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Thesis, 2024

# **USER EXPERIENCE OF DIGITAL HEALTHCARE SERVICES IN FINLAND FROM THE CUSTOMER PERSPECTIVE**

**A literature review**



## ABSTRACT

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User Experience of Digital Healthcare Services in Finland from the Customer Perspective

57 Pages and 3 attachments

Spring 2024

Diaconia University of Applied Sciences

Master of Healthcare

Master's Degree Programme in Global Change and Community Development

This thesis explores the user experience of digital healthcare solutions in Finland, focusing on the customer's experience. During the past two decades digitalisation became deeply integrated into healthcare in Finland. Ongoing technological advancements are causing products to become increasingly complex and challenging to use. The importance of user experience rapidly expands as it enhances understanding of users' interactions with the product. This thesis is targeted to healthcare professionals as it investigates main aspects and sources of user experience of digital healthcare platforms in Finland.

This thesis reviews the data of academic studies conducted between 2016 and 2023 with a purpose to identify customer experiences with digital healthcare platforms in Finland. Altogether 13 academic articles were selected for this thesis work. A systematically performed descriptive literature review was conducted focusing on healthcare customer experience with the aim to address the main aspects of user experience that existing studies of digital healthcare platforms have revealed. Additionally, the aim is to identify the sources of user experience of digital healthcare platforms from customer perspective. The thesis was conducted in collaboration with Diaconia University of Applied Sciences (Diak) and provides insights for healthcare professionals and students in the field.

Thematic data analysis was performed with selected articles revealing in various ways how customers benefit from digital healthcare services. Healthcare customers appreciate convenience, flexibility, and accessibility of digital healthcare services. Digital healthcare services provide customers with needed support and motivate their active involvement in care. However, customer feedback also calls for improved affordability, usability, and engagement features, as well as better access to health information and improved communication between healthcare customer and healthcare provider via digital healthcare services. Understanding these experiences is vital as it can illuminate developmental needs in digital healthcare solutions.

Keywords: UX, digital healthcare, digital solutions, customer perspective, Finland

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## LIST OF ABBREVIATIONS

JB	Joanna Brigg's Institution
KASTE	Social- and Healthcare National Developmental Program
SOTE	Social- and healthcare reform

## 1 INTRODUCTION

Tendency for the nearest future has shown that it is expected to focus healthcare change on the type of the customer, that will be actively participating in their health management while consuming healthcare services. The needs and expectations of customers guide the developmental processes in the healthcare industry. The main changes are seen to be in individualisation of health services, comfort, speed, and immediacy in service delivery. The process of digital transformation in healthcare undergoes changes with the gradual involvement of digital technologies to the healthcare modalities and best practices. (Stoumpos et al., 2023.)

Digital healthcare services include various healthcare products, services and processes that utilize information and communication technology. Digital healthcare covers the exchange of information and interaction between the healthcare service provider and customer, along with the transmission of the data between them. (Saranto et al., 2020.) Digital healthcare services may target, for example, maintenance of customer's functional capacity, remote supervision and reassessment of health-related customer's plans and facilitating home-based coping strategies. Contact channels such as online video connection and smartphone are used in transmission of information and documentation which is later used as a base for treatment-related decisions in digital healthcare services including examination, diagnosis, monitoring, and treatment. (National Supervisory Authority for Welfare and Health, 2022.)

The evidence from recent studies indicates that in psychological and health related issues online treatment programs are as effective as traditional face-to-face interventions, particularly the one incorporating personalised support (Pulkkinen & Pietiläinen, 2016). Using remote healthcare platforms allowed customers to get easier access to health-related guidance as well as independence from location and time, ensured more easily tailored communication with healthcare provider and reduced the transmission of infectious diseases (Virtanen et al., 2022). On

the other hand, digitalization process encountered various challenges. According to previous research results, some healthcare users experience various problems with using digital healthcare services. (Kaihlanen et al., 2022.) The ability of older generation to use online healthcare services significantly ranges. The reason behind this is the difference in informational technology skills. (Pyörälä, 2021.)

Technological advancements come along with the increasing diversification of the user demographics. The significance of investigating user experience escalates gradually as products become more intricate and interaction with the product present greater challenges in terms of navigation. User experience encompasses an individual's interaction process on top of thoughts, feelings, and insights resulting from the interaction with something. (Albert & Tullis, 2013.)

The literature search process for this thesis work have shown that despite the large number of academic studies investigating user experience of digital healthcare services in Finland, most of them are focused on the data collected from healthcare personnel and less research has focused on the customer perspective even though that the customer orientation guides developmental work in healthcare. One possible approach to achieve even higher user satisfaction among customers would be to develop a broader understanding of their experiences while using digital healthcare services and use this knowledge in developmental work. Because customer groups are one of the large user groups, customer experiences can bring more light on developmental needs in digital healthcare solutions.

The purpose of the current study is to identify what kind of experiences of using digital healthcare platforms customers have had in Finland based on current research studies. The aim of this work is to develop a descriptive report about the subject for later use. To accomplish this aim, the thesis established a literature review to seek for the answer two research questions:

- 1) What are the main aspects of user experience that existing studies of digital healthcare platforms have revealed?
- 2) What are the sources of user experience of digital healthcare platforms?

The scope of the thesis was limited to the review of feedback data from customers sharing experiences about contacting and cooperating with healthcare provider through digital healthcare services of Finland and published between 2016 – 2023 timeframe in English or Finnish languages. Research literature outside of inclusion criteria was not included in the scope. The focus of presented thesis work was oriented towards research. Research was performed systematically as a descriptive literature review with the support of Diak as a working life partner. The results of the study are presented systematically describing all the steps of data collection and analysis. Diak is the beneficiary of the thesis results as the results of the study will be presented as a recorded lecture in the Digital Health and Wellbeing Promotion online course, where the participants are either working social- and healthcare professionals or students in the field.

## 2 DIGITAL HEALTHCARE SERVICES AND THEIR USE

Digitalisation has already integrated and found its place in daily life of people in Finland. The meaning of digitalisation in terms of healthcare incorporates the integration and implementation of web-based platforms in healthcare systems. It also includes application of online health information system, electronic services provided for the use of customers, as well as web-based healthcare related information. (Pyörälä, 2021.)

Within current paradigms, the advancement of digitalisation related expertise and innovation in Social- and Healthcare serves as a catalyst for the Finnish government's efforts to foster effective cooperation between the public and private sector. Legislation provides support to the progression of digitalisation. The Digital Social- and Healthcare program and its leadership implementation are in development, expanding the availability and use of digital services and focusing on prioritising the correct user group, while also reviewing the impact of national solutions. Governmental programs strive to take the needs of different user groups

into consideration. It aims to ensure the user-friendliness of digital solutions as well as equal access to the right type of digital solutions for everyone including access to in-person appointments and phone services when needed. (The Finnish Government, 2023.)

## 2.1 Progression of healthcare digitalization in Finland

Various changes have been implemented in Finland to enable the provision of healthcare services digitally. The data protection act (1050/2018) came into effect in 2018, then the act of digital processing of social- and healthcare users' data came into effect in 2021 (784/2021) guiding healthcare service providers in offering remote services to the users. (Finlex, 2021.) The informed consent of the customer is required for conducting healthcare service digitally. The one can also be revoked any time during the service. The documentation of digital service and identification methods must meet relevant regulations. (National Supervisory Authority for Welfare and Health, 2022.)

Development of digital healthcare services has been supported by different projects. One example of such a program is Social- and Healthcare National Developmental Program (KASTE) 2008-2011, which have started to expand customers' opportunities to use digital healthcare services by developing digital solutions that are both serving the customer and answering social- and healthcare needs. (Ministry of Social Affairs and Health, 2008.) DigiFinland- project is working on development and implementation of public digital services in healthcare (DigiFinland, 2022).

Kanta- service is a nationwide healthcare information system that enables digital interaction for customers and informational exchange between different healthcare providers at the same time maintaining electronic archive of customers' information (Kanta, 2023). Development of a national electronic archive of customer health related information was one of the main goals of digitalisation



processes in healthcare of Finland. Digital archive of customer information allows good availability and up-to date information everywhere around Finland for all the healthcare organisations and customers themselves. The need of the customers to get access to their health-related information made grounds for creating the national service My Kanta, which has become one of the most used among digital healthcare services in Finland. The service is not only opening access to the informational files like customer report texts, examination results, X-ray reports and drug prescriptions but also gives customers the possibility to participate in the decision making regarding their treatment plan. (Pyörälä, 2021.)

Healthcare faces the challenge of delivering services efficiently with existing resources to an ageing population that is expected to increase in the coming decades. A renewal initiative for services was implemented within the project Virtual Hospital 2.0. Planning of digital healthcare services caused the change in a way healthcare professionals looked at the clinical requirements, service pathways, work processes and methodologies. Fundamental shift in operations was necessary to plan and implement services digitally. (Arvonen & Lehto-Trapnowski, 2019.) The Health Village online service package was developed under the project Virtual Hospital 2.0 enhancing individuals' ability to maintain their own well-being, monitoring quality of life, symptoms and lifestyle habits as well as supporting self-management while living with chronic illnesses. The online service encompasses guides for customers, self-directed pathways, chat service, Chatbot, symptom navigator and online courses for professionals. Self-directed pathways include both social service and healthcare paths and allow to either complement or replace traditional in-person visits. (Healthvillage, 2022.)

Under the SOTE – information for utility use 2020 project the work on increasing the electronic data exchange between healthcare provider and healthcare customer continued. Data use means to be more independent both for individuals and medical professionals in their clinical work, organisations management or research. Increase in the use of online services aims to improve citizen's ability to manage welfare information, thus motivate citizen's to be more active in life management, well-being management and self-care. Information about the quality of the services and services availability is moved the public access. Citizens

can access online services by themselves from anywhere and produce welfare information for their own use and for the use of medical professionals. The access to online services is available for all types of people including special groups. (Ministry of Social Affairs and Health, 2014.)

Talking more about different types of digital healthcare services, traditional and in-person visits have been found generally comparable to one another by Ministry of Social Affairs and Health. Video online communication is used for assessing health related problems, examination, and treatment whether the service is suitable for remote delivery. (Ministry of Social Affairs and Health, 2015.) Digital callbacks are used for customers to contact healthcare providers. The service allows us to perform the evaluation for the need of clinical assessment and provide general guidance and counselling when needed. (Syväoja & Äijälä, 2009.) Chat consultations might be more favoured in some customer groups than digital callback for the ability to get in touch with healthcare provider independently of time or location. Chat consultations are used to address customers' needs that do not require physical assessment. (Pyörälä, 2021.) Automatised platforms like Chatbot Hester provide basic health related counselling around the clock (Helsinki city, 2024). Private healthcare providers have opened their own online platforms for customer use. Platforms carry customers' health related information and allow electronic appointment booking. According to the research information, electronic booking was found to be an important feature by customer users. (Pyörälä, 2021.)

## 2.2 Acquired skills for using digital healthcare services.

To use digital healthcare services, the population must have sufficient information technology skills and motivation as well as equipment for the use of digital services and internet connection (Hyppönen & Ilmarinen, 2016). Information and communication technology can be utilised while managing personal health-related information, using digital healthcare services, and communicating online

about health-related issues. There are still groups of people that might have limited skills to utilise health-related digital information and services. Difference in ability to access internet might also cause inequality in access to the health information. (Kontos et al., 2014.)

The biggest obstacles to the use of digital healthcare services are related to the lack of motivation, trust to digitalised services, technical issues, doubt about effectiveness or difficulties while using digital healthcare services. These types of obstacles are especially affecting the ability of the group of 50–65 years old people to reach digital healthcare services. (Hyppönen et al., 2014.) According to the research, despite challenges, many over 65 years old people are still motivated to use electronic social and health care services. Assistance and support in using digital services should be provided to not only elderly but also any other customer facing difficulties with using online platforms. (Pyörälä, 2021.)

### 2.3 User experience

The role of user experience grows rapidly as products that people are using become more complex and often harder to use. Changes happening in technologies are accompanied by user groups becoming more diverse with time. Researching user experience allows us to gather information about the personal experience of the person using some product, it enlightens perception about users' interaction with the product. (Albert & Tullis, 2013.)

Considering user experience in the design of digital services is essential for addressing individuals' priorities in digital healthcare services. Products that are perceived as easy to use, useful, easy to access, and valuable are more likely to enhance user experience. However, some features can lead to feelings of dissatisfaction. There is a need for further research on different aspects of user experience of using digital healthcare services. (Wang et al., 2022.) In this thesis user

experience was defined as healthcare customers' perceptions resulting from the use of digital healthcare services in Finland.

### 3 PURPOSE, AIM OF THE THESIS AND RESEARCH QUESTIONS

Selection of the topic for this thesis stems from the interest in understanding the user experience of digital healthcare solutions in Finland from customer's perspective. The purpose of this thesis is to examine the experiences that customers in Finland have had with digital healthcare platforms, drawing insights from the latest existing research studies. This attempt aims to develop a descriptive report about the subject for future reference.

To achieve the aim, the thesis will undertake a thorough literature review to address the following research questions:

- 1) What are the main aspects of user experience that existing studies of digital healthcare platforms have revealed?
- 2) What are the sources of user experience of digital healthcare platforms?

The first research question seeks to explore various dimensions of user experience identified in the existing literature, while the second research question focuses on identifying sources that contribute to shaping the user experience of healthcare customers interacting with digital healthcare platforms in Finland.

### 4 PARTNERS

Thesis work is planned to be performed for Diak as a working life partner. Diak is a privately owned national higher educational institution originated on Finland.

Diak has campuses in Helsinki, Oulu and DiakHub Eastern Finland and provides educational places for approximately 3,200 students as well as working space for 260 employees. Diak is a community with multicultural and multi-faith environment for work and studying. (Diak, 2024.) Diak is a beneficiary of this research paper. A six-minute lecture about the current study was video-recorded in Finnish language for the online course of Diak open university platform to share the results with the nursing students and other working social- and healthcare professionals in the field.

Getting some knowledge about current digital trends in medicine of Finland can be helpful for current and future medical and social professionals. The knowledge can be applied within the process of working with different customer groups. Choosing the right digital tools in clinical assistance can improve customer-oriented approach in working environment.

## 5 RESEARCH METHODS AND THESIS PROCESS DESCRIPTION

The organization of the research methods and thesis process description section is as follows. Subsection 5.1 focuses on describing type of the literature review chosen for this thesis. Subsection 5.2 describes the process of key words identification, including the PICO method. Thirdly, subsection 5.3 presents the process of literature search and criteria for inclusion and exclusion. Next, subsection 5.4 explains the process of critical appraisal, which was used to ensure the methodological quality of this thesis work. Lastly, the section of the research methods and thesis process description is finalised by presenting general knowledge about data analysis process of this thesis work in the subsection 5.5

## 5.1 Literature review

Literature review is the type of research method that summarises existing research evidence. Review can be not only a part of larger work but also a stand-alone product including different types such as: narrative review, an expert view, critical review, systematic review, or meta-analysis. All the review types are often based on a systematic literature review. (Hempel, 2019.)

This thesis is written systematically as a descriptive literature review. Descriptive literature review means to describe the phenomenon, search for the answer to the questions of what is already known about the phenomenon and central concepts of the phenomenon. The analysis of the research data is performed to review the questions raised by the earlier research of the phenomenon, investigate previous information for contradictions and informational gaps and form a new perspective on the phenomenon based on the previous information. (Kangasniemi et al., 2013.)

The base of the review comes from the research question. Descriptive, qualitative results are produced based on selected research literature. The review's stages include: 1) Identifying the research question, 2) data collection, 3) producing the description in the process of data analysis, 4) observation of the defined results. The review process includes constructing ethical questions on the stage of identifying research questions and applying research ethical principles at all stages of the review process. (Kangasniemi et al., 2013.)

The systematic approach differs from the narrative literature review by using a rigorous research methodology to limit bias in all aspects of the research process. Research is called a systematic review when the study is performed following steps of identifying relevant literature, performing critical appraisal of collected data and summarising research evidence by using scientific methodology. Review is performed to answer research questions by analysing all the possible relevant studies as a literature source. (Bettany-Saltikov, 2012.)

## 5.2 Identifying key words

Research questions guide the choice of the data collected for the research. Collecting the research data, the goal is to find the most recent research material answering the research question. Research methods are also affecting the data collection process as the type of collected data highly depends on how the research data is planned to be analysed. (Kangasniemi et al., 2013.)

The PICO method was used to identify keywords for further research. PICO format goes for: P as population or targeted participants in clinical environments; I as intervention needed for research practice; C as comparisons of interventions to ascertain the optimal intervention for research practice; O as outcomes needed for practice and methods for assessing the outcomes in research practice. (Grove & Gray, 2022.) The PICO categorization process includes key word identification as well as presentation of search terms and search strategies is described below in Table 2.

PICO Elements	Keywords	Search terms	Search strategies
P = population	Customer perspective, experience	Customer experience	Customer attitudes OR customer experiences OR customer opinions OR customer perceptions OR customer perspective OR customer satisfaction OR customer views
I = intervention	Finland	Finland	Finland OR Finnish
C = comparison	Digital healthcare	Digital healthcare	Digital health OR digital healthcare OR eHealth OR mHealth OR mobile health OR tele-care OR Telehealth OR tele-nursing OR telemedicine
O = outcome	Not relevant		

TABLE 2. PICO categorization

### 5.3 Data collection

Identified search strategies were used for the literature search in Medic, Medline, and CINAHL databases. Medic is Finnish medical bibliographic database that is collecting references and articles from domestic sources including medical journals, university, and research institution's reports. Medline database was created by the National Library of Medicine, collecting references from current biometrical journals using MeSH indexing. CINAHL is the world's most comprehensive research tool providing full-text nursing and allied health journals indexed in CINAHL. All the databases were chosen as they collect nursing and healthcare scientific literature and were anticipated proving beneficial for collecting relevant literature for the review.



All the inclusion and exclusion criteria are presented in Table 3. For the article to be included for the review, literature had to answer at least one research question and ought to data from Finland. Access to full text of an article must be available for free, article is expected to be written in English or Finnish language and published within 2016–2023 timeframe.

Limiting research articles to those describing results collected in Finland was agreed upon with the working life partner. This approach allows for an in-depth exploration of the subject matter. It also allows for the collection of information, providing nursing students and other working social- and healthcare professionals in the field with the recent knowledge that is applicable in healthcare environment in Finland.

The timeframe was agreed upon with the working life partner. Conducting a literature search was challenging, as there were relevantly few academic studies previously conducted to define the user experience of digital healthcare services in Finland from customer's perspective. The selected timeframe proved beneficial in the literature search, allowing to collect sufficient number of studies for a comprehensive literature review and ensure the relevance of the results of data analysis.

Inclusion criteria	Exclusion criteria
Data source should answer at least one research question.	Outside the studying topic
Research literature should be collecting research data from Finland.	Research literature including Research results from outside Finland
Access to full text for free	No access to full text without payment
Published between 2016-2023	Publication period outside 2016-2023
Published in English or Finnish	Published in other languages than English or Finnish

TABLE 3. Inclusion and exclusion criteria to literature search

Literature search process is presented in Table 4. Search terms were selected individually for each database with the help of a librarian specialist to create the most effective search strategy and to gain the most relevant data for further

analysis. There were overall 54 references found through Medic, Medline and CINAHL databases using the search terms presented below. Out of which 4 references were selected from Medic, 48 references through Medline and 2 references through CINAHL. Identified scientific papers were then analysed in accordance with exclusion and inclusion criteria based on title, abstracts, and full text. After the screening process, a total of 13 references were included for data analysis. Among them, five articles used questionnaires to collect data and presented quantitative results, four articles utilized interviews for data collection and presented qualitative results, and four articles used mixed methods. Sources of research data are presented in Appendix 3.

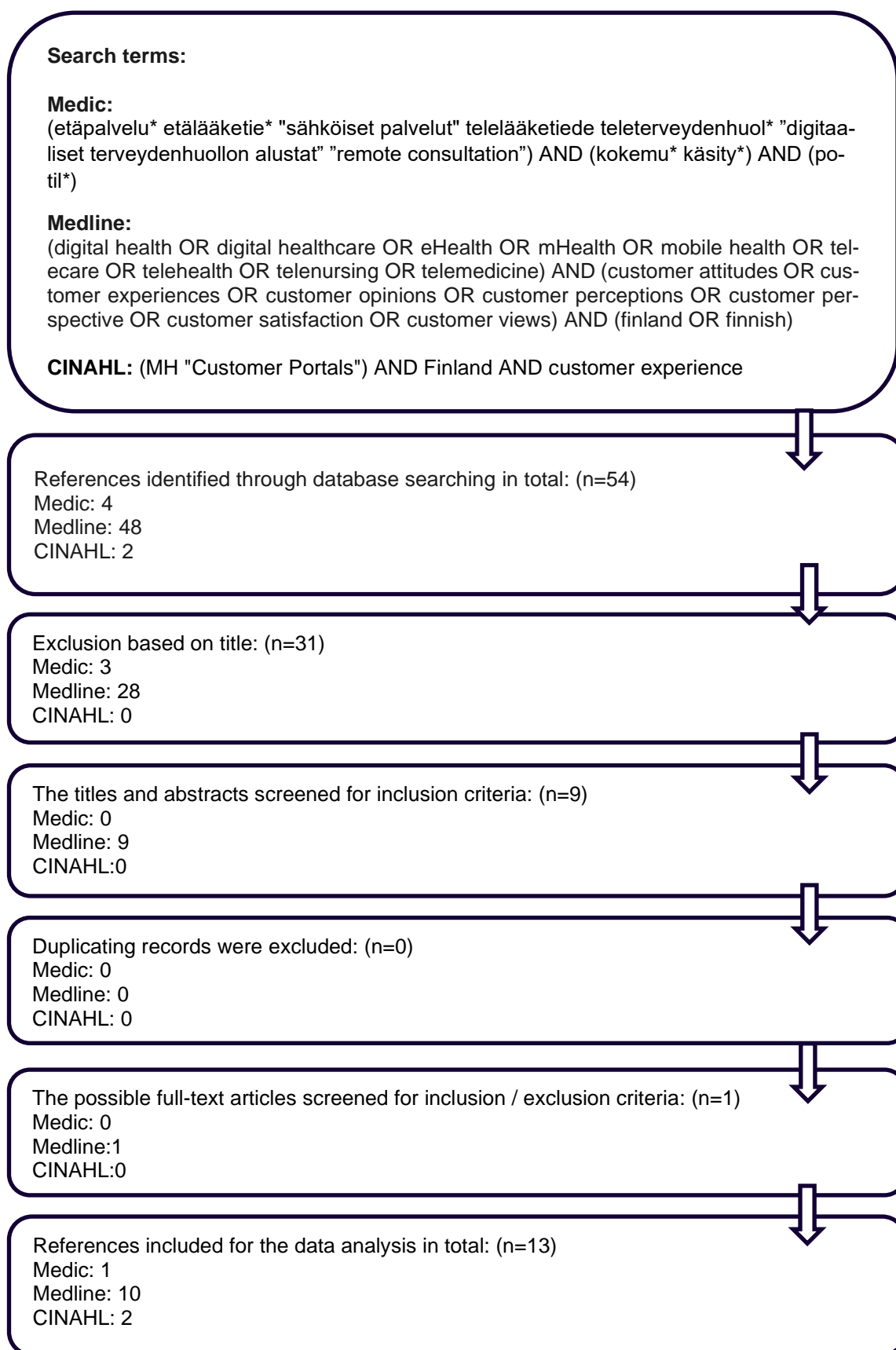


TABLE 4. Flow chart

## 5.4 Critical appraisal

Collected literature for the review underwent verification by using appraisal tool of Joanna Briggs Institute (JBI). This procedure was performed to ensure the methodological quality of this thesis work and assess the magnitude to which a study has considered the possibility of bias in this study's structure, conduct and analysis. (Lockwood et al., 2015.) Papers selected for this study have met the inclusion criteria described in Table 3.

JBI is a global research institution that aims to have a positive impact on healthcare practices and health outcomes by developing and providing for use evidence-based data, software, pedagogical instructions, and training regimens. JBI Critical Appraisal Tools have been developed for the use in the literature review by the JBI and investigative associates. It got approval of the JBI Scientific Committee following comprehensive peer evaluation. Even though the tool was designed mainly for use in systematic literature reviews, it also finds application during the developing process of Critically Appraised Topics (CAT), in journals or educational resources. (Lockwood et al., 2015.)

The JBI Checklist for Qualitative Research was used to evaluate the quality of articles chosen for the research paper. The appraisal was performed by reading through each article chosen for the review and answering 10 questions such as "yes", "no", "unclear" and "not applicable". Questions of the appraisal tool were structured in a way to define the important criteria for literature review from the article, such as determining the research philosophical perspective and research methodology, research question, methods to collect data, representation and analysis of the data, interpretation of results, researcher and participant's representation, ethics, research report flow and the congruity between all the mentioned criteria. (Lockwood et al., 2015.)

Quality scoring and assessment by the JBI Critical Appraisal tool done by the reviewer is presented in Table 5. Researcher was scoring the article with one point every time the appraisal tool question was answered "yes". After reviewing

articles, the total score of every individual article was assessed as low 1-4, moderate 5-7 or high 8-11. Results of an author's critical appraisal are presented in Table 5.

Author & Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Quality
1. Virtanen et al. 2021	Y	Y	Y	Y	Y	U	U	Y	Y	Y	8	High
2. Anttila et al. 2020	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High
3. Machal & Värri, 2022	U	Y	Y	U	Y	U	U	Y	U	Y	5	Moderate
4. Eriksson-Backa et al. 2021	Y	Y	Y	Y	Y	Y	U	Y	U	Y	8	High
5. Karisalmi et al. 2019	U	Y	U	Y	Y	U	U	Y	U	Y	5	Moderate
6. Pakarinen et al. 2022	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
7. Simola et al. 2023	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High
8. Virtanen et al. 2023	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
9. Kainiemi et al. 2022	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
10. Tolvi et al. 2023	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
11. Karisalmi et al. 2018	Y	Y	Y	Y	Y	U	U	Y	Y	Y	8	High
12. Kujala et al. 2022	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High

Table 5. JBI Critical Appraisal quality scoring and assessment.

Chosen articles have been subjected to thorough appraisal by another master's level student as second critical appraiser. Both appraisals provided similar results. All 12 articles belonged to either moderate or high scored category and all of them were included for the following examination. The differences in critical appraisal evaluation are presented in Table 6.

Author & Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Quality
1. Virtanen et al. 2021	Y	Y	Y	Y	Y	U/N	U	Y	Y	Y	8	High
2. Anttila et al. 2020	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High
3. Machal & Värri, 2022	U/N	Y	Y	U	Y	U/N	U/N	Y	U	Y	5	Moderate
4. Eriksson-Backa et al. 2021	Y	Y	Y	Y	Y	Y	U	Y	U	Y	8	High
5. Karisalmi et al. 2019	U	Y	U	Y	Y	U/N	U	Y	U/N	Y	5	Moderate
6. Pakarinen et al. 2022	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
7. Simola et al. 2023	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	10	High
8. Virtanen et al. 2023	Y	Y	Y	Y	Y	U/N	Y	Y	Y	Y	9	High
9. Kainiemi et al. 2022	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
10. Tolvi et al. 2023	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9	High
11. Karisalmi et al. 2018	Y	Y	Y	Y	Y	U/N	U	Y	Y	Y	8	High
12. Kujala et al. 2022	Y	Y	Y	Y	Y	U/N	Y	Y	Y	Y	9	High

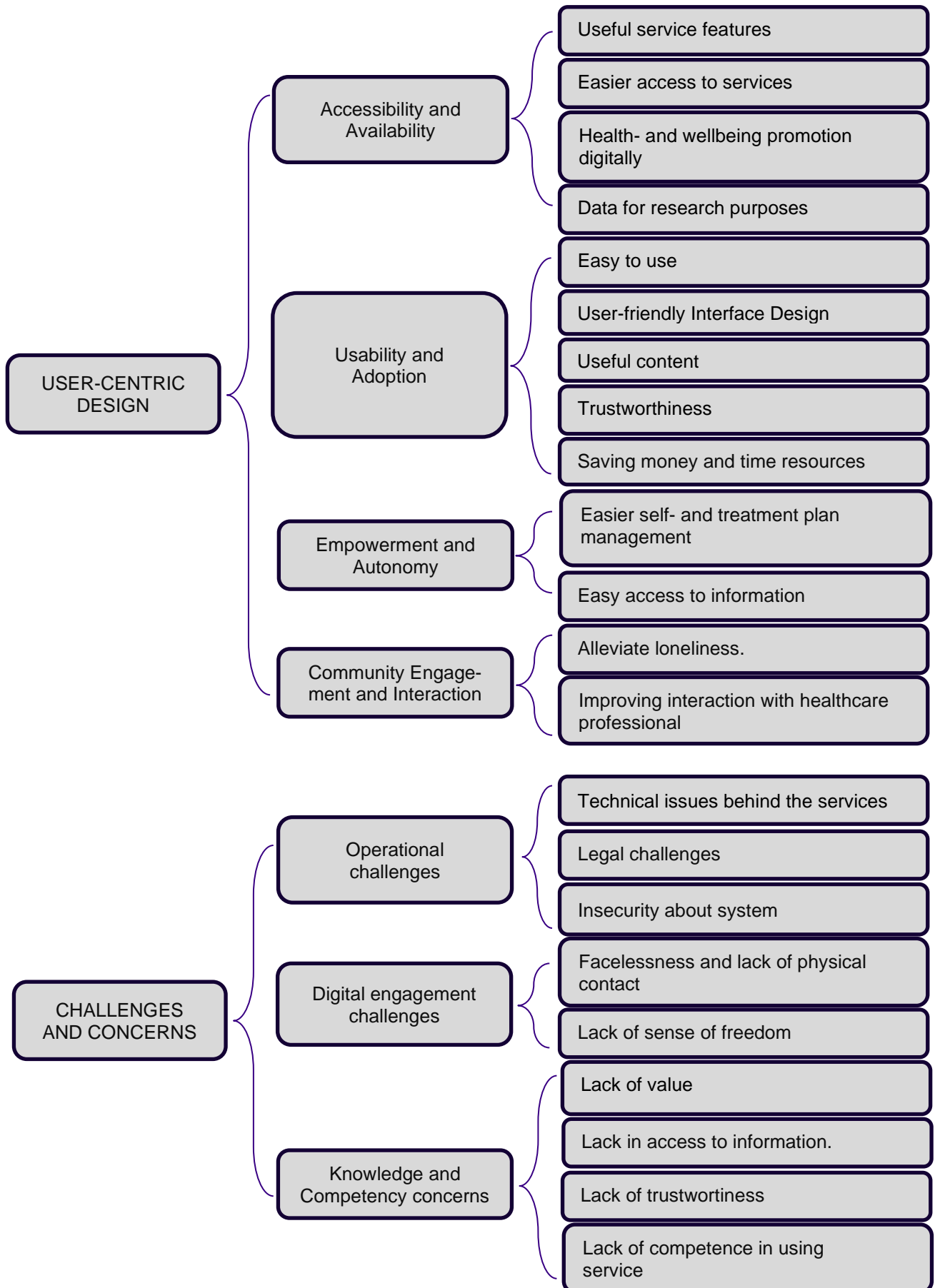
Table 6. JBI Critical Appraisal quality scoring and assessment results of two independent master's level students

## 5.5 Thematic analysis

Data analysis is performed systematically according to the guidelines of literature review process. Thematic analysis was chosen for this thesis. Thematic data analysis is a method that is used to identify, analyse, and document specific themes within research literature, however it has minimal focus on organising and describing research data in an exceedingly intricate way. (Braun & Clarke, 2006.)

According to guidelines, thematic data analysis starts with familiarising oneself with research literature by repeatedly reading chosen articles and taking notes about its main ideas. Then, data is read word by word to define codes at first highlighting words in the written text. The third step is searching for themes and writing the first impression and thoughts of the researcher, and then reviewing themes. Themes are sorted out into main themes based on the differences between initial themes, this step means to define and name main themes. Next step is reporting final research literature analysis based on identified themes. (Braun & Clarke, 2006.)

During the process of reading chosen articles various similar patterns in research data have been defined. Noteworthy patterns, including quotations and description of results from previous research have been systematically collected into the table and reviewed to name initial codes. Next step was to find similarity patterns in initial codes to combine them into thematical sub-categories accordingly. As a result, a systematic dataset including essential data organised in accordance with the shared semantic relevance was created. Next, the collected data was reviewed again to adjust and revise existing sub-categories and combine them into bigger clusters of thematic categories. At last, thematic categories were divided into three main themes. Tabular form was used to organise the data analysis process. The illustration of themes, categories and sub-categories is presented in Figure 1.



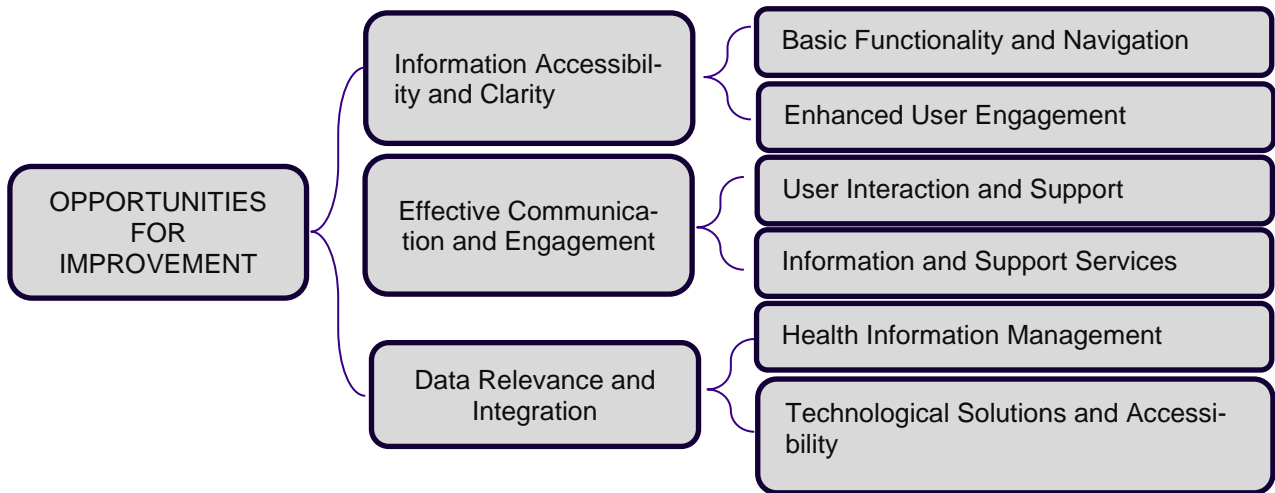


Figure 1. The illustration of themes, categories, and sub-categories

## 6 RESULTS

The thesis results describe what are the main aspects of user experience that existing studies of digital healthcare platforms have revealed and what are the sources of user experience of digital healthcare platforms. Chosen articles were systematically reviewed to discern insights regarding the encounters, that customers have had with digital healthcare platforms in Finland. Raw data was extracted into tabular form 36 pages long in Arial 10 font and single spacing. After reviewing data, three main themes consistently emerged in extant literature, encompassing user-centric design, challenges and concerns, and opportunities for improvement. The selection of these thematic categories was deliberate, aiming to present a comprehensive description of customers' experiences of using digital healthcare services in Finland. The subcategories serve to provide further clarification on the subject by opening thematic categories in thorough detail. Appendix 2 presents a summary table of the analysed data that is referred to in the description of results.

The organization of the thesis results is as follows. Healthcare customers' experiences regarding the user-centric design of digital healthcare services in Finland



are presented in section 6.1. Challenges encountered by healthcare customers and their concerns after using digital healthcare services in Finland are discussed in section 6.2. The remaining part of this thesis part, section 6.3, focuses on opportunities for improvement in digital healthcare services in Finland highlighted from the experiences of healthcare customers.

## 6.1 User-centric design of digital healthcare services

This section of the thesis focuses on the theme of user-centric design of digital healthcare services, which is divided into four main thematic categories, including: accessibility and availability, usability and adoption, empowerment and autonomy, community engagement and interaction. These thematic categories represent different aspects of how users interact with a digital healthcare service, contributing to the overall quality of their user experience. Thematic categories and subcategories of user-centric design of digital healthcare services are presented in Table 7.

Accessibility and Availability	Usability and Adoption	Empowerment and Autonomy	Community Engagement and Interaction
Useful service features	Easy to use	Easier self- and treatment plan management	Alleviate loneliness.
Easier access to services	User friendly interface design	Easy access to information	Improving interaction with the professional
Health- and wellbeing promotion digitally	Useful content		
Greater value	Trustworthiness		
	Saving money and time resources		

Table 7. User-centric design of digital healthcare services

The subsection begins by discussing the accessibility and availability thematic category, which focuses on features of digital healthcare services that were experienced as useful by users, ease of access to healthcare services, health-and

wellbeing promotion digitally and greater value in terms of future use of health-related information. A description of results for every category is presented below.

Figure 2 visually represents the features of digital healthcare service features experiences as useful by customers. Multiple studies have mentioned that among the variety of features that digital healthcare services provide, customers have experiences prescription renewal as valuable (Kujala et al., 2022; Simola et al., 2023). The same studies have also shown that viewing healthcare professionals' notes, self-reported wellness data and ability to write a living will were considered as useful features by customers (Kujala et al., 2022; Simola et al., 2023). There also was a mention of discussion support with a professional via telephone consultation as a useful feature of digital healthcare services and chat service as a successful support digital channel (Virtanen et al., 2021). Electronic appointment booking was mentioned in several studies as a service that works well (Virtanen et al., 2021; Karisalmi et al., 2019). Additionally, features such as examination results, prescriptions, EU digital COVID-19 vaccination certificate, printing and saving data, acting on behalf of an adult or a child, organ donation testament, SMS text message notification of prescriptions, and consent to, or denial of the sharing of one's own data were also mentioned in the research data as valuable digital healthcare service features (Simola et al., 2023).

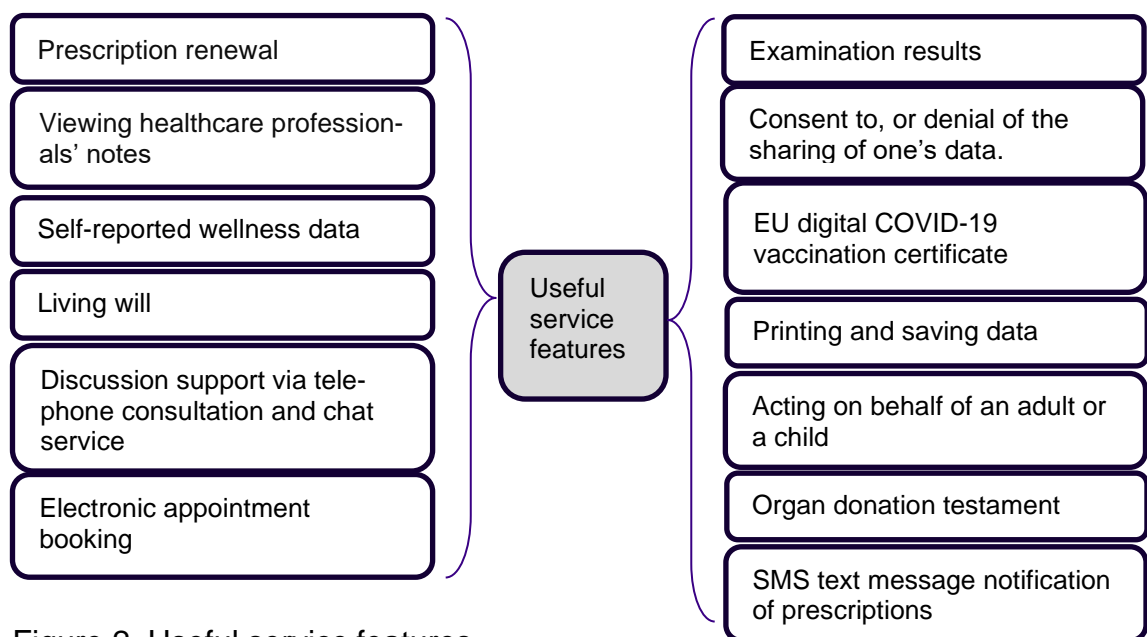


Figure 2. Useful service features

As presented in Figure 3, several studies have shown that access to services was experienced as being faster through digital healthcare services because of reduced waiting time since there was no need to queue in person or by telephone (Virtanen et al., 2021; Eriksson-Backa et al., 2021). One study showed that digital healthcare services were experienced to simplify access to services in general and in acute situations (Virtanen et al., 2021). Customers have also experienced that digital healthcare services have wider and more flexible possibilities of use and service selection because they are not time or place bound (Virtanen et al., 2021).

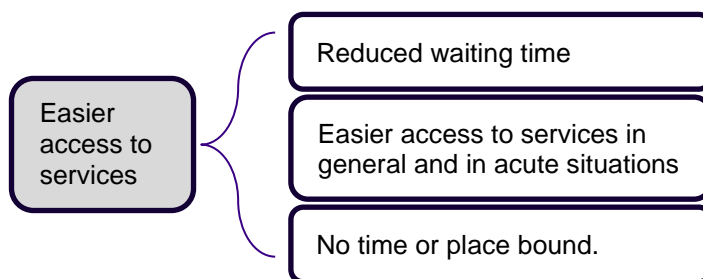


Figure 3. Easier access to services.

As presented in Figure 4, several studies have shown that customers valued the possibility of health- and wellbeing promotion digitally (Karisalmi et al., 2019; Virtanen et al., 2021; Anttila et al., 2020). One study mentioned renewing e-prescriptions as an example of the possibility to promote health- and wellbeing through digital means (Karisalmi et al., 2019). Mental health support and social interaction through digital healthcare services have been given as an example of the same matter in other studies (Virtanen et al., 2021; Anttila et al., 2020). According to one study, customers have also experienced the opportunity to access healthcare service digitally as valuable if physical contact was hard to make due to the personal reasons (Virtanen et al., 2021). One study has mentioned that customers have found even greater value in digital healthcare services because they collect individuals' health data that can be possibly used later for research purposes (Eriksson-Backa et al., 2021).

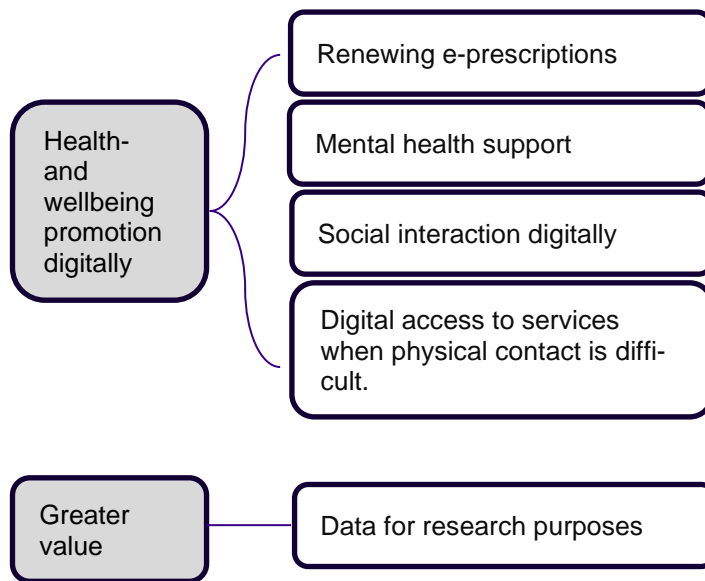


Figure 4. Health- and wellbeing promotion digitally and greater value

Moving forward, the thematic category of usability and adoption concerns the ease of use of digital healthcare services, user friendly interface design, provision of useful content, assurance of trustworthiness and saving money and time resources. The codes and subcategories for this thematic category are presented in Table 8.

Easy to use	User-friendly interface design	Useful content	Trustworthiness	Saving money and time resources
Services are well implemented and easy to use.	Graphics is helpful for self-expression	Digital service content targeted the correct user group	Digital services allow users to seek reliable health related information.	Taking care of health-related concerns through digital services saves time
Services are easy to use by telephone and video connection.	Easy functionality of digital service makes the health care process easier.	Clear expression of information	Safety of use	Saving in travel cost
Digital services work as an alternative to conventional treatments.	Pleasant visual content of digital healthcare service			Smaller fee for digital service than for face-to-face visit

Table 8. Usability and adoption

There was a mention in several studies that customers have experienced digital healthcare services as well-implemented and overall easy to use (Virtanen et al., 2021; Pakarinen et al., 2022; Anttila et al., 2020). According to one study, digital services were experienced as easy to use by telephone and video connection (Virtanen et al., 2021). According to other studies, digital services were experienced to work as an alternative to some conventional treatments (Anttila et al., 2020; Virtanen et al., 2023).

There was also evidence of some experiences of user-friendly interface design in digital healthcare services. Customers experienced that graphics is helpful for self-expression (Anttila et al., 2020). Other studies have shown that the overall process of healthcare access become easier if the functionality of digital service is easy and pleasant for the user (Simola et al., 2023; Anttila et al., 2020; Eriks-son-Backa et al., 2021). Some users have also noted the pleasant visual content of digital healthcare services (Anttila et al., 2020; Virtanen et al., 2021). With reference to useful content in digital healthcare services, customers expressed satisfaction when the content of digital healthcare service was suited for the correct user group and the expression of the information was easily understandable (Anttila et al., 2020).

To continue, trustworthiness of digital healthcare solutions was discussed in a few studies. Two studies have mentioned customers' experience that digital healthcare services not only allowed them to take care of health-related concerns but also worked as a source of reliable information (Virtanen et al., 2021; Anttila et al., 2020). One study pointed out the experience of customers that digital healthcare solution is safe to use (Anttila et al., 2020).

Referring to the ability of digital healthcare services to save customers' money and time, two studies pointed out that taking care of health-related concerns saves customers' time and travel cost by reducing unnecessary personal visits to the healthcare provider (Tolvi et al., 2023; Virtanen et al., 2023). Customers have also mentioned that the fee for digital healthcare service was smaller than for face-to-face visits (Tolvi et al., 2023).

The empowerment and autonomy thematic category relate to the degree of control over treatment plan, as well as features that enable customers of healthcare to have a better acknowledgement of their own situation and have easy access to information. The codes and subcategories for this thematic category are presented in Table 9.

Easier self-and treatment plan management	Easy access to information
Sense of freedom	Ability to monitor health information and track values over time
Sense of security	Ability to view access logs for user records
Healthcare professional notes as a support tool	Fast access to health information
Promotion of active involvement in care	Reliable health information in one place
Reminders as a support tool	Eliminates the need for paper-based health records
	Ability to gain insights into personal health and healthcare providers' perspectives through digital health information

Table 9. Empowerment and autonomy

With reference to digital healthcare service features allowing easier self- and treatment plan management, there was a mention in one study that customers have experiences a sense of freedom because digital healthcare services provided them with the opportunity to spend as little time as possible with concerns around health care and access needed healthcare services independently from place and time (Viitala et al., 2021). The same study finds that customers gained a sense of security through the ability to reach healthcare services whenever needed and control treatment related symptoms (Viitala et al., 2021). Moreover, professionals' notes in digital healthcare services supported remembering health information and kept healthcare customers up to date with their own treatment plan (Kujala et al., 2022; Simola et al., 2023; Viitala et al., 2021). Health information in healthcare professionals' notes ensured accuracy and clarity between healthcare provider and customer (Kujala et al., 2022).

Furthermore, with reference to digital healthcare services' features allowing easier self- and treatment plan management, digital healthcare services have been seen as a promotion tool of active involvement in care by providing customers with the ability to self-monitor and treat symptoms (Virtanen et al., 2023; Viitala et al., 2021). Assessment questionnaires provided customers with the sense of importance as accepting symptom assessment questionnaires provided customers with a feeling that healthcare provider is showing interest in their wellbeing (Viitala et al., 2021). Same study has also mentioned that digital healthcare services provided customers with the opportunity to take part in treatment decision making as well as some services allowed customers to share their personal experience with the ones who needed it (Viitala et al., 2021). The role of reminders as a support tool for healthcare customers utilizing digital healthcare services have been mentioned in one study. According to this study, reminders were experiences by customers as a helpful feature in remembering things and were not perceived as disruptive in customers' daily routine (Anttila et al., 2020).

Talking about digital healthcare services' features allowing easy access to information, there was a mention in several studies that digital healthcare services provide healthcare customers with the possibility to monitor health related information when it was needed as well as track health related values over time (Eriksson-Backa et al., 2021; Viitala et al., 2021; Simola et al., 2023). Digital healthcare services have also allowed healthcare customers to see who has assessed their health records and when (Eriksson-Backa et al., 2021). Furthermore, healthcare customers have appreciated getting fast access to health information through digital solutions (Pakarinen et al., 2022; Virtanen et al., 2023; Simola et al., 2023). According to several studies, some digital healthcare services provide access to reliable information in one place which is experienced valuable (Eriksson-Backa et al., 2021; Kujala et al., 2022; Virtanen et al., 2023). Using digital healthcare services eliminated the need of healthcare customers to store health information in paper format (Simola et al., 2023). Finally, reading health information through digital healthcare services have been found helpful by healthcare customers in understanding their health condition and healthcare providers' perceptions of situation (Kujala et al., 2022; Viitala et al., 2021; Karisalmi et al., 2019).

Lastly in user-centric design of digital healthcare services theme, community engagement and interaction thematic category refers to the social aspect of the user experience. It describes features of digital healthcare services that alleviate loneliness and improve customers' interaction with healthcare professionals. The codes and subcategories for this thematic category are presented in Table 10.

Alleviate loneliness	Improving interaction with healthcare professional
Social networking through digital healthcare services	Possibility to connect with healthcare professional in comfortable way
Connection to the healthcare professional through video consultation	Possibility to give feedback
	Possibility to contact familiar professional
	Possibility to prepare for the next appointment
	Possibility to spot errors and omissions
	Supported optimal self-expression

Table 10. Community engagement and interaction

## 6.2 Challenges and concerns of digital healthcare services users

This section of the thesis focuses on challenges and concerns describing various obstacles in use of digital healthcare services that affect the user experience of healthcare customers. This theme combines three thematic categories including: operational challenges, digital engagement challenges, and knowledge and competency concerns. Table 8 provides a visual presentation of challenges and concerns awakened by the experience of digital healthcare services.



Operational challenges	Digital engagement challenges	Knowledge and Competency concerns
Technical issues behind the services	Facelessness and lack of physical contact	Lack of access to information
Security and privacy concerns	Insufficiency in online service	Lack of trustworthiness
Device issues and application problems	Lack of sense of freedom	Lack of competence in using service
Legal challenges		No value
Insecurity about system		

Table 8. Challenges and concerns of digital healthcare services.

The subsection of operational challenges refers to obstacles encountered by healthcare customers when interacting with digital healthcare services due to technical issues behind services, security and privacy concerns, device issues and application problems, legal challenges, and insecurity about system. Table 9 provides a visual presentation of operational challenges.

Technical issues behind the service	Security and privacy concerns	Device issues and application problems	Legal challenges	Insecurity about system
Layout of the digital service was not helpful in understanding the content	Data protection concerns	Voice quality in digital services	Low age limit for parental access to children's record	One digital service overlapping another one
Unclear structure of the digital service, instructions, and navigation	Hard to build trust with participants of online meetings	Picture quality in video connection		Feeling that digital service is developed mainly for healthcare professionals
Symptom options are not right to describe health concern	Privacy concerns	Challenges with electronic identification		
Absence of interactivity		Services are challenges to use on smartphones		
Interruptions in the work of digital services		Lack of appropriate devices for successful use of digital services		
Lack of integration among different digital services				

Table 9. Operational challenges

According to several studies, layout of the digital service, such as visual contest was not helpful in understanding the content (Anttila et al., 2020; Tolvi et al., 2023). Even more studies were pointing out that healthcare customers experienced unclear structure of the digital service, instructions, and navigation as challenging while using digital healthcare services (Anttila et al., 2020; Tolvi et al., 2023; Eriksson-Backa et al., 2021; Simola et al., 2023; Viitala et al., 2021; Kujala et al., 2022; Virtanen et al., 2021). There was a mention in one study that symptom options of digital healthcare services are sometimes not right to describe health concern (Viitala et al., 2021). Healthcare customers have been experiencing interruptions in the work of digital services (Simola et al., 2023; Karisalmi et al., 2019). According to other study, customers have been mentioning lack of integration among different digital services (Simola et al., 2023).

Talking about security and privacy concerns, according to five studies, healthcare customers have been experiencing data protection concerns while using digital

healthcare services (Virtanen et al., 2021; Eriksson-Backa et al., 2021; Virtanen et al., 2023; Kainiemi et al., 2022; Simola et al., 2023). One study has mentioned that healthcare customers have experienced that it was hard to build trust with participants of online meetings in comparison with face-to-face group meetings (Virtanen et al., 2021). Three studies pointed out that healthcare customers had privacy concerns (Virtanen et al., 2021; Eriksson-Backa et al., 2021; Tolvi et al., 2023).

To continue, customers of digital healthcare services have been experiencing device issues and application problems. One example is challenges with voice quality in digital services (Virtanen et al., 2021). Other studies have mentioned challenges with picture quality in video connection, challenges with electronic identification and challenges to use services on smartphone (Virtanen et al., 2021). Several studies have mentioned that healthcare customers have shared lack of appropriate devices for successful use of digital services (Virtanen et al., 2023; Tolvi et al., 2023; Karisalmi et al., 2019). One study has mentioned healthcare customers experiencing legal challenges like low age limit for parental access to children's record (Eriksson-Backa et al., 2021).

Talking about healthcare customers' insecurity about system of digital healthcare services, two studies have mentioned about one digital service overlapping another one (Eriksson-Backa et al., 2021; Simola et al., 2023). According to two studies, some healthcare customers have experienced the feeling that digital service is developed mainly for healthcare professionals (Eriksson-Backa et al., 2021; Machal & Värri, 2022).

Next, digital engagement challenges relate to obstacles hindering healthcare customers' interaction with healthcare provider through digital healthcare services. These challenges include impersonal healthcare experience and lack of sense of freedom while using digital healthcare service. Table 10 provides a visual presentation of digital engagement challenges.

Impersonal healthcare experience	Lack of sense of freedom
Facelessness and lack of physical contact	Long waiting time for accessing digital service
Lack of individual approach	Inability to get access to healthcare digital service within working hours
Abstract medical assistance	

Table 10. Digital engagement challenges.

Proceeding with the focus on impersonal healthcare experience, one study has mentioned that healthcare customers have been experiencing facelessness and lack of physical contact in interactions through digital healthcare services as well as lack of individual approach (Virtanen et al., 2021). Eight studies have mentioned healthcare customers experiencing abstract medical assistance. Healthcare customers have been feeling like their service needs are too complex for digital service performance. (Virtanen et al., 2021; Virtanen et al., 2023; Anttila et al., 2020; Tolvi et al., 2023; Eriksson-Backa et al., 2021; Simola et al., 2023; Pakarinen et al., 2022; Viitala et al., 2021.)

To continue, there were also few mentions about lack of sense of freedom in interaction with digital healthcare services. According to one study, healthcare customers have experienced long waiting time for accessing digital healthcare services like callback and chat service (Virtanen et al., 2021). Several studies have mentioned that healthcare customers have experienced challenges in accessing services within working hours (Virtanen et al., 2021; Viitala et al., 2021).

Knowledge and competency concerns conclude theme of challenges and concerns. It encompasses challenges arising from lack of access to health-related information through digital healthcare services, lack of trustworthiness, lack of individual competence in using digital healthcare services and lack of value for the healthcare customer. Table 11 provides a visual presentation of knowledge and competency concerns.

Lack of access to information	Lack of trustworthiness	Lack of competence in using service	Lack of value
Delays in access to professionals' notes	Errors in information in notes	Lack of individual digital skills	Digital service was not found helpful
Lack of full access to own information	Differences in notes' information and customer experience	Using digital services requires high effort	Too busy to use digital service.
Missing information	Irrelevant information in professionals' notes	Difficulty in understanding the notes and medical terminology.	
Lack of interoperability between digital health records	Lack of up-to-date data		

Table 11. Knowledge and competency concerns.

Discussing lack of access to information in digital healthcare services, two studies have mentioned that healthcare customers have experienced delays in access to professional's notes (Kujala et al., 2022; Simola et al., 2023). According to other studies, healthcare customers have experienced lack of full access to their own information (Eriksson-Backa et al., 2021). Additionally, one more study mentioned that healthcare customers have experienced missing information while using digital healthcare services (Simola et al., 2023). One study pointed out on healthcare customers' experience of lack of interoperability between health records as lack of data exchange between digital healthcare services (Eriksson-Backa et al., 2021).

Secondly, there were few mentions about lack of trustworthiness in digital healthcare services. Three studies talked about healthcare customers' experience of errors in information in professionals' notes such as wrong diagnosis or even other person's information in healthcare customers' data (Kujala et al., 2022; Eriksson-Backa et al., 2021; Simola et al., 2023). One study has mentioned that healthcare customers have experienced differences in professionals' notes and what they have experience from the contact by themselves (Kujala et al., 2022). Two studies pointed out that healthcare customers have found irrelevant information in professionals' notes (Kujala et al., 2022; Simola et al., 2023). One

study has mentioned that healthcare customers have talked about lack of up-to-date data in digital healthcare services (Karisalmi et al., 2019).

Thirdly, some studies have been pointing out healthcare customers' experiences of lack of competence in using digital healthcare services. According to five studies, healthcare customers have been sharing their concerns about lack of individual digital skills for the successful use of digital healthcare (Simola et al., 2023; Virtanen et al., 2023; Virtanen et al., 2021; Kainiemi et al., 2022; Eriksson-Backa et al., 2021). Five studies have been pointing out that healthcare customers have been experiencing that using digital healthcare services requires high effort (Virtanen et al., 2021; Virtanen et al., 2023; Karisalmi et al., 2019; Eriksson-Backa et al., 2021; Tolvi et al., 2023). Four studies have been sharing healthcare customers' concerns about difficulty in understanding professionals' notes and medical terminology used in digital healthcare services (Kujala et al., 2022; Eriksson-Backa et al., 2021; Pakarinen et al., 2022; Simola et al., 2023).

Lastly, few studies have been sharing healthcare customers' experiences about lack of digital healthcare services' value. As an example, four studies have mentioning healthcare customers' experiences that digital healthcare services were not found helpful for their health situation (Virtanen et al., 2023; Tolvi et al., 2023; Viitala et al., 2021; Anttila et al., 2020). One study has mentioned that healthcare customers were too busy to use digital healthcare services (Tolvi et al., 2023).

### 6.3 Opportunities for improvement in digital healthcare services

This section explores opportunities for improvement in digital healthcare services provide examples from healthcare customers' experiences of potential changes that could be made in digital healthcare to enhance user experience. Results collected from research data are combined into three thematic categories including information accessibility and clarity, effective communication and engagement,

and data relevance and integration. Table 12 represents a visual presentation of opportunities for improvement in digital healthcare services.

Information Accessibility and Clarity	Effective Communication and Engagement	Data Relevance and Integration
Basic Functionality and Navigation	User Interaction and Support	Health Information Management
Enhanced User Engagement	Information and Support Services	Technological Solutions and Accessibility

Table 12. Opportunities for improvement in digital healthcare services

Information accessibility and clarity thematic category focuses on foundational elements of user experience including basic functionality and navigation in digital healthcare services and engagement with the digital platform. Table 12 represents a visual presentation of opportunities for improvement in digital healthcare services' information accessibility and clarity.

Basic Functionality and Navigation	Enhanced User Engagement
Easier affordability	Graphs for monitoring in Kanta
Layout of Kanta	More interactivity
Navigation in Kanta	Reminders and notifications
Easier usability of digital services and video call	Personalized appearance of information
Easier service accessibility online and at any time	Safety to use in sensitive matters

Table 12. Opportunities for improvement in information accessibility and clarity.

To begin from the opportunities for improvement of basic functionality and navigation of digital healthcare services, according to one study, healthcare customers brought up their hopes for easier affordability of digital healthcare (Karisalmi et al., 2018). Another study shared healthcare customers' suggestion for the improvement of Kanta layout and navigation:

*“[. . .] some bar chart there, like it would be based on the appointments so that you could see if [the values] rise or drop”,*

*“[. . .] you, for example, look at the diagnoses, that you go to that section. If you want to have the next diagnosis you must return to the diagnosis main menu [. . .] so I don’t think that works”. (Eriksson-Backa et al., 2021.)*

One study has shown that healthcare customers expressed their hope for easier usability of digital healthcare services and consultations through a video call (Virtanen et al., 2021). Two studies pointed out that healthcare customers have expressed their hopes for easier healthcare service accessibility online and at any time (Karisalmi et al., 2018; Virtanen et al., 2021).

To continue with the opportunities for enhancement of user engagement in digital healthcare services, one study has shown that customers of digital healthcare services expressed their suggestion to include graphs for monitoring to Kanta services:

*“[. . .] a bar graph, some kind of table if you for example aim at lowering a value that like . . .”,*

*“[. . .] this kind of personal health record and there you can find everything, that which vaccinations you have had and which years and what should be renewed, so that would be brilliant”. (Eriksson-Backa et al., 2021.)*

Three studies have shared healthcare customers’ suggestions for more interactivity in digital healthcare services like having personal contact with medical professional, booking appointments, being able to leave feedback on professionals’ notes or renewed prescriptions (Simola et al., 2023; Kujala et al., 2022; Eriksson-Backa et al., 2021). As an example, healthcare customers have expressed their hope to have possibility to comment professionals’ notes with which they were not agreeing:

*“People should have possibility to say their views on My Kanta” (Kujala et al., 2022).*

Another example has been given about healthcare customers’ need to share their personal knowledge with healthcare provider digitally:



*“[. . .] a section where you could, like, yourself add some information like when you for example have taken a vaccination sometimes you can add the date, that you could gather kind of your own archive there” (Eriksson-Backa et al., 2021).*

Two studies have shared healthcare customers' suggestions to include reminders and notifications to digital healthcare services (Kujala et al., 2022; Simola et al., 2023). As example, customer of digital healthcare service shared the need to get notifications about laboratory test results:

*“When you're waiting for some laboratory results, you have to go and see what's going on many times when there's no system where you can order a notification when the information is updated” (Simola et al., 2023).*

One study brought up healthcare customers' suggestions for enhanced personalization of appearance of information in digital healthcare services:

*“[. . .] personalization of the browser [. . .]. The appearance is quite boring. And the fonts are small” (Eriksson-Backa et al., 2021).*

One more study have shown that healthcare customers' have expressed their need to feel safety while bringing up sensitive matters in digital healthcare services (Virtanen et al., 2021).

Secondly, effective communication and engagement category addresses the aspects to enhance customer support and effective interaction between healthcare provider and healthcare customer as well as aspects that can enhance the work of support services and provision of relevant information to customers. Table 13 represents a visual presentation of opportunities for improvement in effective communication and engagement through digital healthcare services.

User Interaction	Information expression and exchange
Better communication and guidance from medical professionals	More detailed notes
Well-coordinated peer support for users and family members	Integration with other services
Video connection for the visit	

Table 13. Opportunities for improvement in effective communication and engagement.

To begin with opportunities to improve user interaction in digital healthcare services, two studies have shown that healthcare customers have a need for proper communication and guidance from medical professional (Karisalmi et al., 2018; Eriksson-Backa et al., 2021). As an example, digital healthcare services' customer has been seeking for care instructions in sensitive life situations:

*“What I was trying to find there when I was going to undergo a small surgery was that there would have been, like, care instructions”* (Eriksson-Backa et al., 2021).

Another study brought up digital healthcare services' customers' need for well-coordinated peer support for users and family members (Karisalmi et al., 2018). Another study has shown that digital healthcare services' customers were hoping to get an opportunity to access video connection for the digital healthcare visit (Tolvi et al., 2023).

Discussing opportunities to enhance information expression in digital healthcare services and exchange of information between different healthcare services, two studies have expressed digital healthcare services' customers' need for more detailed professionals' notes (Kujala et al., 2022). Another study brought up digital healthcare services' customers' need for improvement in integration with other digital healthcare services:

*“[. . .] it would be good that it [My Kanta] would communicate with the insurance people”,*

*“This municipal [dental health information] is not available in My Kanta [. . .] I have checked”.* (Eriksson-Backa et al., 2021.)

Lastly, opportunities to improve data relevance and integration in digital healthcare services focus on the features that may enhance management of health-related data within the digital healthcare service and provides the examples of technological features and solutions implemented within the digital healthcare service to enhance accessibility for users. Table 14 represents a visual presentation of opportunities for improvement in data relevance and integration.

Health Information Management	Technological Solutions and Accessibility
Specific information about vaccinations	My Kanta as mobile app
More complete information	Information for certain age groups
Information about blood group, allergies, and haemoglobin level	
Possibility to remove information	
Information about shared health information	

Table 14. Opportunities for improvement in data relevance and integration.

Proceeding with opportunities for improvement of health information management, one study has shared digital healthcare services’ customers’ need to get access to more specific information about vaccinations in health records:

*“[. . .] this vaccination thing so that is actually better if it is electronic because if you don’t have the card with you when you go and take a shot”* (Eriksson-Backa et al., 2021).

Two studies have mentioned that digital healthcare services’ customers have expressed the need to get access to more complete healthcare information through digital healthcare services (Eriksson-Backa et al., 2021; Simola et al., 2023). As an example, there was a mention in one study about the need of the digital healthcare services’ customers to get access to information about mammograms:

*“- but are they in My Kanta these mammograms?” “- no, that’s what they aren’t [ . . .]”* (Eriksson-Backa et al., 2021).

Another study presented the need of digital healthcare services’ customers to include additional information to prescription renewal request:

*“Additional information cannot be written in the prescription renewal request, which creates unawareness for the doctor and may lead to rejection of the prescription”* (Simola et al., 2023).

There was a mention in one study about healthcare customers’ hopes to get access to information about blood group, allergies, and haemoglobin level through digital healthcare services (Eriksson-Backa et al., 2021). Another study described healthcare customers’ hopes to get a possibility to remove information from healthcare records through digital healthcare services:

*“Is it significant that a 15-year-old has had an abortion or the like anymore when she is 40, that could this file be like cleaned?”* (Eriksson-Backa et al., 2021).

Additionally, one study has shared digital healthcare services’ customers’ need to get access to information about shared personal health information:

*“For example, to whom the information has been disclosed. It could be possible to see immediately to whom, for what purpose, when, and at what time, etc.”* (Simola et al., 2023).

Finalising results section with opportunities for improvement in technological solutions and accessibility in digital healthcare services, one study brought up suggestion of My Kanta customers that the service would be also available as mobile app because of solution convenience in individuals’ daily life (Eriksson-Backa et al., 2021). Same study pointed out healthcare customers’ suggestion to add targeted information for certain age groups into digital healthcare services:

*“[. . .] if you are like fifty, that then it would send you something like ‘hello, have you checked your health’, that kind of reminder” (Eriksson-Backa et al., 2021).*

## 7 RESULTS OF THE STUDY IN VIDEO RECORDING

The results of the study have been presented in a video format to enhance the usability of thesis results. A six-minute lecture discussing the thesis results was video-recorded in Finnish language to present the study findings to nursing students and other working professionals in the social- and healthcare field through the online course on the Diak open university platform. To ensure accessibility, accompanying text was agreed upon to be provided alongside the recording in PDF file. Video lecture recording link: [UX OF DIGITAL HEALTHCARE SERVICES IN FINLAND FROM THE CUSTOMER PERSPECTIVE\(youtube.com\)](https://www.youtube.com/watch?v=UX_OF_DIGITAL_HEALTHCARE_SERVICES_IN_FINLAND_FROM_THE_CUSTOMER_PERSPECTIVE)

Video recording script:

(Opening Shot: Me sitting in my home office setup with a comfortable background. I begin speaking directly to the camera.)

“Hei! Millaisia kokemuksia terveydenhuollon asiakkaila on digitaalisten terveysten palvelujen käytöstä? Tässä videossa navigoidaan tämän aiheen läpi. Kartoitetaan asiakkaiden mielipiteitä digitaalisten terveysten palvelujen suunnittelusta, asiakkaiden tuomat digitaalisten terveydenpalvelujen haasteet, sekä mahdollisuudet parantamiseen. Toivon, että tämä video lisää ymmärrystä digitaalisten terveysten palvelujen merkityksestä terveydenhuollon asiakkaille.

Jakamani tieto perustuu YAMK-opintoihini liittyvään opinnäytetyöhön, jossa tarkastellaan vuosien 2016 ja 2023 välillä tehtyjen akateemisten tutkimusten tuloksia tarkoituksenaan tunnistaa asiakkaiden kokemuksia digitaalisten terveysten palvelujen käytöstä Suomessa. Tänään pääsemme käsittelemään eri teemoja ja kategorioita, jotka nousivat kattavasta aiheen katsauksesta.

Nimeni on Alena Komarova. Olen työskennellyt sairaanhoitajana vuodesta 2018 lähtien. Urani aikana olen tehnyt töitä erikoissairaanhoidossa, terveydenhuollon etäpalveluissa, sekä olen myös osallistunut kehittämistyöhön projektikoordinaattorina.”

(Transition to a slide showing the agenda for the presentation. I begin speaking looking to the computer.)

“Miksi on syytä keskustella aiheesta? Digitalisaatio on syvästi integroitunut terveydenhuoltoon Suomessa. Jatkuvat teknologiset edistysaskeleet tekevät tuotteista entistä monimutkaisempia ja haastavampia käyttää. Käyttäjäkokemuksen rooli laajenee merkittävästi nykytilanteessa koska se tuo lisää ymmärrystä käyttäjien vuorovaikutuksesta tuotteen kanssa.”

(Transition to a slide showing the agenda for the presentation. I begin speaking looking to the computer.)

“Terveydenhuollon asiakkaat toivat esille omat kokemukset toimivista digipalvelujen ominaisuuksista ja ne ovat esitetty diassa. Asiakkaat myös toivat esille digitaalisten terveystalveluiden saavutettavuuden ja saatavuuden merkityksen. Ominaisuudet, kuten digitaalinen reseptin uusiminen tai terveydenhuollon tai terveydenhuollon ammattilaisten merkinnän lukeminen ja hoitosuunnitelman katselu digitaalisten terveystalvelujen kautta, koettiin erityisen tärkeänä. Lisäksi mainittiin sähköisen ajanvarauksen ja chat-palvelun tehokkuus.”

(Transition to a slide showing the agenda for the presentation. I begin speaking looking to the computer.)

“Digitaaliset terveystalvelut mainittiin helpottavan terveystalveluiden saavutettavuutta. Terveydenhuollon asiakkaat arvostivat digitaalisten palvelujen joustavuutta ja kätevyyttä, jotka mahdollistivat heille pääsyn tarvittaviin terveystalveluihin paikasta ja ajasta riippumatta.”

(Transition to a slide showing the agenda for the presentation. I begin speaking looking to the computer.)

“Digitaaliset terveystalvelut koettiin hyödylliseksi terveys- ja hyvinvoinnin edistämisen, sekä sosiaalisen vuorovaikutuksen tueksi. Terveystenhuollon asiakkaat arvostivat mahdollisuutta käyttää terveystalveluita digitaalisesti, erityisesti silloin, kun fyysinen yhteydenotto oli syystä tai toisesta haasteellista. Kaikki nämä digitaalisten terveystalvelujen ominaisuudet koettiin hyödylliseksi myös terveystenhuollon asiakkaiden mielenterveyden tukemisessa.”

(Transition to a slide showing the agenda for the presentation. I begin speaking looking to the computer.)

“Digitaaliset terveystalvelut mainittiin muun mualla säästävän terveystenhuollon asiakkaiden aikaa ja vähentävän terveystenhuollon asiakkaiden kustannuksia. Terveystenhuollon asiakkaat kuitenkin tuonut esille digitaalisten terveystalvelujen toiminnalliset haasteet, osallistumishaasteet, sekä tieto- ja osaamishaasteet kuten esimerkiksi huolet tietosuojasta ja yksityisyyden luomisen haasteet digitaalisten terveystalvelujen käytön aikana.”

(Transition to a slide defining opportunities for improvement in digital healthcare services)

“Terveystenhuollon asiakkaat toivat esille oman näkemyksen kehittämismahdollisuksiin Suomen digitaalisissa terveystalveluissa. Terveystenhuollon asiakkaat ilmaisivat tarpeensa parannuksesta selkeän terveystiedon saattavuuteen, toivonut parannusta kommunikatioon terveystenhuollon ammattilaisen kanssa ja oman osallistumiseen, sekä tuonut esille tarve terveystiedon saattavuuden parantamiseen kaikissa digitaalisissa terveystalveluissa.

Esimerkkinä digitaalisten terveystalvelujen parannuksista on ollut graafisten seurantatyökalujen lisääminen digitaalisiin terveystalveluihin, sekä muistutusten ja ilmoitusten käytön lisääminen. Terveystenhuollon käyttäjät ovat toivonut

digitaalisten terveystietopalvelujen personalisointia ja lisäksi myös saattavuutta mobiilisovelluksen muodossa.

Terveystietopalvelun käyttäjät toivoivat selkeämpää ja laajempaa terveystietoa terveystietopalvelun ammattilaisen merkinnöissä ja myös toivonut parannettua terveystiedon vaihtoa eri digitaalisten terveystietopalvelujen välillä.”

(Closing Shot 1: Me sitting in my home office setup with a comfortable background. I begin speaking directly to the camera.)

“Yhteenvetona täytyy sanoa, että Suomen terveystietopalvelun digitaalisissa palveluissa on sekä toimivia ratkaisuja, että parannusta tarvitsevia alueita asiakkaiden näkökulmasta. Kerättyjen tietojen tarkastelu oli mielenkiintoista ja sillä havaittiin, että ajan kanssa oli tehty monia muutoksia digitaalisissa terveystietopalveluissa, jotka vastaavat terveystietopalvelun asiakkaiden tarpeisiin. Oppimalla lisää käyttäjäkokemuksesta terveystietopalvelun asiakkaiden näkökulmasta ja kohdennetusti tekemällä parannuksia voi varmistaa, että terveystietopalvelun digipalvelut vastaavat asiakkaiden tarpeisiin.”

(Closing Shot 2: Me sitting in my home office setup with a comfortable background. I begin speaking directly to the camera.)

“Kiitos osallistumisestasi ja toivottavasti tämä esitys on herättänyt ajatuksia asiakkaiden näkemyksistä digitaalisista terveystietopalveluista, sekä käyttäjäkokemuksen merkityksestä palvelujen kehittämisessä.”

(End of video)



## 8 ETHICS AND RELIABILITY OF THE RESEARCH

The guidelines of the Finnish Advisory Board on Research Integrity (TENK), which is appointed by The Ministry of Education and Culture in Finland were reviewed to define the ethical limitations of responsible conduct of research and writing this thesis work. The guidelines were used to minimize situations of violation of conduct and risk to the successful conduct of the research. Finally, guidelines provide information about handling possible violations with competence, fairness, and expediency. (Integrity 2019.)

The thesis work was obtained through the literature review. In this way, the research was not conducted with human participants or the personal information of individuals. Despite that fact, the protection of the privacy of individuals who are mentioned in the publications used in the literature review were respected and followed during the research process. Respectful expression was used while analysing the data and writing the results. (Integrity 2019.)

Topic area approval was granted by the university supervisors before the beginning of the research process. The idea paper included the desired topic area of the thesis, purpose, and aim, as well as a preliminary description of the research topic, benefit of the thesis for working life, preliminary schedule, and PICO research question. Regarding the environment for the thesis, work communities, and apartments, it was agreed to perform the thesis work for Diak as a working life partner. The critical appraisal was performed with the university student in accordance with JBI guidelines.

The process of data collection and data analysis is presented transparently. Methods of data collection included several official databases. Keywords and limitations were chosen before the conduct of the research to ensure the relevancy of the collected data. (TENK.)

The thesis work is oriented toward research and is performed systematically as a descriptive literature review. Results are presented in a qualitative way.

Regarding the supervision matters, thesis supervisors from the university agreed before starting the thesis work. The researcher was responsible for the research process and seeking the needed supervision. Plagiarism matters, copyright legislation, and processing of suspected RCR violations were acknowledged before the conduction of the research (TENK.)

To increase the credibility of the research, prolonged engagement was used from the very start of the process. The preliminary literature search with the university librarian was conducted to make clear the theoretical support of the research topic. It was found that with the current search words, there are difficulties finding the necessary number of articles and the idea of widening the research problem was considered. Prolonged engagement and background search were used to improve the credibility of the research topic and thesis results.

## 9 DISCUSSION

Future healthcare focuses on customer active involvement and digital transformation of services (Stoumpos et al., 2023). The importance of user experience is increasing in accordance with product becoming more challenging to use. Increasingly diverse user groups accompany technological development. Studying user experience is helpful in enhancing understanding of how users interact with a product by collecting insights into individuals' personal experiences with it. (Albert & Tullis, 2013.) The thesis reviews existing research studies with the purpose to examine the encounters that customer users in Finland have had with digital healthcare platforms. The thesis aims to develop a descriptive report describing the main aspects of user experience that existing studies of digital healthcare platforms have revealed. The thesis also aims to describe the sources of user experience of digital healthcare platforms. Collected information provides students and other working social- and healthcare professionals in the field participating in online course of Diak open university platform with the latest knowledge

about the matter. It also gives a solid foundation for developmental work on customer acquisition processes in healthcare of Finland as well as customers' feedback collection and analysis matters.

The thesis highlights both useful features and areas of improvement in digital healthcare services in Finland, reflecting a broad landscape of user experience from healthcare customers' experience. On one hand, healthcare customers using digital healthcare services valued the convenience and efficiency of digital healthcare services, which provided the ones with valuable features like digital prescription renewal and access to personal health information through healthcare professionals' notes and laboratory results. Digital healthcare services were found as a successful tool for active healthcare customers' involvement in care, empowering the ones for personal health management, and facilitating effective interaction and communication between healthcare customers and healthcare providers.

However, the studies discussed also describe healthcare customers encountering various challenges and concerns when using digital healthcare services. Issues with digital healthcare services' layout and navigation affected usability experience of healthcare customers, while security and privacy concerns decrease trust in digital healthcare services. Technical issues, legal challenges, and difficulties with interaction in digital healthcare services also affect the user experience from healthcare customer perspective, leading to healthcare customers' frustration and doubts in their personal ability to use healthcare services digitally.

The thesis describes healthcare customers' suggestions for improvements in digital healthcare services in areas like affordability, usability, and accessibility. User engagement may be enhanced through interactive features, personalisation in presentation of information on digital healthcare services' platform, and improvement in communication with healthcare provider digitally. Moreover, effectiveness and user-friendliness of digital healthcare services may be improved through ensuring comprehensive health data exchange between different digital healthcare platforms and between customer and healthcare provider in digital settings.

As governmental programs of Finland aim to meet the healthcare needs of diverse user groups, they strive to ensure the user-friendly digital healthcare services and equal access to the right services for everyone including digital healthcare services, access to in-person appointments and phone services when needed (The Finnish Government, 41). Reviewing the collected data, it was interesting to see that variety of changes in digital healthcare services have been already made meeting healthcare customers' needs. By learning more about user experience from healthcare customers' experience and implementing targeted improvements, digital healthcare services have an opportunity to better meet the diverse needs of users, improve trustworthiness and customers' engagement in personal health management, and ultimately, enhance the delivery of healthcare digitally.

Despite the comprehensive overview of the subject, this thesis has certain limitations. Firstly, the thesis focuses on limited number of academic articles published between 2016-2023. Secondly, the thesis findings rely on academic sources excluding the customers' feedback data collection from local healthcare providers of Finland. Both may not capture all the insights from healthcare customers' experiences about using recent digital healthcare services, potentially limiting the generalizability of thesis findings. Further research into recent insights about user experience of digital healthcare services in Finland from the customer perspective has the potential to enhance understanding of the current needs of healthcare customers.

Next, there was a limited number of academic studies available for data analysis, thus both qualitative and quantitative type of data was included which made data extraction and analysis challenging. The selection of articles and extraction of data for data analysis may be also influenced by biases or my personal subjective interpretations. All of the non-English language sources used in this thesis are translated from Finnish to English by me, which may also influence thesis findings.

Lastly, the thesis provides an overview of user experience of digital healthcare services in Finland from the customer perspective on a general level without

exploring specific nuances of each distinct type of digital healthcare service. Considering these limitations, it is essential to recognize the need for further research to expand the provided insights. Furthermore, future studies may conduct comparisons between thesis results and knowledge from the healthcare personnel perspective to enrich understanding of user experience and highlight developmental needs.

## 9.1 Recommendations

This thesis highlighted various needs for development work in digital healthcare services. Development work on digital healthcare services can be done to address the identified challenges and enhance user experience. To begin with, digital healthcare service customers expressed hopes for improving of layout and navigation of digital healthcare services, in particular, there is a need for usability of video consultations to be enhanced. Digital healthcare service customers proposing features like graphical monitoring tools, interactive elements for appointments and feedback, and personalized information presentation.

Improving digital healthcare service customers' interaction, ensuring clearer communication and guidance from medical professionals in detailed professionals' notes as well as providing peer support and opportunity for switching consultation to video connection is needed. Importance of informational exchange and integration between different digital healthcare services is highlighted. Digital healthcare service customers also express their need for additional features like blood group information, the ability to remove outdated information, and transparency regarding sharing customers' personal health information. Lastly, availability of digital healthcare services in the form of mobile applications and targeted information for different age groups are suggested as opportunities for further development of digital healthcare services.

Conducting data analysis, prevalence of quantitative data was noticed in academic sources. However, qualitative articles with the examples of digital healthcare services' customers' quotes from interviews bring more comprehensive insights about user experience of digital healthcare services in Finland from the customer perspective. To enhance overall quality of healthcare provided digitally, future research could focus on collecting more qualitative data about research matter especially focusing on specific nuances of each type of digital healthcare service in Finland.

## 9.2 Development of expertise

The knowledge gained through this literature review can be utilised in social-and healthcare education and in induction process for new healthcare personnel. Additionally, the knowledge of the review can be beneficial for healthcare personnel working with the customer service. Staying up to date with the latest research about the matter allow healthcare personnel to understand healthcare customer needs and to provide better guidance for them enhancing their user experience.

Conducting a comprehensive review of existing literature on the user experience of digital healthcare services in Finland from the customer perspective can be beneficial for gathering foundation knowledge for future developmental work in healthcare sector. This includes developmental work with the processes related to the customer acquisition in healthcare. Use of insights provided by this thesis can give directions and inspiration for targeted improvements in digital healthcare services.

In conclusion, this thesis work yields knowledge that can be applied in healthcare work and education. Moreover, it offers valuable insights for healthcare professionals involved in the customer service, enabling them to better understand and address the needs of customers in digital healthcare. Finally, findings from this

literature review can clarify the needs for developmental work in digital healthcare services and guide developmental processes.

Conducting this literature review, I have built better understanding of the chosen subject. Through this thesis process I have enhanced my proficiency in conducting literature review and literature search. This process has developed my analytical capabilities, critical thinking skills and proficiency in effectively reporting findings, thereby strengthening my performance as a professional working with developmental work of healthcare customer acquisition processes. The thesis process refined my time management and academic writing skills, contributing significantly to my personal growth and development.

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## APPENDIX 1. JBI Critical Appraisal Checklist

## JBI CRITICAL APPRAISAL CHECKLIST FOR QUALITATIVE RESEARCH

Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Author \_\_\_\_\_ Year \_\_\_\_\_ Record Number \_\_\_\_\_

Yes No Unclear Not  
applicable

1. Is there congruity between the stated philosophical perspective and the research methodology? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
2. Is there congruity between the research methodology and the research question or objectives? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
3. Is there congruity between the research methodology and the methods used to collect data? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
4. Is there congruity between the research methodology and the representation and analysis of data? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
5. Is there congruity between the research methodology and the interpretation of results? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
6. Is there a statement locating the researcher culturally or theoretically? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
7. Is the influence of the researcher on the research, and vice-versa, addressed? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
8. Are participants, and their voices, adequately represented? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data? ☐ Yes ☐ No ☐ Unclear ☐ Not applicable

Overall appraisal:    Include ☐    Exclude ☐    Seek further info ☐

Comments (Including reason for exclusion)

## APPENDIX 2. Summary table

Author(s)	Title	Year of publication	Source and the country	Aims and purpose.	Methods	Sample	Key findings related to the review question.
Lotta Virtanen, Anu-Marja Kaihlanen, Anna-Maria Isola, Elina Laukka, Tarja Heponiemi	Mielenterveyskuntoutujien kokemuk- sia etäpalveluiden hyödyistä COVID-19 aikakaudella: Laa- dullinen kuvaileva tutkimus.	2021	Medic,	Article aims to de- scribe how com- munication ser- vices and digitally performed social- and health services supported mental health rehabilita- tion during the out- break of COVID- 19.	Descriptive qualitative study	12	Digital services were found beneficial for their users despite the challenges in usability. Negative effects of COVID-19 outbreak were possibly eased by digital services by supporting the mental health of the one participat- ing rehabilitation and bringing ease to the sense of loneliness. There is a big potential for use digital services within different age groups as well as there is a gap for further development.
Katriina Ant- tila, Minna Ant- tila, Maritta Välimäki	A web-based ado- lescent depression support system: feedback and impli- cations for the future	2020	Medline	Article aims to de- scribe the experi- ence of adoles- cents on their use of a web-based	Mixed methods	46	The web-based support system was experienced, safe, reliable and tar- geted at users. It was found helpful for thoughts reflecting and support from

				depression support system.			home despite some difficulties in usability.
Marlon Luca Machal, Alpo Värri	Development towards Customer-Centered eHealth Services in Finland	2022	Medline	The article aims to analyze the perception of customer's experience over the development of public health services from 2014 to 2021.	Empiric survey/ semi-structured interview	351	The main finding was that all the features wanted by the customers had still not been implemented. The finding of this paper suggests that current Finnish public eHealth services are organizations oriented rather than the customer oriented.
Kristina Eriksson-Backa, Noora Hirvonen, Heidi Enwald, Isto Huvila	Enablers for and barriers to using My Kanta – a focus group study of older adults' perceptions of the National Electronic Health Record in Finland	2021	Medline	Article aims to review the experience of older adults of using Finnish national customer-accessible health record My Kanta and similar services to define how experiences with customer-accessible electronic health records correspond to the	Focus group	24	Developmental works causing launch-time lack of useful content and imperfections in systems can cause frustration and affect the usability rate at the time and in the long run. There was a prevalence in socio-techno-informational concerns and barriers related to the content of the system. Improved security, usability and additional information and functions, coherent and timely information from health-care providers available in the e-health services have a potential to increase the use of the service.

				expectations of the users.			
Nina Kari-salmi, Johanna Kaipio, Sari Kujala	Encouraging the use of eHealth services: A Survey of Customers' Experiences	2019	Medline	Explore how customers with chronic illnesses experience the use of eHealth services.	Mixed methods	397	Most of the participants have positive experiences of using eHealth services. Positive experience and perceived benefits worked as an encouragement for using the services. Information about new services and how to use them could motivate people to continue using the services. Healthcare professionals are seen important in introducing and guidance with new services.
Sakari Pakari-nen, Pirita Varpe, Anu Carpelan, Mari Koivisto, Heikki Huhti-nen	Mobile-CEA-A Novel Surveillance Method for Customers with Colorectal Cancer	2022	Medline	Analyze the novel mobile phone messaging-based system (Mobile-CEA) on subject of acceptability, convenience and how the use of the one impact the amount of customer contacts	Non-validated questionnaire/ interview	52	Mobile-CEA system was found effective but there is a need of further research to evaluate long term outcomes and cost effectiveness.



				to the health personnel.			
Anu Viitala, Paivi Åstedt-Kurki, Juho T. Lehto, Mira Palonen	Online follow-up with a mobile device improves incurable cancer customers' coping – A qualitative study	2021	Medline	To research the customer experience of how a connection through mobile device application supports customers in coping with incurable cancer.	Semi-structured face to face interviews	20	Mobile applications have helped customers to cope with the disease as it increased the customer's sense of security and freedom. Some customers reported the application to be too disease centered.
Saija Simola, Iiris Hörhammer, Yuhui Xu, Annika Bärkås, Asbjørn Johansen Fagerlund, Josefin Hagström, Mari Holmroos, Maria Häggglund, Monika Alise	Customers' Experiences of a National Customer Portal and Its Usability.	2023	Medline	This study aims to investigate opinions of users about the usability of national customer portal and the relation of positive and negative experiences to the usability.	Cross-Sectional Survey Study	4719	Customer's experience of national customer portal usability can be a valuable informational source for the continuous developmental work. There is a need to improve usability in order to provide customers with information efficiently, easily and quickly. Interactive features in the customer portal are the one way to improve usability experience.

Johansen, Bridget Kane, Anna Kharko, Isabella Scandurra, Sari Kujala							
Lotta Virtanen, Anu-Marja Kaihlanen, Emma Kainiemi, Petra Saukkonen, Tarja Hepo-niemi	Patterns of acceptance and use of digital health services among the persistent frequent attenders of outcustomer care.	2023	Medline	This study explores the patterns of acceptance among frequent service users and their use of digital health services.	A qualitatively driven semi-structured interview	30	Readiness to use among frequent users may vary, that is why it is important to access the suitability of frequent users to digital services. Professionals should promote digital health services to the correct potential users. Digital suitability can be improved by introducing more accessible digital services despite functional limitations.
Emma Kainiemi, Tuulikki Vehko, Maiju Kyytsönen, Iiris Hörhammer, Sari Kujala, Vesa Jormanainen,	The Factors Associated with Nonuse of and Dissatisfaction with the National Customer Portal in Finland in the Era of COVID-19.	2022	Medline	The study aims to investigate and describe the reasons of nonuse or dissatisfaction of the users of health care services with the Finnish	Population-Based Cross-sectional Survey	3919	Factors associated with nonuse of Finnish nationwide customer portal MyKanta include lacking chronic medical conditions, those not referred to electronic health services, those in need of assistance in using the service. Factors associated with the dissatisfaction with the service include

Tarja Hepo- niemi				nationwide cus- tomer portal My Kanta Pages dur- ing the COVID-19 outbreak.			poor health and security concerns. Electronic health services should be actively promoted and referred to by medical professionals. There is a need to bring more attention to the information security of the service and promotion of the public confidence in the safety of their private information.
Morag Tolvi, Lotta-Maria Oksanen, Lasse Lehto- nen, Ahmed Geneidion, Pia Männikkö, Hellevi Ruoko- nen, Anna Ma- jander, Susan Arminen, Leena-Maija Aaltonen	Virtual visits at the Helsinki Head and Neck Center during the COVID-19 pan- demic: customer safety incidents and the experiences of customers and staff.	2023	Medline	The study aims to explore the experi- ences and satisfac- tion of customers and staff of virtual visits at the Hel- sinki Head and Neck Center during the COVID-19 pan- demic.	Questionnaire on experiences and satisfaction	193	The goal of implementing telemedicine during COVID-19 outbreak was to ensure the customer treatment. Now there is a need to examine the usefulness of the one. Focus on the quality care must be kept while focusing new treatment protocols and performing evaluation of treatment pathways. Telemedicine has an opportunity to save resources such as environmental, temporal and monetary ones. Despite the usefulness of telemedicine, clinicians must have an opportunity for customer's clinical examination and treatment in person.

Nina Kari- salmi, Jo- hanna Kaipio, Pekka Lah- denne	Improving Customer Experience in a Chil- dren's Hospital: New Digital Services for Children and Their Families	2018	CINAHL	Following study aims to explore what kind of needs in digital services children and their families have in the context of a chil- dren's hospital in Finland.	Web-based sur- vey and video diaries	87	Nine categories of needs were identi- fied, and they all were related to the level of communication between fami- lies, healthcare professionals, and peers.
Sari Kujala, li- ris Hörham- mer, Akseli Väyrynen, Mari Holm- roos, Mirva Nättiaho- Rönholm, Maria Hög- glund. Monika Alise Johan- sen	Customers' Experi- ences of Web- Based Access to Electronic Health Records in Finland.	2022	CINAHL	The aim of the study was to iden- tify customers' ex- periences in terms of usability-related perceptions while using a national customer portal to access their elec- tronic health rec- ords, in particular benefits and chal- lenges of reading clinical notes	Cross-sectional Survey	3135	Self-management was supported by access to electronic health records. Medical notes provide information for customers to follow up professional's instructions for health care. The study showed that there is a need for im- provement in the quality and availabil- ity of medical notes. The use of infor- mational structure might be helpful for customers to find the needed infor- mation from the professional's note. Understanding of medical terminology might be improved by linking notes to vocabulary and other information sources. Allowing customers to

				written by medical professionals.			comment under the medical note can support stormy agency. Allowing customers to control the visibility of medical notes can improve the customer's trust in the system.
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### APPENDIX 3. Sources of Research Data

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