.1177/0022146510383498
195. Pohjola, M., Pohjola, P., Tainio, M., & Tuomisto, J. T. (2013). Perspectives to Performance of Environment and Health Assessments and Models—From Outputs to Outcomes? *International Journal of Environmental Research and Public Health*, *10*(7), 2621–2642. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/ijerph10072621
196. Polanyi, M. (1966). The logic of tacit inference. *Philosophy*, *41*(155), 1–18. Cambridge University Press. Retrieved from https://doi.org/10.1017/s0031819100066110
197. Poteliūnienė, S. (2017). Review for the Textbook "Qualitative Research: Principles and Methods" By Vilma Žydžiūnaitė and Stanislav Sabaliauskas. *Sporto Mokslas*, *1*(87), 69–71. Retrieved from https://doi.org/10.15823/sm.2017.11

198. Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, *18*(3), 5–14. Elsevier BV. Retrieved from https://doi.org/10.1002/dir.20015
199. Priharsari, D., Abedin, B., & Mastio, E. (2020). Value co-creation in firm sponsored online communities. *Internet Research*, *30*(3), 763–788. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/intr-05-2019-0205
200. Prihodova, L., Guerin, S., Tunney, C., & Kernohan, W. (2018). Key components of knowledge transfer and exchange in health services research: Findings from a systematic scoping review. *Journal of Advanced Nursing*, *75*(2), 313–326. Retrieved from https://10.1111/jan.13836
201. Radaelli, G., Lettieri, E., Mura, M., & Spiller, N. (2014). Knowledge sharing and Innovative work behaviour in Healthcare: A Micro-Level Investigation of Direct and Indirect Effects. *Creativity and Innovation Management*, *23*(4), 400–414. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/caim.12084
202. Ramsay, A. M., Fulop, N., & Edwards, N. (2009). The evidence base for vertical integration in health care. *Journal of Integrated Care*, *17*(2), 3–12. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/14769018200900009
203. Randhawa, K., Josserand, E., Schweitzer, J., & Logue, D. (2017). Knowledge collaboration between organizations and online communities: the role of open innovation intermediaries. *Journal of Knowledge Management*, *21*(6), 1293–1318. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/jkm-09-2016-0423
204. Reichman, M., & Simpson, P. B. (2016). Open innovation in early drug discovery: roadmaps and roadblocks. *Drug Discovery Today*, *21*(5), 779–788. Elsevier BV. Retrieved from https://doi.org/10.1016/j.drudis.2015.12.008
205. Reinhardt, R., Bullinger, A. C., & Gurtner, S. (2014). Open Innovation in Health Care. *Challenges and Opportunities in Health Care Management*, 237–246. Retrieved from https://doi.org/10.1007/978-3-319-12178-9_19
206. Richardson, B., & Cooper, N. (2003). Developing a virtual interdisciplinary research community in higher education. *Journal of Interprofessional Care*, *17*(2), 173–182. Informa. Retrieved from https://doi.org/10.1080/1356182031000081777
207. Ridder, H. G. (2017). The theory contribution of case study research designs. *Business Research*, *10*(2), 281–305. Springer Nature. Retrieved from https://doi.org/10.1007/s40685-017-0045-z
208. Rifkin, S. B. (2014). Examining the links between community participation and health outcomes: a review of the literature. *Health Policy and Planning*, *29*(suppl 2), ii98–ii106. Oxford University Press. Retrieved from https://doi.org/10.1093/heapol/czu076
209. Riviere-Cinnamond, A., Santandreu, A., Luján, A., Mertens, F., Espinoza, J. O., Carpio, Y., Bravo, J., et al. (2018). Identifying the social and environmental determinants of plague endemicity in Peru: insights from a case study in Ascope, La Libertad. *BMC Public Health*, *18*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s12889-018-5062-0
210. Robert, G., Cornwell, J., Locock, L., Purushotham, A., Sturmey, G., & Gager, M. (2015). Patients and staff as codesigners of healthcare services. *BMJ*, g7714. BMJ. Retrieved from https://doi.org/10.1136/bmj.g7714
211. Romanelli, M. (2018). Towards sustainable ecosystems. *Systems Research and Behavioral Science*, *35*(4), 417–426. Wiley. Retrieved from https://doi.org/10.1002/sres.2541

212. Roozenbeek, J., Schneider, C. R., Dryhurst, S., Kerr, J. R., Freeman, A. L. J., Recchia, G., Van Der Bles, A. M., et al. (2020). Susceptibility to misinformation about COVID-19 around the world. *Royal Society Open Science*, *7*(10), 201199. Royal Society. Retrieved from https://doi.org/10.1098/rsos.201199
213. Rubinelli, S., Häfliger, C., Fiordelli, M., Ort, A., & Diviani, N. (2023). Institutional crisis communication during the COVID-19 pandemic in Switzerland. A qualitative study of the experiences of representatives of public health organizations. *Patient Education and Counseling*, *114*, 107813. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2023.107813
214. Ruckelshaus, M., McKenzie, E., Tallis, H., Guerry, A. D., Daily, G. C., Kareiva, P., Polasky, S., et al. (2015). Notes from the field: Lessons learned from using ecosystem service approaches to inform real-world decisions. *Ecological Economics*, *115*, 11–21. Elsevier BV. Retrieved from https://doi.org/10.1016/j.ecolecon.2013.07.009
215. Rupert, D., Moultrie, R., Read, J., Amoozegar, J., Bornkessel, A., O'Donoghue, A. C., & Sullivan, H. W. (2014). Perceived healthcare provider reactions to patient and caregiver use of online health communities. *Patient Education and Counseling*, *96*(3), 320–326. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2014.05.015
216. Russell, C. (2021). Supporting community participation in a pandemic. *Gaceta Sanitaria*, 184–187. Retrieved from https://doi.org/10.1016/j.gaceta.2021.01.001
217. Rutten, L. J. F., Zhu, X., Leppin, A. L., Ridgeway, J. L., Swift, M. D., Griffin, J. M., St Sauver, J. L., et al. (2021). Evidence-Based Strategies for Clinical Organizations to address COVID-19 vaccine hesitancy. *Mayo Clinic Proceedings*, *96*(3), 699–707. Elsevier BV. Retrieved from https://doi.org/10.1016/j.mayocp.2020.12.024
218. Sacks, E., Swanson, R. C., Schensul, J. J., Gleave, A., Shelley, K. D., Were, M., Chowdhury, A. M. R., et al. (2017). Community involvement in health systems Strengthening to improve global health outcomes: A review of guidelines and potential roles. *The International Quarterly of Community Health Education*, *37*(3–4), 139–149. SAGE Publishing. Retrieved from https://doi.org/10.1177/0272684x17738089
219. Salter, H., & Holland, R. L. (2014). Biomarkers: refining diagnosis and expediting drug development - reality, aspiration and the role of open innovation. *Journal of Internal Medicine*, *276*(3), 215–228. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/joim.12234
220. Sandvin-Olsson, A., Strøm, A., Haaland-Øverby, M., Fredriksen, K., & Stenberg, U. (2020). How can we describe impact of adult patient participation in health-service development? A scoping review. *Patient Education and Counseling*, *103*(8), 1453–1466. Retrieved from https://10.1016/j.pec.2020.02.028
221. Sangiorgi, D., Patrício, L., & Fisk, R. P. (2017). Designing for interdependence, participation and emergence in complex service systems. *Designing for Service: Key Issues and New Directions*, 49–64. Retrieved from https://doi.org/10.5040/9781474250160.ch-004
222. Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., et al. (2017). Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & Quantity*, 52(4), 1893–1907. Retrieved from https://doi.org/10.1007/s11135-017-0574-8
223. Savory, C., & Fortune, J. (2015). From translational research to open technology innovation systems. *Journal of Health Organisation and Management*, *29*(2), 200–

220. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/jhom-01-2013-0021
224. Sawatzky, R., Kwon, J.-Y., Barclay, R., Chauhan, C., Frank, L., Van Den Hout, W. B., Nielsen, L. K., et al. (2021). Implications of response shift for micro-, meso-, and macro-level healthcare decision-making using results of patient-reported outcome measures. *Quality of Life Research*, *30*(12), 3343–3357. Springer Science+Business Media. Retrieved from https://doi.org/10.1007/s11136-021-02766-9
225. Saxe, R., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., et al. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, *4*(5), 460–471. Springer Nature. Retrieved from https://doi.org/10.1038/s41562-020-0884-z
226. Scholz, R. W., & Tietje, O. (2002). Embedded case study methods: Integrating Quantitative and Qualitative Knowledge. SAGE. Retrieved from https://www.researchgate.net/profile/Roland-Scholz-3/publication/258375437_Embedded_Case_Study_Methods_Integrating_Quantitative_And_Qualitative_Knowledge/links/59784b4f0f7e9b277726e007/Embedded-Case-Study-Methods-Integrating-Quantitative-And-Qualitative-Knowledge.pdf
227. Secundo, G., Toma, A., Schiuma, G., & Passiante, G. (2018). Knowledge transfer in open innovation. *Business Process Management Journal*, *25*(1), 144–163. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/bpmj-06-2017-0173
228. Sepúlveda, J. M., & Alfaro, M. (2006). A FRAMEWORK FOR DIAGNOSIS AND EVALUATION OF KNOWLEDGE MANAGEMENT INITIATIVES. *IFAC Proceedings Volumes*. Elsevier BV. Retrieved from https://doi.org/10.3182/20060522-3-fr-2904.00030
229. Serrano-Aguilar, P., Trujillo-Martín, M., Ramos-Goñi, J., Mahtani-Chugani, V., Perestelo-Pérez, L., & Posada-de La Paz, M. (2009). Patient involvement in health research: A contribution to a systematic review on the effectiveness of treatments for degenerative ataxias. *Social Science & Medicine*, *69*(6), 920–925. Retrieved from https://10.1016/j.socscimed.2009.07.005
230. Shaikh, M., & Levina, N. (2019). Selecting an open innovation community as an alliance partner: Looking for healthy communities and ecosystems. *Research Policy*, *48*(8), 103766. Elsevier BV. Retrieved from https://doi.org/10.1016/j.respol.2019.03.011
231. Silva, P. J., Schaibley, V. M., & Ramos, K. S. (2018). Academic medical centers as innovation ecosystems to address population –omics challenges in precision medicine. *Journal of Translational Medicine*, *16*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s12967-018-1401-2
232. Smith, C. (2020). The structural vulnerability of healthcare workers during COVID-19: Observations on the social context of risk and the equitable distribution of resources. *Social Science & Medicine*, *258*, 113119. Elsevier BV. Retrieved from https://doi.org/10.1016/j.socscimed.2020.113119
233. Smolinski, M. S., Crawley, A. W., Olsen, J., Jayaraman, T., & Libel, M. (2017). Participatory Disease surveillance: engaging communities directly in reporting, monitoring, and responding to health threats. *JMIR Public Health and Surveillance*, *3*(4), e62. JMIR Publications. Retrieved from https://doi.org/10.2196/publichealth.7540
234. Sørensen, L. T. (2012). Wound Healing and Infection in Surgery. *Archives of Surgery*, *147*(4), 373. American Medical Association. Retrieved from https://doi.org/10.1001/archsurg.2012.5

235. Stein, R. A. (2017). The golden age of anti-vaccine conspiracies. *Germs*, *7*(4), 168–170. Retrieved from https://10.18683/germs.2017.1122
236. Swire-Thompson, B., & Lazer, D. (2020). Public health and online misinformation: challenges and recommendations. *Annual Review of Public Health*, *41*(1), 433–451. Annual Reviews. Retrieved from https://doi.org/10.1146/annurev-publhealth-040119-094127
237. Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, *17*(S2), 27–43. Wiley-Blackwell. Retrieved from https://doi.org/10.1002/smj.4250171105
238. Szulanski, G. (2000). The Process of Knowledge Transfer: A Diachronic Analysis of stickiness. *Organizational Behavior and Human Decision Processes*, *82*(1), 9–27. Elsevier BV. Retrieved from https://doi.org/10.1006/obhd.2000.2884
239. Szulanski, G. (2003). Sticky knowledge: Barriers to knowing in the firm. *Academy of Management Review*, *28*(4), 679. Academy of Management. Retrieved from https://doi.org/10.2307/30040760
240. Tana, S., Umniyati, S. U. Drh. S. R., Petzold, M., Kroeger, A., & Sommerfeld, J. (2012). Building and analyzing an innovative community-centered dengue-ecosystem management intervention in Yogyakarta, Indonesia. *Pathogens and Global Health*, *106*(8), 469–478. Maney Publishing. Retrieved from https://doi.org/10.1179/2047773212y.0000000062
241. Tang, P. C., & Smith, M. D. (2016). Democratization of Health Care. *JAMA*, *316*(16), 1663–1664. Retrieved from https://10.1001/jama.2016.14060
242. Tangcharoensathien, V., Calleja, N., Nguyen, T., Purnat, T., D'Agostino, M., García-Saisó, S., Landry, M., et al. (2020). Framework for Managing the COVID-19 Infodemic: Methods and results of an online, crowdsourced WHO technical consultation. *Journal of Medical Internet Research*, *22*(6), e19659. JMIR Publications. Retrieved from https://doi.org/10.2196/19659
243. Teece, D. J. (2020). Hand in Glove: Open Innovation and the Dynamic Capabilities Framework. *Strategic Management Review*, *1*(2), 233–253. Now Publishers. Retrieved from https://doi.org/10.1561/111.00000010
244. Tellis, W. (1997). Introduction to case study. *The Qualitative Report*. Nova Southeastern University. Retrieved from https://doi.org/10.46743/2160-3715/1997.2024
245. Thirup, P., & Mikkelsen, P.-S. (2000). Tacit knowledge--an epistemological framework and implications for research in doctors information needs. *PubMed*, *77*, 745–9. National Institutes of Health. Retrieved from https://pubmed.ncbi.nlm.nih.gov/11187652
246. Thompson, J., & Burke, J. (2020). Increasing Community Participation in Public Health Research: Applications for Concept Mapping Methodology. *Progress in Community Health Partnerships: Research, Education, and Action*, *14*(2), 243–250.
247. Tomaselli, G., Buttigieg, S. C., Rosano, A., Cassar, M., & Grima, G. (2020). Person-Centered Care from a relational ethics perspective for the delivery of high quality and safe healthcare: A scoping review. *Frontiers in Public Health*, *8*. Frontiers Media. Retrieved from https://doi.org/10.3389/fpubh.2020.00044
248. Tsoukas, H. (2002). Do we really understand tacit knowledge. *Handbook of Organizational Learning and Knowledge Management*, *4*, 677–690. Wiley. Retrieved from https://mba.eci.ufmg.br/downloads/dowereally.pdf

249. Tsoukas, H., & Vladimirou, E. (2001). What is Organizational Knowledge? *Journal of Management Studies*, *38*(7), 973–993. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/1467-6486.00268
250. Vahdat, S., Hamzehgardeshi, L., Hessam, S., & Hamzehgardeshi, Z. (2014). Patient Involvement in health care Decision making: a review. *Iranian Red Crescent Medical Journal*, *16*(1). Kowsar Publishing Company. Retrieved from https://doi.org/10.5812/ircmj.12454
251. Vainauskienė, V., & Vaitkienė, R. (2021). Enablers of Patient Knowledge Empowerment for Self-Management of Chronic Disease: An Integrative Review. *International Journal of Environmental Research and Public Health*, *18*(5), 2247. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/ijerph18052247
252. Vainauskienė, V., & Vaitkienė, R. (2022). Challenges To The Learning Organization In The Context Of Covid-19 Pandemic Uncertainty: Creativity-Based Response. *Creativity Studies*, *15*(2), 332–347. Vilnius Gediminas Technical University. Retrieved from https://doi.org/10.3846/cs.2022.15109
253. Vainauskienė, V., & Žemaitaitienė, G. (2023). The dynamics of knowledge sharing in chronically ill patient-led online health communities. *The International Journal of Health Planning and Management*. Retrieved from https://doi.org/10.1002/hpm.3733
254. Vaisnore, A., & Petraite, M. (2011). Customer Involvement into Open Innovation Processes: a Conceptual Model. *Social Sciences*, *73*(3). Retrieved from https://doi.org/10.5755/j01.ss.73.3.793
255. Vallentin-Holbech, L., Guldager, J. D., Dietrich, T., Rundle-Thiele, S., Majgaard, G., Lyk, P. B., & Stock, C. (2020). Co-Creating a Virtual Alcohol Prevention Simulation with Young People. *International Journal of Environmental Research and Public Health*, *17*(3), 1097. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/ijerph17031097
256. Van Bavel, J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., et al. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, *4*(5), 460–471. Springer Nature. Retrieved from https://doi.org/10.1038/s41562-020-0884-z
257. Van Den Driessen Mareeuw, F., Vaandrager, L., Klerkx, L., Naaldenberg, J., & Koelen, M. A. (2015). Beyond bridging the know-do gap: a qualitative study of systemic interaction to foster knowledge exchange in the public health sector in The Netherlands. *BMC Public Health*, *15*(1). BioMed Central. Retrieved from https://doi.org/10.1186/s12889-015-2271-7
258. Van Der Linden, S., Roozenbeek, J., & Compton, J. (2020). Inoculating against fake news about COVID-19. *Frontiers in Psychology*, *11*. Frontiers Media. Retrieved from https://doi.org/10.3389/fpsyg.2020.566790
259. Van Oerle, S., Mahr, D., & Lievens, A. (2016). Coordinating online health communities for cognitive and affective value creation. *Journal of Service Management*, *27*(4), 481–506. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/josm-09-2015-0264
260. Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Seydel, E. R., & Van De Laar, M. a F. J. (2009). Participation in online patient support groups endorses patients' empowerment. *Patient Education and Counseling*, *74*(1), 61–69. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2008.07.044
261. Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Smit, W. A., Moens, H. J. B., Siesling, S., Seydel, E. R., et al. (2009). Health-related Internet use by patients with

somatic diseases: Frequency of use and characteristics of users. *Informatics for Health & Social Care*, *34*(1), 18–29. Taylor & Francis. Retrieved from https://doi.org/10.1080/17538150902773272

262. Vanhaverbeke, W., Du, J., Leten, B., & Aalders, F. (2014). Exploring Open Innovation at the Level of R&D Projects. *Oxford University Press eBooks* (pp. 115–132). Retrieved from https://doi.org/10.1093/acprof:oso/9780199682461.003.0006
263. Veilleux, S., Noiseux, I., Lachapelle, N., Kohen, R., Vachon, L., Guay, B. W., Bitton, A., et al. (2018). Patients' perception of their involvement in shared treatment decision making: Key factors in the treatment of inflammatory bowel disease. *Patient Education and Counseling*, *101*(2), 331–339. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2017.07.028
264. Vennik, F., Adams, S., Faber, M. J., & Putters, K. (2014). Expert and experiential knowledge in the same place: Patients' experiences with online communities connecting patients and health professionals. *Patient Education and Counseling*, *95*(2), 265–270. Elsevier BV. Retrieved from https://doi.org/10.1016/j.pec.2014.02.003
265. Vindegaard, N., & Benros, M. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, Behavior, and Immunity*, *89*, 531–542.
266. Voigt, B. J. J., Novak, J., & Schwabe, G. (2007). How to manage knowledge transfer in IT - Outsourcing relationships towards a reference model. *Americas Conference on Information Systems*, 43. Retrieved from http://dblp.uni-trier.de/db/conf/amcis/amcis2007.html#VoigtNS07
267. Von Hippel, E. (2016). *Free innovation*. Cambridge, United Kingdom: Cambridge MA:MIT Press.
268. Waithaka, D., Tsofa, B., & Barasa, E. (2018). Evaluating healthcare priority setting at the meso level: A thematic review of empirical literature. *Wellcome Open Research*, *3*, 2. Wellcome. Retrieved from https://doi.org/10.12688/wellcomeopenres.13393.2
269. Wallerstein, N., & Duran, B. (2010). Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity. *American Journal of Public Health*, *100*(S1), S40–S46. American Public Health Association. Retrieved from https://doi.org/10.2105/ajph.2009.184036
270. Wanjagua, R., Hepburn, S.-J., Faragher, R., John, S. T., Gayathri, K., Gitonga, M., Meshy, C. F., et al. (2022). Key learnings fromCOVID-19 to sustain quality of life for families of individuals withIDD. *Journal of Policy and Practice in Intellectual Disabilities*, *19*(1), 72–85. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/jppi.12415
271. Wass, S., & Vimarlund, V. (2016). Healthcare in the age of open innovation – A literature review. *Health Information Management : Journal of the Health Information Management Association of Australia*, *45*(3), 121–133. SAGE Publishing. Retrieved from https://doi.org/10.1177/1833358316639458
272. Wenger, E. (1998). *Communities of Practice: Learning, meaning, and identity*.
273. Wenger, E., & Snyder, W. M. (2002). *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Retrieved from http://catalogue.cdeacf.ca/Record.htm?record=19283263124910014459

274. Wentzer, H., & Bygholm, A. (2013). Narratives of empowerment and compliance: Studies of communication in online patient support groups. *International Journal of Medical Informatics*, *82*(12), e386–e394. Elsevier BV. Retrieved from https://doi.org/10.1016/j.ijmedinf.2013.01.008
275. West, J., & Bogers, M. (2013). Leveraging External Sources of Innovation: A review of Research on Open innovation. *Journal of Product Innovation Management*, *31*(4), 814–831. Wiley-Blackwell. Retrieved from https://doi.org/10.1111/jpim.12125
276. West, J., & Gallagher, S. (2006). Challenges of open innovation: the paradox of firm investment in open-source software. *R&D Management*, *36*(3), 319–331. Retrieved from https://doi.org/10.1111/j.1467-9310.2006.00436.x
277. West, J., & Lakhani, K. R. (2008). Getting clear about communities in open innovation. *Industry and Innovation*, *15*(2), 223–231. Taylor & Francis. Retrieved from https://doi.org/10.1080/13662710802033734
278. Whelan, J., Brimblecombe, J., Christian, M., Vargas, C., Ferguson, M., McMahon, E., Lee, A., et al. (2023). CO-creation and evaluation of food environments to Advance Community Health (COACH). *AJPM Focus*, *2*(3), 100111. Elsevier BV. Retrieved from https://doi.org/10.1016/j.focus.2023.100111
279. Wiig, K. M. (1997). Knowledge Management: An Introduction and perspective. *Journal of Knowledge Management*, *1*(1), 6–14. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/13673279710800682
280. Wise, T., Zbozinek, T., Michelini, G., Hagan, C., & Mobbs, D. (2020). Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States. *Royal Society Open Science*, *7*(9), 200742.
281. Yin, R.K. (2003) Case Study Research Design and Methods. 3rd Edition, Sage, Thousand Oaks. - References - Scientific Research Publishing. (n.d.). . Retrieved from https://www.scirp.org/(S(lz5mqp453edsnp55rrgjct55))/reference/ReferencesPapers.aspx?ReferenceID=1994558
282. Yin R.K. (2014). Case Study Research Design and Methods (5th ed.). (2015). The Canadian Journal of Program Evaluation, 30(1), 108–110. https://doi.org/10.3138/cjpe.30.1.108
283. Yun, J. J., & Liu, Z. (2019). Micro- and Macro-Dynamics of Open Innovation with a Quadruple-Helix Model. *Sustainability*, *11*(12), 3301. Multidisciplinary Digital Publishing Institute. Retrieved from https://doi.org/10.3390/su11123301
284. Zhao, J., Wang, T., & Fan, X. (2015). Patient value co-creation in online health communities. *Journal of Service Management*, *26*(1), 72–96. Emerald Publishing Limited. Retrieved from https://doi.org/10.1108/josm-12-2013-0344
285. Žydžiūnaitė, V., & Sabaliauskas, S. (2017). Kokybiniai tyrimai: principai ir metodai: vadovėlis socialinių mokslų studijų programų studentams

CURRICULUM VITAE

Brigita Maženytė-Lukoševičienė
brigita.mazenyte@ktu.lt bmazenyte@gmail.com

Work experience:

2022–present	Executive Manager of the Department of Orthopaedics, Physiotherapy, Bariatrics, Neurology and Psychotherapy at NORDCLINIC (UAB "Artmedica")
2015–present	Director at DABERTA (UAB “Daberta”)
2017–2022	Assistant Professor at Lithuanian University of Health Sciences
2018–2018	Junior Researcher at Kaunas University of Technology
2017–2018	Scientific Research Assistant of the Regional Coordinator at the World Health Organization
2014–2018	Administrative Team Lead for Student Support at Lithuanian University of Health Sciences

Education:

2018–2023	Doctoral studies of Social Sciences (Management) at Kaunas University of Technology
2014–2016	Master’s degree of Public Health Management at Lithuanian University of Health Sciences
2010–2014	Bachelor’s degree of Public Health at Lithuanian University of Health Sciences

Internships:

2020.06–2020.07	Summer School MOSAIC 2020 on Management of Creativity for a Resilient Society Organized by HEC Mosaic (Montreal, Canada) and Barcelona University (Barcelona, Spain)
2019.05–2019.08	ERASMUS Exchange studies of Management, Social Sciences at Lappeenranta University of Technology, Finland
2019.06–2019.07	Summer School MOSAIC 2019 on Management of Creativity in an Innovation Society organized by HEC Mosaic (Montreal, Canada), Ryerson University (Toronto, Canada), and Barcelona University (Barcelona, Spain)
2017	ERASMUS+ Staff Mobility for Training, Darmstadt University, Germany
2016	ERASMUS+ Staff Mobility for Training, Granada University, Spain

2015	ERASMUS+ Staff Mobility for Training, Tartu University, Estonia
2012–2013	ERASMUS Exchange studies of Public Health at Malardalen University, Sweden

Scientific projects:

2019–2020	Junior researcher | Trained Machine Learning Model for Innovation Team Composition Management (MIKiMO). The project MIKiMO aims to create the machine learning model for innovation team composition management that is trained to predict the team's potential for innovation based on the intensity of knowledge and diversity.
2018–2019	Junior researcher | Creating an Open Lab for Health Innovation Communities (cHICOLab) Project by Association "Santaka Valley": the CHICo Lab project aims at designing an open lab environment for the co-creation of health solutions.

International courses, seminars:

2019	6th International Doctoral Workshop on Innovation and Entrepreneurship, Lappeenranta, Finland
2018	3rd World Congress on Nursing Education, Practice and Research, Montreal, Canada
2018	1st European Conference on Digital Exams and Assessment (ECDEA), Gothenburg, Sweden

Honours and awards:

2021.07	Awarded for the international dissemination of the research results in 2020. Issued by Kaunas University of Technology
2020.09	Scholarship for academic trip. Issued by The Research Council of Lithuania
2020.03	Scholarship for academic trip. Issued by Kaunas University of Technology
2020.01	Scholarship for study achievements. Issued by The Research Council of Lithuania
2020.01	Scholarship for study achievements. Issued by Kaunas University of Technology
2019.01	Scholarship for study achievements. Issued by The Research Council of Lithuania
2018.09	Best poster award. Issued by University of Padua

2013.01	Scholarship of the President of the Republic of Lithuania Kazys Grinius. Issued by Lithuanian University of Health Sciences

Other activities:

2020–present	Member | ISPIM (International Society for Professional Innovation Management)
2021	Reviewer | EURAM 2021 Conference organised in collaboration with UQAM- ESG (Canada, Montreal)
2021	Associated co-chair of the special track "Digital transformation in financial sector" | IEEE ICTE 2021
2017–2022	Project Coordinator | Scientific Journal "Lithuanian Obstetrics and Gynecology"
2014–2022	Evaluator of Medical Simulation Courses | Crisis Research Center, myhybridlab.com
2017–2020	Active Member | Lithuanian Junior Doctors Association

The research findings were disseminated to ensure their wide reach and impact. The theoretical and empirical results of the dissertation research were presented at national and international scientific conferences as well as published in reputable journals and books. The following section provides a comprehensive overview of these dissemination efforts.

Articles in Peer-Reviewed Scientific Publications

Indexed in the Scopus (only for HS science areas) with SNIP (Except indexed in the Web of Science with Impact Factor):

International (foreign) publishers

1. [S1; GB] **Maženytė, B.,** Petraitė, M. (2020). Mediating knowledge across health ecosystems: a qualitative field study. Measuring business excellence, 24(1), 52–68. doi:10.1108/MBE-09-2019-0099 [Emerging Sources Citation Index (Web of Science); Scopus] [CiteScore: 2,50; SNIP: 0,869; SJR: 0,341; Q2 (2020, Scopus Sources)] [FOR: M 004, S 003] [Input: 0,500]

Indexed in the Web of Science or Scopus (only for HS science areas) without Impact Factor or SNIP:

International (foreign) publishers

2. [P1a; IT] **Mazenyte, B.,** Petraite, M. (2020). Knowledge transfer in health communities: open innovation perspective. In IFKAD 2020: 15th international forum on knowledge asset dynamics "Knowledge in digital age", 9–11, September, 2020, Matera, Italy: proceedings (pp. 493–517). Matera: University of Basilicata [Conference Proceedings Citation Index - Social Science & Humanities (Web of Science)] [FOR: S 003] [Input: 0,500]
3. [P1a; ES] Kaminskienė, L., Gerulaitienė, E., Ponomarenko, T., Petraitė, M., **Maženytė, B.** (2018). New parenting learning environments. In ICERI 2018: 11th annual international conference of education, research and innovation, 12–14 November 2018, Seville, Spain: proceedings (pp. 7107–7117). Seville: IATED. [Conference Proceedings Citation Index - Social Science & Humanities (Web of Science)] [FOR: S 007, S 003] [Input: 0,200]

In other peer-reviewed scientific publications:

National (Lithuanian) publishers

4. [S3; LT] Petraitė, M., **Maženytė, B.**, Kaminskienė, L., Gerulaitienė, E., Ponomarenko, T., Nadišauskienė, R. J. (2018). Informacijos paieška prenataliniu laikotarpiu. Atvirųjų edukacinių aplinkų modelis. Lietuvos akušerija ir ginekologija = Lithuanian obstetrics & gynecology, 21(4), 266–273. [Index Copernicus] [FOR: S 003, S 007, M 001] [Input: 0,166]

In peer-reviewed conference proceedings:

International (foreign) publishers

5. [P1c; TH] **Mazenyte, B.,** Petraite, M. (2020). Communities co-creating knowledge: to improve healthcare system and public health co-evolution. In Proceedings of ISPIM conferences "Partnering for an Innovative

Community", 1–4 March 2020, Bangkok, Thailand (pp. 1–10). Bangkok: ISPIM. [Business Source Ultimate; Business Source Complete] [FOR: S 003] [Input: 0,500]

6. [P1d; IT] **Mazenyte, B.,** Petraite, M. (2019). Patient value creation in health knowledge ecosystems: evidence from a field study. In IFKAD 2019: 14th international forum on knowledge asset dynamics "Knowledge ecosystems and growth", 5–7 June 2019, Matera, Italy: proceedings (pp. 1356–1368). Matera: University of Basilicata [FOR: S 003] [Input: 0,500]
7. [P1c; GB] Petraitė, M., **Maženytė, B.**, Gerulaitienė, E., Vaitkienė, R., Užienė, L., Ponomarenko, T., Kaminskienė, L., Dobožinskas, P., Kliučinskas, M., Aukštakalnis, V., Jucevičienė, R., Budrienė, J., Nadišauskienė, R. J. (2018). Communities creating health: application of open innovation perspective. In ISPIM connects Fukuoka: building on innovation tradition, 2–5 December, 2018, Fukuoka, Japan (pp. 1–16). Manchester: ISPIM. [Business Source Ultimate; Business Source Complete] [FOR: S 003] [Input: 0,076]

Study and Teaching Publications and Parts Thereof

Educational books:

8. [K2b; LT] Надишаускене, Р. Й., Кудрявичене, А., Барилене, С., Малакаускене, Л., **Мажените, Б.,** Андреяйте, Е. (2020). ОСКЭ. Принципы организации: учебное пособие. Каунас: Издательство «LSMU Leidybos namai». [FOR: M 001] [Input: 0,166] [Input in auth. quires: 0,605] [Document auth. quires: 3,643]

Presentation of Research Results at Conferences

Other conference presentation abstracts and non-peer reviewed conference papers:

9. [T2; LT] Sermontytė-Baniulė, R., **Maženytė, B.**, Marcinkevičius, G., Pundzienė, A. (2020). Categorization of digital health unicorn platforms: position in the value chain and platform openness. In 1st KEEN forum PhD colloquium: artificiality and sustainability in entrepreneurship, 20 August, 2020, Kaunas, Lithuania: conference proceedings (pp. 42–45). Kaunas: Technologija [FOR: S 003]
10. [T3; AT] Malakauskiene, L., Ulevicius, J., **Mazenyte, B.,** Nadisauskiene, R. J., Kudreviciene, A. (2019). Medical students' peer to peer assessment reliability in clinical case simulations training. In An International Association for Medical Education (AMEE 2019) annual conference: abstract book: 24th to 28th August 2019, Vienna, Austria (pp. 665–665) [FOR: M 001]
11. [T2; LV; OA] **Maženytė, B.,** Petraitė, M. (2019). Innovative knowledge creation of health issues in a level of holistic community. In Knowledge for use in practice: international conference on medical and health care sciences,

1–3 April, 2019, Rīga, Latvia: abstracts (pp. 460–460). Rīga: Rīga Stradiņš University [FOR: M 004, S 003]

12. [T3; GB] Petraitė, M., Užienė, L., **Maženytė, B.** (2018). Knowledge management model for communities creating health: a systemic perspective. Presented at the 19th European conference on knowledge management: (ECKM 2018), 6–7 September 2018, University of Padua, Italy: abstracts of papers (pp. 147–148). Reading: Academic Conferences and Publishing International [FOR: S 003]

Research Conferences

1. **ISPIM connects Fukuoka**: building on innovation tradition. Oral presentation title: "Communities creating health: application of open innovation perspective", 02–05 December, 2018, Fukuoka, Japan.
2. **RSU: International Conference on Medical and Health Care Sciences "Knowledge for Use in Practice"**. Poster presentation title: "Innovative Knowledge Creation of Health Issues in Level of Holistic Community", 01–03 April 2019, Riga, Latvia.
3. **IFKAD 2019: 14th international forum on knowledge asset dynamics "Knowledge ecosystems and growth"**. Oral presentation title: "Patient value creation in health knowledge ecosystems: evidence from a field study" 05–07 June, 2019, Matera, Italy.
4. **Doctoral Colloquium as a part of the 6th AIB-CEE Chapter Annual Conference "International Business in the Dynamic Environment: Changes in Digitalization, Innovation and Entrepreneurship".** Oral presentation title: "Knowledge creation in healthcare ecosystems: a systematic literature review" September 25, 2019. Kaunas, Lithuania.
5. **ISPIM connects Bangkok: Partnering for an Innovative Community**. Oral presentation title: "Communities co-creating knowledge: healthcare system and public health co-evolution", 01–04 March 2020, Bangkok, Thailand.
6. **IFKAD 2020: 14th international forum on knowledge asset dynamics "Knowledge in Digital Age"**. Oral presentation title: "Knowledge Transfer in Health Communities: Open Innovation Perspective", 09–11 September, 2020, Matera, Italy.
7. **EURAM 2021: "Reshaping capitalism for a sustainable world"**. Oral presentation title: "Knowledge transfer in digital and direct health communities: a systematic literature review", 16–18 June, 2021, Online Conference organized in collaboration with UQAM-ESG (Canada, Montreal).

The dissertation was developed during research internships and projects

1. Junior researcher in the institutional research project "Health innovation development in holistic communities: creating open educational environments for knowledge integration" supported by the Association of "Santaka Valley" (KTU), supervisors: Prof. Dr. Monika Petraitė (KTU), Prof. Dr. Ruta Nadišauskienė (LSMU), Prof. Dr. Lina Kaminskienė (VDU), March–December, 2018.

2. Junior researcher in the institutional research project "Trained Machine Learning Model for Innovation Team Composition Management (MIKiMO) Trained Machine Learning Model for Innovation Team Composition Management (MIKiMO)" supported by the Research Council of Lithuania, supervisor: Dr. Vytautė Dluguborskytė (KTU), February 2019–January 2020.

3. Erasmus long-term research internship at Lappeenranta University of Technology, Lappeenranta (Finland), supervisor: Prof. Dr. Daria Podmetina, May–August, 2019.

4. Summer school at MOSAIC 2019. Summer School on Management of Creativity in an Innovation Society organized by HEC Mosaic (Montreal, Canada), Ryerson University (Toronto, Canada), and Barcelona University (Barcelona, Spain), June 27–July 13, 2019.

5. Summer school at MOSAIC 2020. Summer School on Management of Creativity for a Resilient Society Organized by HEC Mosaic (Montreal, Canada) and Barcelona University (Barcelona, Spain), June 29–July 10, 2020.

6. International course at Copenhagen Business School. Qualitative Research Methods held at Copenhagen Business School (Denmark), 3–6 November, 2020.

7. Reviewer at EURAM 2021. A reviewer for the annual EURAM 2021 Online Conference organised in collaboration with UQAM- ESG (Canada, Montreal). The conference theme is "Reshaping capitalism for a sustainable world", 16–18 June, 2021.

8. Associated co-chair of the special track at IEEE ICTE 2021. IEEE ICTE 2021 International Conference on Technology and Entrepreneurship: Leading Digital Transformation in Business and Society "Digital transformation in financial sector", August, 2021, Kaunas, Lithuania.

The theoretical and empirical research was carried out at Kaunas University of Technology (Kaunas, Lithuania) (2018–2023), Lithuanian University of Health Sciences (Kaunas, Lithuania) (2018–2022), Copenhagen Business School (Copenhagen, Denmark) (2020), HEC Mosaic (Montreal, Canada), Ryerson University (Toronto, Canada), Barcelona University (Barcelona, Spain) (2019), Lappeenranta University of Technology (Lappeenranta, Finland) (2019).

Modules completed during PhD studies

CODE	TOPIC	GRADE	CREDITS
S189D001	Contemporary Management Theories and Concepts	10	9 ECTS
S189D010	Designing a PhD Research Project	10	9 ECTS
T180D001	Innovations and Global Knowledge Economy	10	6 ECTS
XXXXD007	Qualitative Research Methods	IT	5 ECTS
XXXXD089	Innovation and Entrepreneurship	IT	2 ECTS
XXXXD094	Management of Creativity in an Innovation Society	IT	7.5 ECTS
		Sum:	**38.5 ECTS**

ACKNOWLEDGMENTS

During my doctoral studies, I had the gift of exploring the topic of my professional background. The topic was born during a united project of three Lithuanian Universities (LSMU-KTU-VDU), and this thesis is a continuation of the work after the short-term project was done.

“If I have seen further, it is by standing on the shoulders of Giants” (Isaac Newton).

I am honoured to have had the privilege of working with Prof. Dr. Monika Petraitė as my dissertation supervisor, and I am grateful for her guidance and support. I am truly grateful for Prof. Dr. Monika Petraitė's insightful feedback, constructive criticism, and constant motivation that challenged me to explore new perspectives and push the boundaries of my academic capabilities. I would like to extend my appreciation for her belief in my potential and commitment to helping me achieve the academic goals.

Next, I would like to dedicate this dissertation to the late Prof. Dr. Rūta Jolanta Nadišauskienė, whose guidance and expertise greatly influenced the development and completion of this research. Prof. Dr. Rūta Jolanta Nadišauskienė played a crucial role as my first teacher of the academic world, as an inspiring consultant, providing valuable insights, feedback, and support throughout the dissertation process. Her commitment to academic excellence and her passion for research were truly inspiring. Rest in peace Prof. Dr. Rūta Jolanta Nadišauskiene. Your guidance and influence will be forever remembered and appreciated.

I am deeply indebted to Kaunas University of Technology for the opportunities, resources, and support that have shaped my academic journey and contributed to the successful completion of this dissertation. I would like to express my appreciation to Prof. Dr. Asta Pundzienė, Prof. Dr. Robertas Jucevičius, Prof. Dr. Lina Dagilienė, Prof. Dr. Rimgailė Vaitkienė, Assoc. Prof. Dr. Vestina Vainauskienė, and other academic personnel. Moreover, I thank fellow doctoral students who have enriched my academic experience with their collaboration and intellectual discussions. The sense of community and shared pursuit of knowledge at Kaunas University of Technology has made my time here truly memorable and rewarding.

I am as well very fortunate to have worked with Lithuanian University of Health Sciences, and I am grateful for the collaboration, cooperation, and willingness to share knowledge and professional insights. The contribution of Lithuanian University of Health Sciences and colleagues from this university has enhanced the validity and reliability of this research and enriched my understanding of the subject matter.

I would like to thank other international level scientists with whom discussions were important in the individual stages of the dissertation preparation, whom I met during the internships in Canada, Finland, Denmark, and international conferences held abroad.

I as well extend my thankfulness to the participants of this study. Their willingness to generously share their time, insights, and experiences has been invaluable in shaping the outcomes of this research.

I would like to express my heartfelt gratitude and appreciation to my family and friends who have been unwavering in their support throughout my dissertation journey. I thank my parents Jolita Maženienė and Robertas Maženis for their unconditional love and belief in me and my grandfather Vaclovas Poska who is an extraordinary example how to remain a human in every single life situation. I thank my brother Darius Maženis and his family for unwavering support that has been a constant reminder of the importance of family and the strength that comes from their presence. A very special gratitude goes to my husband Martynas Lukoševičius for the words of encouragement, celebration of my milestones, and understanding during certain moments, limitless support, all of which mean the world to me since the beginning. Moreover, I am thankful to my family-in-law and other family members whose support in everyday cases were encouraging to take another step further.

I extend my sincere appreciation to my close friends and colleagues, thanking for standing by my side throughout this journey. I am grateful for the countless conversations, laughter, and moments of respite that we shared during this challenging time.

Thank you from the bottom of my heart for being there for me every step of the way.

Brigita Maženytė-Lukoševičienė,
Kaunas 2024

Appendix 1. Interview Guideline for Researcher

	Klausimų navigacija
Pildo tyrėjas	*Koks yra Jūsų amžius? ____* *Kokiai sveikatos bendruomenei priklausote? (pavadinimas)* *_____* *Trumpai papasakot apie sveikatos benduromenę, kurioje dalyvauijate*
Įvadinis lygmuo	*Papasakokite apie bendruomenės aktyvumą* *Papasakokite apie narystę bendruomenėje: kiek yra aktyvių narių ? Ar yra galimybė prisijungti į bendruomenę visiems, kas tik pageidauja?Ar bendruomenėje dalyvauja sveikatos priežiūros profesionalai?* *Ar dalyvauja ir bendruomenėje nedalyvaujantys aktoriai – verslo, mokslo subjektai, kitos bendruomenės, visuomenininkai ar privatūs asmenys?* *Kodėl Jums svarbu dalyvauti šioje sveikatos bendruomenėje?* *Ko išmokstate naujo dalyvaudami sveikatos bendruomenėje išmokstate?* *Kokie pagrindiniai klausimai Jums kyla? Kokios informacijos Jums labiausiai trūksta?* *Kur ieškote informacijos? Šaltiniai?* *Ar dalyvaujate virtualiose bendruomenių grupėse? (arba "gyvose" bendruomenėse?)*
Antras lygmuo	*Kaip jaučiate – ar daugiau turimų žinių atiduodate – ar gaunate?* *Kaip manote, kokia nauda yra sveikatos bendruomenei, kai jos nariai dalinasi turima informacija bei žiniomis?* *Kaip manote, ar žinių prieinamumas ir galimybė jomis dalintis pakeičia paciento žinias apie sveikatos klausimą?Kaip?* *Ar kiti bendruomenės nariai Jums kelia pasitikėjimą?* *Ar dalijatės savo sveikatos problemomis/žiniomis bendruomenėje?* *Ar yra aiškus žinių dalijimosi procesas bendruomenėje?* *Kuo pasitikite priimat sveikatos sprendimus?*
Trečias lygmuo	*Ar žinote kaip tiksliai yra perduodamos žinios kitoms sveikatos bendruomenėms? Visuomenei?Kokios žinios?* *Kokios žinios jums atrodo naudingiausios sprendžiant sveikatos klausimus?* *Ko trūksta sklandesniam žinių dalijimosi procesui ?* *Ar yra procesas standartizuotas?*
Ketvirtas lygmuo	*Kaip manote, kaip Jūsų sveikatos bendruomenės kūriniai padeda sveikatos gerinimui?* *Kaip manote, kaip sklandesnis žinių perdavimas sveikatos bendruomenės viduje galėtų prisidėti prie efektyvesnio inovacijų kūrimo ?* *Ko trūksta sklandesniam žinių dalijimosi procesui bendraujant?* *Kas galėtų padėti organizuoti bendruomenę ir bendrai kuriamas žinias?*

Appendix 2. Articles related to chosen the topics in details

PubMed

	Article	Keywords	Year	Journal	1st order category	2nd order category	3rd order category
KNOWLEDGE MANAGEMENT AND HEALTH ECOSYSTEM							
1.	Klucken, J., Krüger, R., Schmidt, P., & Bloem, B.R. (2018). Management of Parkinson's Disease 20 Years from Now: Towards Digital Health Pathways. Journal of Parkinson's disease, 8(s1), S85–S94. https://doi.org/10.3233/JPD-181519	Parkinson's Disease, Management, Treatment, Digital Pathways, Innovation, Healthcare	2018	Journal of Parkinson's Disease IF: 1,702	Disease Management; Digital Health	Innovation	Health Community
2.	Laihonen, H. (2012). Knowledge structures of a health ecosystem, Journal of Health Organization and Management, Vol. 26 No. 4, pp. 542–558. https://doi.org/10.1108/14777261211251571	Health Ecosystem, Knowledge Flows, Complexity, Health Care Management, Finland, Health Services Sector, Knowledge Transfer, Complexity Theory	2012	Journal of Health Organization and Management IF: 1,306	Ecosystems	Knowledge Management	Knowledge Transfer
3.	Chaut, T. et al. (2013). Knowledge Translation in Rehabilitation Engineering Research and Development: A Knowledge Ecosystem Framework. Archives of Physical Medicine and Rehabilitation. DOI: 10.1016/j.apmr.2012.07.032	Activities of Daily Living, Knowledge, Occupational Therapy, Rehabilitation, Self-Help Devices, Technology Transfer	2013	Archives of Physical Medicine and Rehabilitation IF: 2.441	Ecosystems	Knowledge Management	Knowledge Transfer
4.	Tana, S., Umniyati, S., Petzold, M., Kroeger, A., & Sommerfeld, J. (2012). Building and analyzing an innovative community-centered dengue-ecosystem management intervention in Yogyakarta, Indonesia. Pathogens and global health, 106(8), 469–478. https://doi.org/10.1179/2047773212Y.0000000062	Dengue, Community Participation, Empowerment, Waste Management	2012	Pathogens and Global Health IF: 1.969	Community Empowerment	Innovation	Health Community
OPEN INNOVATION AND HEALTH							
	Silva, P.J., Schaibley, V.M., & Ramos, K.S. (2018). Academic medical centers as innovation ecosystems to address population -omics challenges in precision medicine. Journal of translational medicine, 16(1), 28. https://doi.org/10.1186/s12967-018-1401-2	Precision Medicine, Genomics, Biomarker Collaboration, Open Innovation, Diagnostic Technology, Technology Transfer, Licensing, Industry Alliance, Data Ecosystem	2018	Journal of Translational Medicine IF: 4.197	Precision Medicine	Health Ecosystems	Knowledge Transfer
	Hill, A., Loh, P.R., Bharadwaj, R.B., Pons, P., Shang, J., Guinan, E., Lakhani, K., Kilty, I., & Jelinsky, S.A. (2017). Stepwise Distributed Open Innovation Contests for Software Development: Acceleration of Genome-Wide Association	Open Innovation, Crowdsourcing, Genome-Wide Association Study, PLINK, Logistic Regression	2017	GigaScience IF: 4.688	Software Development	Open Innovation	Knowledge Transfer

	Analysis. GigaScience, 6(5), 1–10. https://doi.org/10.1093/gigascience/gix009						
	Wass, S., & Vimarlund, V. (2016). Healthcare in the age of open innovation – A literature review. Health Information Management Journal, 45(3), 121–133. https://doi.org/10.1177/1833358316639458	Diffusion of Innovation, Health InformationExchange,Informatics, Revi ew Literature as Topic	2016	Health Information Management Journal IF: 1.742	Diffusion of Innovation	Knowledge Management	Knowledge Transfer
	Melvin Reichman, Peter B. Simpson, Open innovation in early drug discovery: roadmaps and roadblocks, Drug Discovery Today, Volume 21, Issue 5, 2016, Pages 779–788, ISSN 1359-6446. https://doi.org/10.1016/j.drudis.2015.12.008.	N/D	2015	Drug Discovery Today IF: 6.369	Drug Management; Open Innovation	Open Innovation	Knowledge Transfer
	* Hanna Hopia, Mari Punna, Teemu Laitinen, Eila Latvala, A patient as a self-manager of their personal data on health and disease with new technology – challenges for nursing education, Nurse Education Today, Volume 35, Issue 12,2015, Pages e1–e3, ISSN 0260-6917. https://doi.org/10.1016/j.nedt.2015.08.017.	N/D	2015	Nurse Education Today IF: 2.442	Patient Empowerment	Knowledge Management	Knowledge Transfer
	Minna Allarakhia (2015). Exploring open innovation with a patient focus in drug discovery: an evolving paradigm of patient engagement, Expert Opinion on Drug Discovery, 10:6, 571–578. DOI: 10.1517/17460441.2015.1037271.	Lead Patient, Open Innovation, Patient Centricity, Patient Engagement	2015	Expert Opinion on Drug Discovery IF: 4.421 (2018 m.)	Patient Empowerment	Open Innovation	Knowledge Transfer
	Salter, H, Holland, R (Science for Life Laboratory, Solna; Karolinska Insitutet, Solna, Sweden; and Oxford Gene Technology, Yarnton, Oxford, UK). Biomarkers: refining diagnosis and expediting drug development – reality, aspiration and the role of open innovation (Review). J Intern Med 2014; 276: 215–228. doi: 10.1111/joim.12234	Biomarkers, Companion Diagnostics, Genomics, Personalized Medicine	2014	Journal of Internal Medicine IF: 6.051	Disease Management; Open Innovation	Open Innovation	Knowledge Transfer
	Dandonoli, P. Open innovation as a new paradigm for global collaborations in health. Global Health 9, 41 (2013). https://doi.org/10.1186/1744-8603-9-41	Partnerships, Innovation, Global Health, Maternal, Newborn, Child, Maker Movement, Open Innovation, Disruptive Innovation, Frugal Innovation	2013	Globalization and Health IF: 3.406	Maternal Health	Open Innovation	Health Community
	Angelika C. Bullinger, Matthias Rass, Sabrina Adamczyk, Kathrin M. Moeslein, Stefan Sohn, Open innovation in health care: Analysis of an open health	Open Innovation, Public Integration, Health Care Communication	2012	Health Policy IF:2.293	Health Platforms	Open Innovation	Knowledge Transfer

	platform, Health Policy, Volume 105, Issues 2–3, 2012, Pages 165–175, ISSN 0168-8510. https://doi.org/10.1016/j.healthpol.2012.02.009.						
KNOWLEDGE CO-CREATION AND COMMUNITY							
	Emma Haynes, Minitja Marawili, Brendan Makungun Marika, Alice G. Mitchell, Jodi Phillips, Dawn Bessarab, Roz Walker, Jeff Cook, Anna P. Ralph, Community-based participatory action research on rheumatic heart disease in an Australian Aboriginal homeland: Evaluation of the 'On track watch' project, Evaluation and Program Planning, Volume 74, 2019, Pages 38–53, ISSN 0149-7189, https://doi.org/10.1016/j.evalprogplan.2019.02.010.	Aboriginal Health Inequity, Australian Aboriginal, Co-Design, Community-Based Participatory Action Research, Empowerment, Health Systems, Indigenous, Knowledge Exchange, Reciprocal Knowledge Co-Creation, Rheumatic Heart Disease	2019	Evaluation and Program Planning IF: 1.240	CommunityManagement	Health Management	Health Community
	Precision Medicine Goes Global: How to Get It Right? Four Ways to Mobilize Scientific Knowledge Vural Özdemir OMICS: A Journal of Integrative Biology 2018 22:8, 539–543https://doi.org/10.1089/omi.2018.0104	Innovation Governance, Knowledge Mobilization, Precision Medicine, Responsible Innovation, Technology and Society	2018	OMICS (Journal) IF: 2.370	Precision Medicine	Knowledge Management	Knowledge Transfer
	*Amann, J., & Rubinelli, S. (2017). Views of Community Managers on Knowledge Co-creation in Online Communities for People With Disabilities: Qualitative Study. Journal of medical Internet research, 19(10), e320. https://doi.org/10.2196/jmir.7406	Co-Creation, Community Networks, Community Participation, Internet, Patient-Centered Care, Telemedicine	2017	Journal of Medical Internet Research IF: 4.945	Community Management; Online Communities; Co-Creation	Co-Creation	Health Community
	van den Driessen Mareeuw, F., Vaandrager, L., Klerkx, L., Naaldenberg, J., & Koelen, M. (2015). Beyond bridging the know-do gap: a qualitative study of systemic interaction to foster knowledge exchange in the public health sector in The Netherlands. BMC public health, 15, 922. https://doi.org/10.1186/s12889-015-2271-7	Public Health, Health Promotion, Innovation System, Know-Do Gap, Implementation, Knowledge Exchange, Stakeholders	2015	BMC Public Health IF: 2.567	Know-Do; Health Ecosystem	Knowledge Management	Knowledge Transfer
	*Kitson, A., Powell, K., Hoon, E., Newbury, J., Wilson, A., & Beilby, J. (2013). Knowledge translation within a population health study: how do you do it?. Implementation science : IS, 8, 54. https://doi.org/10.1186/1748-5908-8-54	Knowledge Translation, Population Health, Engaged Scholarship, Co-KT Framework, Health System Redesign	2013	Implementation Science IF: 4.525	Knowledge Management	Knowledge Translation	Health Community
KNOWLEDGE TRANSFER AND OPEN INNOVATION							

	Savory, C. and Fortune, J. (2015), "From translational research to open technology innovation systems", Journal of Health Organization and Management, Vol. 29 No. 2, pp. 200–220. https://doi.org/10.1108/JHOM-01-2013-0021	Healthcare Technology, Mode 2 Knowledge Production, Open Innovation, Patientrack, Quadruple-Helix, Translational Research, User Driven Innovation	2015	Journal of Health Organization and Management IF: 1,306	Difussion of Innovation	Open Innovation	Knowledge Transfer
	Melder, A., Burns, P., Mcloughlin, I., & Teede, H. (2018). Examining 'institutional entrepreneurship' in healthcare redesign and improvement through comparative case study research: a study protocol. BMJ open, 8(8), e020807. https://doi.org/10.1136/bmjopen-2017-020807	Diffusion of Innovation, Entrepreneurship, Health Services Research, Knowledge Translation, Organizational Innovation, Qualitative Research	2018	BMJ Open IF: 2.376	Entrepreneurship, Difussion of Innovation	Knowledge Translation	Knowledge Transfer
	*Hanna Hopia, Mari Punna, Teemu Laitinen, Eila Latvala, A patient as a self-manager of their personal data on health and disease with new technology – challenges for nursing education, Nurse Education Today, Volume 35, Issue 12, 2015, Pages e1–e3, ISSN 0260-6917, https://doi.org/10.1016/j.nedt.2015.08.017	N/D	2015	Nurse Education Today IF: 2.442	Patient Empowerment	Knowledge Management	Health Community
	*McKibbon, K. A., Lokker, C., Keepanasseril, A., Colquhoun, H., Haynes, R. B., & Wilczynski, N. L. (2013). WhatisKT wiki: a case study of a platform for knowledge translation terms and definitions-descriptive analysis. Implementation science : IS, 8, 13. https://doi.org/10.1186/1748-5908-8-13	Diffusion Of Innovations, Research, Knowledge Translation, Implementation Science	2013	Implementation Science IF: 4.525	Knowledge Management; Difussion of Innovation	Knowledge Translation	Knowledge Transfer

*Article found in more than one category of results

WoS

	Article	**Keywords**	**Year**	**Journal**	**1st order category**	**2nd order category**	**3rd order category**
KNOWLEDGE MANAGEMENT AND HEALTH ECOSYSTEM							
	Cori, L., Bianchi, F., Sprovieri, M., Cuttitta, A., Ruggieri, S., Alessi, A. L., Gorini, F. (2019). Communication and Community Involvement to Support Risk Governance. International Journal of Environmental Research and Public Health, 16(22), 4356. https://doi.org/10.3390/ijerph16224356	Environment and Health, High Risk Areas, Contaminated Sites, Risk Governance, Human Biomonitoring, Environmental Monitoring, Risk Communication, Training and Education	2019	International Journal of Environmental Research and Public Health IF: 2.468	Community Health	Health Management	Health Community
	Menear, M., Blanchette, M.-A., Demers-Payette, O., & Roy, D. (2019). A framework for value-creating learning health systems. Health Research Policy and	Learning Health Systems, Framework, Quality Improvement, Health System	2019	Health Research Policy and Systems IF 2.218	Health Systems	Value Creation	Health Community

	Systems, 17(1), 79. https://doi.org/10.1186/s12961-019-0477-3	Performance, Value-Based Care, Canada					
	Floch J, Zettl A, Fricke L, Weisser T, Grut L, Vilarinho T, Stav E, Ascolese A, Schauber C. User Needs in the Development of a Health App Ecosystem for Self-Management of Cystic Fibrosis: User-Centered Development Approach JMIR Mhealth Uhealth 2018;6(5):e113 DOI: 10.2196/mhealth.8236	Self-Management, Cystic Fibrosis, Mobile Health, User Centered Design	2018	JMIR Mhealth and Uhealth IF 4.301	Patient Empowerment	Health Management	Health Community
	Identifying the social and environmental determinants of plague endemicity in Peru: insights from a case study in Ascope, La Libertad Rivière-Cinnamond et al. BMC Public Health (2018) 18:220 DOI 10.1186/s12889-018-5062-0	Plague, Social and Environmental Determinants of Health, Qualitative Methods, Risk Perceptions, Complex Systems, Public Health Policy	2018	BMC Public Health IF 2.567	Health Systems	Health Management	Health Community
	Healthcare model with use of information and communication technology for patients with chronic disease By:Lisiecka-Bielanowicz, M et al. Annals of Agricultural and Environmental Medicine 2016, Vol 23, No 3, 462–467 www.aaem.pl	Healthcare System, Chronic Disease, Organizational Model, Health Information Management, ICT Systems	2016	Annals of Agricultural and Environmental Medicine IF 1.03	Disease Management; Health Systems	Knowledge Management	Knowledge Transfer
	Mary Ruckelshaus, Emily McKenzie, Heather Tallis, Anne Guerry, Gretchen Daily, Peter Kareiva, Stephen Polasky, Taylor Ricketts, Nirmal Bhagabati, Spencer A. Wood, Joanna Bernhardt, Notes from the field: Lessons learned from using ecosystem service approaches to inform real-world decisions, Ecological Economics, Volume 115, 2015, Pages 11–21, ISSN 0921-8009, https://doi.org/10.1016/j.ecolecon.2013.07.009.	Ecosystem Services, Human Development and Conservation, Spatial Planning, PES, Decision Support	2015	Ecological Economics IF 4.281	Ecosystems	Knowledge Management	Knowledge Transfer
	Hsieh, H.-L., Lin, H.-J., Shih, S.-S., & Chen, C.-P. (2015). Ecosystem Functions Connecting Contributions from Ecosystem Services to Human Wellbeing in a Mangrove System in Northern Taiwan. International Journal of Environmental Research and Public Health, 12(6), 6542–6560. https://doi.org/10.3390/ijerph120606542	Mangrove Ecosystem, Ecosystem Functions, Ecosystem Services, Human Wellbeing, Component Connection Network	2015	International Journal of Environmental Research and Public Health IF 2.468	Health Services	Health Ecosystem	Health Community
	Managing Interoperability and Complexity in Health Systems By: Bouamrane, MM et al. DOI: 10.3414/ME15-10-0001	Medical Informatics, Health Information Management, Knowledge Bases, Biological Ontologies, Systematized Nomenclature of Medicine, Information	2015	Methods Inf Med IF 1.024	Health Systems	Health Management	Knowledge Transfer

		Storage and Retrieval, Classification, Systems Integration					
	Perspectives to Performance of Environment and Health Assessments and Models-From Outputs to Outcomes? By: Pohjola, MV et al. Int. J. Environ. Res. Public Health 2013, 10, 2621–2642; doi:10.3390/ijerph10072621	Assessment, Model, Evaluation, Environment, Health, Performance, Management, Quality, Uncertainty, Effectiveness	2013	International Journal of Environmental Research and Public Health IF 2.468	Environment Health	Health Management	Health Community
	The role of social networks in the governance of health systems: the case of eye care systems in Ghana By: Blanchet, K Health Policy and Planning 2013;28:143–156 doi:10.1093/heapol/czs031	Social Networks, Health Systems, Ophthalmology, Health Services, Management	2013	Health Policy and Planning IF 2.717	Health Systems	Health Management	Health Community
	Susilowati Tana, SittiRahmah Umniyati, Max Petzold, Axel Kroeger & Johannes Sommerfeld (2012) Building and analyzing an innovative community-centered dengue-ecosystem management intervention in Yogyakarta, Indonesia, Pathogens and Global Health, 106:8, 469–478, DOI: 10.1179/2047773212Y.0000000062	Dengue, Community Participation, Empowerment, Waste Management	2012	Pathogens and Global Health IF 1.969	Community Empowerment	Health Management	Health Community
	Critical Issues in the Development of Health Information Systems in Supporting Environmental Health: A Case Study of Ciguatera By:Goater, S https://ehp.niehs.nih.gov/doi/10.1289/ehp.1002575 https://doi.org/10.1289/ehp.1002575	Ciguatera, Climate Change, Ecosystem Health, Environmental Health, Health Information Systems	2011	Environmental Health Perspectives IF 7.736	Ecosystems	Health Ecosystem	Health Community
OPEN INNOVATION AND HEALTH							
	Maha Shaikh, Natalia Levina, Selecting an open innovation community as an alliance partner: Looking for healthy communities and ecosystems, Research Policy, Volume 48, Issue 8, 2019, 103766, ISSN 0048-7333, https://doi.org/10.1016/j.respol.2019.03.011.	Strategic Alliances, Partner Selection, Open Source Community, Open Innovation, Open Ecosystem, Company Engagement with Open Source, Company-Community Relationship	2019	Research Policy IF 5.425	Ecosystems	Open Innovation	Health Community
	Hussey, P et al. 2019 Building infrastructure for digital health using Open innovation 2.0 in co design of a meta data registry framework to support integrated care.. International Journal of Integrated Care,	Digital Health, Interoperability, Data Dictionary, Co Design, Innovation	2019	International Journal of Integrated Care IF 2.489	Digital Health	Open Innovation	Knowledge Transfer

	19(S1): A18, pp. 1–8, DOI: dx.doi.org/10.5334/ijic.s3018						
	Nambisan, S, Siegel, D, Kenney, M. On open innovation, platforms, and entrepreneurship. Strategic Entrepreneurship Journal. 2018; 12: 354– 368. https://doi.org/10.1002/sej.1300	Ecosystems, Entrepreneurship, Open Innovation, Platforms	2018	Strategic Entrepreneurship Journal IF 2.956	Ecosystems	Open Innovation	Knowledge Transfer
	S. Fernandes, M. Cesário, J.M. Barata, Ways to open innovation: Main agents and sources in the Portuguese case, Technology in Society, Volume 51, 2017, Pages 153–162,ISSN 0160-791X, https://doi.org/10.1016/j.techsoc.2017.09.002.	Open Innovation, Cooperation, Agents, Sources, Scope, Scale	2017	Technology in Society IF 1.67	Community Health	Open Innovation	Knowledge Transfer
	*Wass, S., & Vimarlund, V. (2016). Healthcare in the age of open innovation – A literature review. Health Information Management Journal, 45(3), 121–133. https://doi.org/10.1177/1833358316639458	Diffusion of Innovation, Health Information Exchange, Informatics, Review Literature as Topic	2016	Health Information Management Journal IF 1.742	Diffusion of Innovation	Open Innovation	Knowledge Transfer
	Jeffrey R. Davis, Elizabeth E. Richard & Kathryn E. Keeton (2015) Open Innovation at NASA: A New Business Model for Advancing Human Health and Performance Innovations, Research-Technology Management, 58:3, 52–58, DOI: 10.5437/08956308X5803325	Culture Change, Business-Model Innovation, Open Innovation, Crowdsourcing	2015	Research-Technology Management IF 1.407	Business-Model Transformation	Open Innovation	Knowledge Transfer
	Henrike, Hannemann-Weber; Schultz, Carsten. The impact of health care professionals' service orientation on patients' innovative behavior, Health Care Management Review: October/December 2014 - Volume 39 - Issue 4 - p 329–339 doi: 10.1097/HMR.0b013e31829d534c	Idea Generation, Patient Innovative Behavior, Rare Diseases, Service Orientation, Shared Goals, Work Adaptivity and Proactivity	2014	Health Care Management Review IF 2.636	Disease Management	Innovation	Health Community
	Using users: When does external knowledge enhance corporate product innovation? By:Chatterji, AK et al https://onlinelibrary.wiley.com/doi/full/10.1002/smj.2168. https://onlinelibrary.wiley.com/doi/full/10.1002/smj.2168 https://doi.org/10.1002/smj.2168	Innovation Strategy, Knowledge Sourcing, Open Innovation, Health Care Strategy, Intellectual Property Strategy	2014	Strategic Management Journal IF 5.572	Knowledge Management	Open Innovation	Knowledge Transfer
	Programmes and calls for public health research in European countries By:Conceicao, C doi:10.1093/eurpub/ckt152	N/D	2013	European Journal of Public Health IF 2.234	Public Health	Health Management	Knowledge Transfer

	*Dandonoli, P. (2013). Open innovation as a new paradigm for global collaborations in health. Globalization and Health, 9(1), 41. https://doi.org/10.1186/1744-8603-9-41	Partnerships, Innovation, Global Health, Maternal, Newborn, Child, Maker Movement, Open Innovation, Disruptive Innovation, Frugal Innovation	2013	Globalization and Health IF 2.554	Dffusion of Innovation	Open Innovation	Knowledge Transfer
	*Angelika C. Bullinger, Matthias Rass, Sabrina Adamczyk, Kathrin M. Moeslein, Stefan Sohn,Open innovation in health care: Analysis of an open health platform,Health Policy,Volume 105, Issues 2–3,2012, Pages 165–175,ISSN 0168-8510, https://doi.org/10.1016/j.healthpol.2012.02.009	Open Innovation, Public Integration, Health Care, Communication	2012	Health Policy IF 2.075	Public Health	Open Innovation	Knowledge Transfer
KNOWLEDGE CO-CREATION AND COMMUNITY							
	Tomaselli G, Buttigieg SC, Rosano A, Cassar M and Grima G (2020) Person-Centered Care From a Relational Ethics Perspective for the Delivery of High Quality and Safe Healthcare: A Scoping Review. Front. Public Health 8:44. doi: 10.3389/fpubh.2020.00044	Person-Centered Care (PCC), Patient-Centered Care, Ethics, Relational Ethics, Patient Safety, Quality of Care, Health Systems	2020	Frontiers in Public Health IF 2.031	Patient-Centered Care; Health Systems	Health Management	Health Community
	Co-Creating a Virtual Alcohol Prevention Simulation with Young People By:Vallentin-Holbech, L et al. Int. J. Environ. Res. Public Health 2020, 17, 1097; doi:10.3390/ijerph17031097	Living Lab Methodology, Co-Creation, Participatory Research, Empowerment, Self-Efficacy, Alcohol Prevention	2020	International Journal of Environmental Research and Public Health IF 2.468	Patient Empowerment	Co-Creation	Health Community
	Priharsari, D., Abedin, B. and Mastio, E. (2020), "Value co-creation in firm sponsored online communities: What enables, constrains, and shapes value", Internet Research, Vol. 30 No. 3, pp. 763–788. https://doi.org/10.1108/INTR-05-2019-0205	Online Community, Literature Review, Value Co-Creation, Online Co-Creation Community	2020	Internet Research IF 4.109	Community; Co-Creation	Value Creation	Health Community
	King, C., Murillo, E., Wei, W., Madera, J., Tews, M.J., Israeli, A.A. and Kong, L. (2019), "Towards a shared understanding of the service experience – a hospitality stakeholder approach", Journal of Service Management, Vol. 30 No. 3, pp. 410–428. https://doi.org/10.1108/JOSM-11-2018-0375	Hospitality Industry, Service Experience, Stakeholder, Service Eco-System, Community of Practice	2019	Journal of Service Management IF 3.23	Community; Ecosystems	Health Ecosystem	Health Community
	Loignon, C., Dupéré, S., Fortin, M. et al. Health literacy – engaging the community in the co-creation of meaningful health navigation services: a study	Health Literacy, Participatory Action Research, Knowledge Translation, Co-Creation, Health Literacy, Aboriginal Peoples, Underserved Populations	2018	Bmc Health Services Research IF 1.932	Health Literacy; Community Health	Knowledge Translation	Knowledge Transfer

	protocol. BMC Health Serv Res 18, 505 (2018). https://doi.org/10.1186/s12913-018-3315-3						
	Kofi Osei-Frimpong, Alan Wilson, Fred Lemke Patient co-creation activities in healthcare service delivery at the micro level: The influence of online access to healthcare information, Technological Forecasting and Social Change, Volume 126, 2018, Pages 14–27, ISSN 0040-1625, https://doi.org/10.1016/j.techfore.2016.04.009.	Value Co-Creation, Online Health Information, Service Encounter Process, Healthcare, Mixed Methods	2018	Technological Forecasting and Social Change IF 3.815	Public Health; Co-Creation	Value Creation	Knowledge Transfer
	Jull, J., Giles, A. & Graham, I.D. Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. Implementation Sci 12, 150 (2017). https://doi.org/10.1186/s13012-017-0696-3	Community-Based Participatory Research, Integrated Knowledge Translation, Engagement, Collaboration, Health Systems, Co-Creation, Knowledge, Implementation	2017	Implementation Science IF 4.525	Community; Knowledge Management; Value Creation	Co-Creation	Health Community
	*Amann J, Rubinelli S Views of Community Managers on Knowledge Co-creation in Online Communities for People With Disabilities: Qualitative Study, J Med Internet Res 2017;19(10):e320 DOI: 10.2196/jmir.7406	Community Networks, Internet, Patient-Centered Care, Telemedicine, Community Participation, Co-Creation	2017	Journal of Medical Internet Research IF 4.94	Community Management; Online Communities; Co-Creation	Co-Creation	Health Community
	GREENHALGH, T., JACKSON, C., SHAW, S. and JANAMIAN, T. (2016), Achieving Research Impact Through Co-creation in Community-Based Health Services: Literature Review and Case Study. The Milbank Quarterly, 94: 392-429. doi:10.1111/1468-0009.12197	Co-Creation, Knowledge Production, Health Research Systems	2016	Milbank Quarterly IF 7.425	Community Heath; Co-Creation	Co-Creation	Health Community
	Stephen P Osborne, Zoe Radnor & Kirsty Strokosch (2016) Co-Production and the Co-Creation of Value in Public Services: A suitable case for treatment?, Public Management Review, 18:5, 639–653, DOI: 10.1080/14719037.2015.1111927	Co-Production, Public Services Reform, Active Citizens, Active Communities, Public Service-Dominant Logic, Co-Creation, Public Value	2016	Public Management Review IF 3.162	Public Health; Health Services	Co-Creation	Health Community
	By:Van Oerle, S et al. Coordinating online health communities for cognitive and affective value creation August 2016 Journal of Service Management 27(4):481–506 DOI: 10.1108/JOSM-09-2015-0264	Value Drivers, Health Services, Services Management, Service Co-Creation	2016	Journal of Service Management IF 3.23	Health Communities	Value Creation	Knowledge Transfer
	Zhao, J., Wang, T. and Fan, X. (2015), "Patient value co-creation in online health communities: Social	Co-Creation, Health Services	2015	Journal of Service Management	Health Services	Co-Creation	Knowledge Transfer

	identity effects on customer knowledge contributions and membership continuance intentions in online health communities", Journal of Service Management, Vol. 26 No. 1, pp. 72–96. https://doi.org/10.1108/JOSM-12-2013-0344			IF 3.23			
	*Kitson, A., Powell, K., Hoon, E. et al. Knowledge translation within a population health study: how do you do it?. Implementation Sci 8, 54 (2013). https://doi.org/10.1186/1748-5908-8-54	Knowledge Translation, Population Health, Engaged Scholarship, Co-KT Framework, Health System Redesign	2013	Implementation Science IF 4.525	Knowledge Management	Knowledge Translation	Knowledge Transfer
KNOWLEDGE TRANSFER AND OPEN INNOVATION							
	C. Anthony Di Benedetto, Adam Lindgreen, Marianne Storgaard, Ann Højbjerg Clarke, How to collaborate really well with practitioners, Industrial Marketing Management, Volume 82, 2019, Pages 1–8, ISSN 0019-8501, https://doi.org/10.1016/j.indmarman.2019.08.001.	Academics, Businesses, Collaboration, Innovation, Practitioners, Research, Societal Impact, Universities	2019	Industrial Marketing Management IF 4.779	Collaboration	Knowledge Translation	Knowledge Transfer
	Chifundo Kayoka, Ambumulire Itimu-Phiri, Adam Biran, Rochelle H. Holm, Lasting results: A qualitative assessment of efforts to make community-led total sanitation more inclusive of the needs of people with disabilities in Rumphi District, Malawi, Disability and Health Journal, Volume 12, Issue 4, 2019, Pages 718–721, ISSN 1936-6574, https://doi.org/10.1016/j.dhjo.2019.05.007	Disability, Malawi, Open Defecation Free, Program Implementation, Sanitation	2019	Disability and Health Journal IF 1.471	Disease Management; Community Empowerment	Health Management	Knowledge Transfer
	Yun, J.J.; Liu, Z. Micro- and Macro-Dynamics of Open Innovation with a Quadruple-Helix Model. Sustainability 2019, 11, 3301. https://www.mdpi.com/2071-1050/11/12/3301#cite https://doi.org/10.3390/su11123301	Sustainability, Open Innovation, Micro Dynamics, Macro Dynamics, Quadruple-Helix, Innovation Ecosystem	2019	Sustainability IF 2.592	Ecosystems	Open Innovation	Knowledge Transfer
	Secundo, G., Toma, A., Schiuma, G. and Passiante, G. (2019), "Knowledge transfer in open innovation: A classification framework for healthcare ecosystems", Business Process Management Journal, Vol. 25 No. 1, pp. 144–163. https://doi.org/10.1108/BPMJ-06-2017-0173	Open Innovation, Intermediary Networks, Healthcare Ecosystem, Knowledge Flow, Knowledge Transfer	2019	Business Process Management Journal IF 1.88	Knowledge Management	Healthcare Ecosystems	Knowledge Transfer
	Randhawa, K., Josserand, E., Schweitzer, J. and Logue, D. (2017), "Knowledge collaboration between organizations and online communities: the role of	Communities of Practice, Open Innovation, Knowledge Management, Innovation Intermediaries	2017	Journal of Knowledge Management	Community Empowerment;	Knowledge Translation	Knowledge Transfer

	open innovation intermediaries", Journal of Knowledge Management, Vol. 21 No. 6, pp. 1293–1318. https://doi.org/10.1108/JKM-09-2016-0423			IF 4.604	Knowledge Management		
	Julia Olmos-Peñuela, Paul Benneworth, Elena Castro-Martínez, Does it take two to tango? Factors related to the ease of societal uptake of scientific knowledge, Science and Public Policy, Volume 43, Issue 6, December 2016, Pages 751–762, https://doi.org/10.1093/scipol/scw016	Research Structures, Hybrid Scientific Governance, Research Micro-Practices, Open Research Behaviours, Openness, Scientists' Characteristics	2016	Science and Public Policy IF 1.575	Society	Knowledge Translation	Knowledge Transfer
	FARRER, L., MARINETTI, C., CAVACO, Y., & COSTONGS, C. (2015). Advocacy for Health Equity: A Synthesis Review. The Milbank Quarterly, 93(2), 392–437. Retrieved May 27, 2020, from www.jstor.org/stable/24369857	Social Determinants of Health, Consumer Advocacy, Evidence-Based Policy, Vulnerable Populations	2015	Milbank Quarterly IF 7.425	Social	Health Management	Knowledge Transfer
	*McKibbon, K.A., Lokker, C., Keepanasseril, A. et al. WhatisKT wiki: a case study of a platform for knowledge translation terms and definitions – descriptive analysis. Implementation Sci 8, 13 (2013). https://doi.org/10.1186/1748-5908-8-13	Diffusion of Innovations, Research, Knowledge Translation, Implementation Science	2013	Implementation Science IF 4.525	Knowledge Management; Difussion of Innovation	Knowledge Translation	Knowledge Transfer

*Article found in more than one category of results

Appendix 3. List of Secondary Sources

TYPE	SOURCE
1. Facebook page	Facebook page of Open Health Community EN *"Academy for family"*: https://www.facebook.com/akademijaseimai/about and posts related to research
2. Facebook page	Facebook page of Open Health Community EN *"Pregnancy and all about it"*: https://www.facebook.com/groups/684182591638628 and posts related to research
3. Facebook page	Facebook page of Open Health Community EN *"Gestational diabetes"*: https://www.facebook.com/groups/465626670895378 and posts related to research
4. Facebook page	Facebook page of Open Health Community EN "*All about bariatric surgeries*": https://www.facebook.com/groups/135165867167535 and posts related to research
5. Facebook page	Facebook page of Open Health Community EN "*Thyroid diseases*": https://www.facebook.com/groups/1014134355292315 and posts related to research
6. Facebook page	Facebook page of Open Health Community EN *"Cardiovascular diseases"*: https://www.facebook.com/groups/878805772780466 and posts related to research
7. Facebook page	Facebook page of Open Health Community EN *"Plastic surgeries"*: https://www.facebook.com/groups/1843961982584661 and posts related to research
8. Patient portal	Patient portal for the lectures of Open Health Community EN *"Academy for family"*: http://mokymai.kaunoklinikos.lt/course/index.php?categoryid=132
9. Documents	Seimas of the Republic of Lithuania. Resolution No Xii-964 of Approval of the Lithuanian Health Strategy 2014–2025: https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/35834810004f11e4b0ef967b19d90c08?jfwid=-fxdp770g and https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/608a896236f811e6a222b0cd86c2adfc?jfwid=-fxdp770g
10. Documents	Obstetrics diagnostic and treatment methods by Ministry of Health of the Republic of Lithuania: https://sam.lrv.lt/lt/veiklos-sritys/programos-ir-projektai/sveicarijos-paramos-programa/akuserijos-ir-neonatologijos-diagnostikos-ir-gydymo-metodikos/akuserijos-diagnostikos-ir-gydymo-metodikos
11. Draft of Legalisation	Ministry of Health of the Republic of Lithuania. Approval of the Health Preservation and Strengthening Development Program of the Ministry of Health Protection of the Republic of Lithuania, Manager of the 2021–2030 Development Program: https://e-seimas.lrs.lt/portal/legalAct/lt/TAP/2c4181605cb111ecb2fe99

	75f8a9e52e
12. Article	Ministry of Health of the Republic of Lithuania. Good health means longer life by WHO: *https://sam.lrv.lt/lt/naujienos/gera-sveikata-ilgesnis-gyvenimas*
13. Article	Ministry of Health of the Republic of Lithuania. Reform of health care institutions: the scope, availability and quality of services will increase: https://sam.lrv.lt/lt/naujienos/sveikatos-prieziuros-istaigu-reforma-dides-paslaugu-apimtys-prieinamumas-ir-kokybe
14. Publication	Ministry of Health of the Republic of Lithuania.. HEALTH21: an introduction to the health for all policy framework for the WHO European Region: *https://sam.lrv.lt/uploads/sam/documents/files/Health-21-WHO.pdf*
15. Website	Ministry of Health of the Republic of Lithuania. Public organizations of patients: *https://sam.lrv.lt/lt/nuorodos/visuomenines-organizacijos/pacientu-organizacijos*
16. Website and articles	Website for searching for doctors and registering for a visit online. Popular articles related to women's lifelong health: *https://www.manodaktaras.lt/naujienos/tema/moters-sveikata*
17. Website	Wikipedia – the free encyclopedia. The evolution of women's lifelong health: *https://lt.wikipedia.org/wiki/Moteris*

UDK 005.94+614.2+316.453](043.3)

SL344. 2024-05-07, 26,75 leidyb. apsk. l. Tiražas 14 egz. Užsakymas 26,75.
Išleido Kauno technologijos universitetas, K. Donelaičio g. 73, 44249 Kaunas
Spausdino leidyklos „Technologija“ spaustuvė, Studentų g. 54, 51424 Kaunas