

UNDERSTANDING PATIENT PRIORITIES: FACTORS
INFLUENCING PATIENT SATISFACTION IN
TELEDERMATOLOGY

Master's Thesis
Emmi Kilpeläinen
Aalto University School of Business
Information and Service Management
Spring 2024

Author Emmi Kilpeläinen

Title of thesis Understanding Patient Priorities: Factors Influencing Patient Satisfaction in Teledermatology

Degree Master of Science in Economics and Business Administration

Degree programme Information and Service Management

Thesis advisor(s) Esko Penttinen & Merja Halme

Year of approval 2024**Number of pages** 56**Language** English

Abstract

Teledermatology is becoming an increasingly common treatment method for a variety of skin conditions. Previous research has found that patients express high overall levels of satisfaction with teledermatology. However, still relatively little is known about which aspects are most important in shaping the patient experience. This study delves into the realm of patient satisfaction in teledermatology, employing semi-structured interviews with individuals engaged in remote dermatologist consultations. The research is framed within the SERVQUAL framework in order to identify the factors that are considered most important by patients and to shed light on the dimensions that influence their satisfaction with teledermatology services. Preliminary questions, open-ended questions and SERVQUAL-derived assisted open-ended questions structure the interviews and allow for a nuanced exploration of patient experiences. By focusing on dimensions such as reliability, responsiveness, assurance, tangibles and empathy, the study seeks to identify patterns and priorities within patient perceptions of teledermatology. The findings highlight generally perceived high importance for all the dimensions, with a slight emphasis on reliability as the paramount factor influencing patient satisfaction in teledermatology, with empathy experienced least important. The study suggests that when used in teledermatology context, the SERVQUAL framework should be extended to include a technological perspective, emphasizing the central role of up-to-date technology. Patients emphasize the importance of doctors' communication and interpersonal skills, highlighting effective communication as a universal element that is crucial in both remote and face-to-face healthcare. Managerial implications emphasize prioritizing video connections, investing in doctors' communication skills, and ensuring seamless technology for improved remote dermatology services. Acknowledging limitations, the study paves the way for future research for a comprehensive understanding of teledermatology.

Keywords patient satisfaction, patient experience, teledermatology, SERVQUAL

Tekijä Emmi Kilpeläinen

Työn nimi Understanding Patient Priorities: Factors Influencing Patient Satisfaction in Teledermatology

Tutkinto Kauppätieteiden maisteri

Koulutusohjelma Tieto- ja palvelujohtaminen

Työn ohjaaja(t) Esko Penttinen & Merja Halme

Hyväksymisvuosi 2024**Sivumäärä** 56**Kieli** Englanti

Tiivistelmä

Teledermatologiasta on tulossa yhä yleisempi hoitomenetelmä erilaisiin ihosairauksiin. Aiemmissä tutkimuksissa on todettu, että potilaat ovat olleet yleisesti ottaen hyvin tyytyväisiä teledermatologiaan. Vielä kuitenkin tiedetään suhteellisen vähän siitä, mitkä seikat ovat tärkeimpiä potilaskokemuksen muodostumisessa. Tässä tutkimuksessa syvennytään teledermatologian potilastyytyväisyyteen hyödyntäen puolistrukturoituja haastatteluja ihotautilääkärin etäkonsultaatioihin osallistuvien henkilöiden kanssa. Tutkimuksessa on hyödynnetty SERVQUAL-mallia potilaille tärkeiden tekijöiden tunnistamisessa sekä palveluteemojen arvottamisessa. Alustavat kysymykset, avoimet kysymykset ja SERVQUAL-menetelmästä johdetut autetut avoimet kysymykset jäsentävät haastatteluja ja mahdollistavat potilaiden kokemusten vivahteikkaan tutkimisen. Keskittymällä luotettavuuden, reagoitavuuden, vaikuttavuuden, konkreettisen ympäristön ja empatian kaltaisiin palveluteemoihin tutkimuksessa pyritään tunnistamaan mallit ja painopisteet potilaiden käsityksissä teledermatologiasta. Tulokset osoittavat, että kaikki palveluteemat koetaan yleisesti ottaen erittäin tärkeiksi, mutta luotettavuus korostuu hieman tärkeimpänä potilastyytyväisyyteen vaikuttavana tekijänä, kun taas empatia koetaan vähiten tärkeäksi. Tutkimuksessa ehdotetaan teledermatologiassa hyödynnettävän SERVQUAL-kehiksen laajentamista teknologisen näkökulman osalta, korostaen ajan tasalla olevan teknologian keskeistä roolia. Potilaat korostavat lääkäreiden viestintä- ja ihmissuhdetaitojen merkitystä sekä korostavat tehokasta viestintää yleisenä tekijänä, joka on ratkaisevan tärkeää sekä etä- että kasvokkain tapahtuvassa terveydenhuollossa. Liikkeenjohtoon liittyvissä vaikutuksissa korostetaan videoyhteyksien priorisointia, lääkäreiden viestintätaitoihin panostamista ja saumattoman teknologian varmistamista ihotautilien etähoitopalvelujen parantamiseksi. Rajoitukset huomioon ottaen tutkimus tasoittaa tietä tulevalle tutkimukselle teledermatologian kokonaisvaltaisen ymmärtämisen saavuttamiseksi.

Avainsanat potilastyytyväisyys, potilaskokemus, teledermatologia, SERVQUAL

Acknowledgements

I would like to express my gratitude to DermaComp (anonymized) for their invaluable support and collaboration in the completion of this research. In addition, I would like to thank the patients who participated to the interviews, sharing their experiences and insights. Finally, I would also like to thank my thesis advisors, Esko Penttinen and Merja Halme, for their guidance, encouragement, and invaluable feedback throughout the research process.

Table of Contents

Acknowledgements	iii
1 Introduction	1
1.1 Background and motivation	1
1.2 Research Questions, Objectives and Scope	3
1.3 Structure of the thesis	3
2 Literature Review	4
2.1 Understanding Patient Experience and Satisfaction: A Review	4
2.2 Patient Satisfaction in Teledermatology: Factors and Perspectives	5
2.3 Patient Satisfaction in Telemedicine: Factors and Perspectives	8
2.3.1 Technological Aspects and Patient Satisfaction	8
2.3.2 Other Factors Affecting Patient Satisfaction.....	8
2.4 SERVQUAL Framework.....	9
2.4.1 Model Overview.....	9
2.4.2 Applications of SERVQUAL in telemedicine and healthcare context	10
3 Methodology.....	13
3.1 Research Design and Approach	13
3.2 Data Collection.....	13
3.2.1 Semi-structured Interviews	13
3.3 Data Analysis	16
4 Findings	18
4.1 Issues raised from preliminary questions and the interviews in general	18
4.2 Responses of open-ended questions	20
4.3 Responses of assisted open-ended questions: SERVQUAL framework.....	22
4.3.1 Reliability	23
4.3.2 Responsiveness	24
4.3.3 Assurance	25
4.3.4 Technology.....	26
4.3.5 Empathy	27
5 Discussion	30
5.1 Theoretical implications.....	30
5.2 Managerial implications	33
5.3 Limitations and future research.....	34
6 Conclusion	35

References.....	37
Appendix A: Interview Outline	43
Appendix B: Patient Vignettes	45

List of Tables

Table 1: The reviewed studies and their respectively utilized domains of patient satisfaction.....	6
Table 2: Comparison of live-interactive teledermatology to standard in-person care by four outcome measures.....	7
Table 3: The twenty healthcare service quality attributes divided between their respective five SERVQUAL dimensions.....	12
Table 4: Interview questions and research approaches, derived from the SERVQUAL dimensions	15
Table 5: Breakdown logic grouped factors.....	17
Table 6: Open-ended questions - Identified factors and their corresponding frequencies.....	20
Table 7: Assisted open-ended questions – Identified factors by dimensions and their corresponding frequencies.....	25

List of Figures

Figure 1. Visualization of the difference between the in-person and teledermatology service flows 2

1 Introduction

1.1 Background and motivation

Telemedicine, also known as telehealth, refers to the use of technology to provide healthcare services remotely. The concept stems from the early 1950s, where the early objective of telemedicine aimed to provide healthcare consultations to remote populations through various forms of telecommunications. (Zundel, 1996). Telemedicine has become increasingly popular in recent years due to technological advancements and the COVID-19 pandemic, which has highlighted the need for remote healthcare delivery to minimize the risk of infection. Telemedicine can include a range of services, such as remote consultations, remote monitoring of vital signs, and tele-education for healthcare professionals (Gajarawala & Pelkowski, 2021). Teledermatology is a subspecialty of telemedicine that involves the use of technology to diagnose and treat skin conditions remotely. Dermatology is particularly suitable for a telemedicine set up due to its visual nature and it allows dermatologists to provide care to patients who may not have easy access to dermatology services, such as those living in rural or remote areas, and can also improve the efficiency of dermatology clinics by reducing wait times and allowing for faster diagnoses (Mehrtens et al., 2019). The technology used in teledermatology vary from live-interactions to store-and-forward methods. Live-interactions may occur via video or telephone connection and store-and-forward method involves capturing and storing pictures or clinical data of a patient's skin condition, which are then forwarded or transmitted to a dermatologist or healthcare provider for review and analysis at a later time. The process flow for teledermatology reception is presented in and compared to a traditional in-person reception taking place at a local practice in Figure 1. It is important to note that the evaluation remains objective thorough.

Existing research indicates that teledermatology is often as effective as in-person care and offers a cost-efficient approach to reducing in-person evaluations (Andrees et al., 2020). However, despite its potential benefits, the adoption and implementation of teledermatology are still limited in some areas, and there are several challenges that require further investigation (Whited, 2006). Overall, the dermatology market is expected to grow further in coming years due to aging population, increased incidents of skin cancer, demographic trends, and overall improvement in health awareness (Al-adwan, 2020).



Figure 1. Visualization of the difference between the in-person (left) and teledermatology service flows.

For teledermatology to gain widespread acceptance, it must offer comparable clinical outcomes, costs (both direct and indirect) and availability to in-person visits (Nguyen et al., 2020). Additionally, patients and providers must be equally satisfied with remote consultations as they are with in-person visits (Nguyen et al., 2020). It is therefore vital to comprehend the factors that influence patients' experience during virtual appointments and determine how patients perceive these factors.

During this study I have had the opportunity to work with a private skin-care clinic (thereby referred as DermaComp) acting as a pioneer in the adoption of teledermatology services in the Finnish healthcare market. DermaComp's reception process is typically a combination of store-and-forward as well as live-interactive modes of treatment. Patients can send pictures of their skin before the reception so that the doctor can familiarize themselves with these before the live-interactive session. Live-interactive sessions take place either via video communication or via telephone. This partnership with DermaComp presents an excellent chance to utilize pre-validated research protocols from the fields of information science and business research to effectively map patient experience drivers in a teledermatology environment.

1.2 Research Questions, Objectives and Scope

The main objective of this research is to identify factors affecting patient satisfaction in tele dermatology and determine how the identified factors are valued among patients. Previous research indicates that the SERVQUAL model, which measures the variance between perceptions and expectations, is an appropriate instrument for evaluating service quality in several circumstances, despite certain deficiencies (Ladhari, 2009). Utilization of the model in healthcare sector has been identified as efficient. Hence, the service themes presented by the model are utilized as a foundation for identifying the important factors affecting patients' experience. In addition, the sub-objective of this study is to find out how patients perceive the classification of important factors between the themes. More specifically, the main research questions for this research are: 1) What are the factors in tele dermatology that patients value most? and 2) What SERVQUAL service themes patients value most in tele dermatology and what factors are considered to fall under each theme?

1.3 Structure of the thesis

The thesis is structured as follows. Next, literature review is presented addressing different forms of patient satisfaction and experience in tele dermatology context. The chapter then proceeds to discussing factors identified from previous literature that affect patient satisfaction and contribute to positive patient experience, both in tele dermatology and in telemedicine in general, and finally delves into the SERVQUAL model and its use in telemedicine and healthcare. Chapter three describes the methodology used in this study, including a detailed step-by-step description of data collection and analysis. In chapter four the results are presented in detail. In the discussion section, answers are presented to the research questions along with addressing theoretical and managerial implications followed by suggestions for future research and limitations of the study.

2 Literature Review

This section discusses firstly the concepts of patient satisfaction and patient experience, and how they have been used and defined in previous literature. The chapter then proceeds to discussing on previous research on the factors that have contributed to patient satisfaction firstly in teledermatology, and secondly in the field of telemedicine in general. Finally, this chapter introduces SERVQUAL framework and discusses how it can be utilized as a base for the research methodology.

2.1 Understanding Patient Experience and Satisfaction: A Review

Patient experience is a vital issue in medical care and a fundamental element in healthcare quality. Policymakers worldwide are increasingly interested in collecting data on patient experience to evaluate healthcare providers and drive quality improvement (Ahmed et al., 2014). Different terms like patient experience, patient perspective, patient reports, patient perception, and patient satisfaction are sometimes used interchangeably, leading to confusion of terms. Patient satisfaction is related to but distinct from patient experience, and their relationship varies depending on the context (Ahmed et al., 2014). Patient experience has several different definitions in the literature. According to Ahmed et al. (2014) patient experience encompasses both the experiences patients have during their care and the feedback they provide about those experiences. Another way of classifying patient experience and patient satisfaction is through the end-result point of view. Patient experience measures are suitable for identifying gaps in care quality and evaluating changes resulting from interventions or policies whereas patient satisfaction measures can reflect whether care meets individual needs and expectations (Larson et al., 2019). Same kind of point of view is also presented by Kupfer & Bond (2012), claiming patient satisfaction is rooted in consumer marketing, measuring how well services or products meet or exceed customer expectations. The authors state that patient satisfaction is assessed based on whether the service experience aligns with the customer's expectations. However, the relationship between patient satisfaction and the quality of the service can be complex and not always fully understood. While patient satisfaction is considered a desirable goal, its credibility as an objective and efficient means of improving healthcare outcomes is still debated in the medical literature (Kupfer & Bond, 2012).

2.2 Patient Satisfaction in Teledermatology: Factors and Perspectives

Studies show that patients have been overall satisfied with teledermatology over the years (Eedy & Wootton, 2001; Gilmour et al., 1998; Warshaw et al., 2011). Patients value especially the prompt diagnosis and treatment provided by a remote consultation, as it saves time and money associated with travelling (Eedy & Wootton, 2001). However, research shows that younger people tend to be more receptive to this technology, whereas elderly individuals, infants, and those experiencing genital ailments may be less tolerant (Eedy & Wootton, 2001).

The research of factors that impact patient satisfaction concerning teledermatology remains quite limited. This chapter will initially concentrate on the aspects that impact patient satisfaction in teledermatology, citing two articles by Hadelier et al. (2020) and Andrees et al. (2020). The two articles approach patient satisfaction from a measurement perspective but provide valuable insights of the topics that hold significance for patients in teledermatology.

Hadelier et al. (2020) conducted a systematic review focusing on patient satisfaction in teledermatology, particularly focusing on two modalities: live-interactive and store-and-forward teledermatology. The authors aimed to analyze recent research on patient satisfaction, how it was defined, surveyed, along with the preferences of patients for different teledermatology methods. The authors identified 23 studies and all of them identified overall patient satisfaction with both live-interactive and store-and-forward methods. In addition, one study compared patient preference for teledermatology modalities with face-to-face dermatology and found that patients still preferred face-to-face consultations. The review utilized Kraai et al.'s (2011) framework to categorise patient satisfaction into eight distinct domains.

Study	Accessibility	Efficacy	Technical quality	Physical Environment	Inter-personal manner	Finances	Availability	Continuity	Total domains in study
Frühauf et al. (2015) [32]	+	+	+	-	+	+	+	+	7
Frühauf et al. (2012) [13]	+	+	+	-	+	+	+	+	7
Nicholson et al. (2020) [10]	+	+	+	+	+	-	+	-	6
Wang et al. (2018) [22]	+	+	+	-	+	+	+	-	6
Rajda et al. (2018) [27]	+	+	+	+	-	-	-	-	4
Bianciardi et al. (2016) [20]	+	+	+	-	-	+	-	-	4
Azfar et al. (2011) [15]	+	+	+	+	-	-	-	-	4
Baranowski et al. (2019) [18]	+	+	-	-	+	-	-	-	3
Marchell et al. (2017) [28]	-	-	+	+	+	-	-	-	3
Quran et al. (2015) [17]	+	-	-	-	-	+	+	-	3
Hsueh et al. (2012) [12]	+	+	-	-	-	-	-	+	3
Bosanac et al. (2018) [26]	-	+	+	-	-	-	-	-	2
Lim et al. (2018) [16]	+	-	-	-	-	+	-	-	2
Fiks et al. (2018) [19]	+	-	-	+	-	-	-	-	2
Pathipati et al. (2016) [24]	-	-	-	+	-	+	-	-	2
Livingstone et al. (2015) [30]	-	-	-	+	+	-	-	-	2
Ford et al. (2015) [31]	-	+	-	+	-	-	-	-	2
Kaliyadan et al. (2013) [23]	-	+	-	+	-	-	-	-	2
Chee et al. (2016) [29]	-	-	+	+	-	-	-	-	1
Thind et al. (2011) [21]	+	-	-	-	-	-	-	-	1
Mehrtens et al. (2019) [11]	-	-	-	-	-	-	-	-	0
Lester et al. (2014) [25]	-	-	-	-	-	-	-	-	0
Koller et al. (2011) [14]	-	-	-	-	-	-	-	-	0
Total studies per domain	13	12	10	10	7	7	5	3	

Table 1: The reviewed studies and their respectively utilized domains of patient satisfaction. (Hadelar et al., 2020)

The definition of patient satisfaction varied across studies, making it challenging for the authors to compare results. However, the authors were able to identify eight domains of patient satisfaction from the studies: interpersonal manner, technical quality, accessibility, financial burden, efficacy, continuity, physical environment, and availability. Store-and-forward teledermatology was well received, especially by patients requiring multiple follow-up appointments. It was seen as cost-effective, flexible and efficient. However, some patients expressed concerns regarding privacy and discomfort with having their skin photographed. The authors conclude while patient satisfaction with teledermatology is generally positive, more research is needed to better understand patient preferences and how different aspects of teledermatology affect satisfaction. Addressing preference gaps and improving the diagnostic capabilities of teledermatology could further increase patient satisfaction.

Andrees et al. (2020) reviewed studies in their article comparing live interactive teledermatology with standard in-person dermatological care. The authors conducted a comprehensive literature search and included 23 studies in their analysis. Four outcome measures were derived from the main findings: time effectiveness, costs, feasibility, and

accuracy. The comparison between teledermatology and in-person care is summarized in Table 2 below.

Outcome measure	Number of studies per score			Total number of studies
	Score 1	Score 2	Score 3	
Time effectiveness	0	0	7	7
Costs	3	0	4	7
Feasibility	1	9	0	10
Accuracy	0	13	0	13

Score 1 = live interactive teledermatology application is inferior to standard in-person care; Score 2 = live interactive teledermatology application is comparable to standard in-person care; Score 3 = live interactive teledermatology application is superior to standard in-person care.

Table 2: Comparison of live-interactive teledermatology to standard in-person care by four outcome measures. (Andrees et al., 2020)

When it comes to time effectiveness, the articles revealed that live interactive teledermatology is generally more time-efficient than standard in-person care. It reduces waiting times, travel distances and consultation times. This is particularly beneficial in remote areas and specific settings. The cost-effectiveness of live-interactive teledermatology varies between studies. Some report cost-savings, while others find higher costs compared to standard care. However, comparing costs is difficult in general due to differences in study design and perspective. Patient and provider satisfaction with live-interactive applications was generally high. Most users were satisfied with live-interactive teledermatology, although some studies reported lower satisfaction rates compared to standard care. Doctors may have lower confidence in diagnoses when using live-interactive applications, but the authors claim this may improve with experience. Concerning accuracy, live-interactive teledermatology has been found to be comparable to standard care in terms of diagnostic accuracy. Concordance rates between live-interactive and standard care vary, but most studies show good concordance. However, the definition and measurement of concordance varies between studies. The authors also point out that the benefits of live-interactive applications also depend on the specific field, setting, and perspective of the teledermatology application.

2.3 Patient Satisfaction in Telemedicine: Factors and Perspectives

Previous research on factors influencing patient satisfaction in telemedicine is quite limited and has mainly focused on investigating the utilized technology, excluding other factors related to the patient encounter. Key technology-related factors identified in the research include themes like ease of use, technology-related reliability, and visual appearance, which this chapter firstly discusses deeper. Then, research concerning other factors outside technological aspects, such as interpersonal trust and visual cues are slightly addressed.

2.3.1 Technological Aspects and Patient Satisfaction

Technological solutions being the enabling factor in telemedicine, they naturally play an important role in patient experience. As internet- and technology-based solutions gain ground with accelerating speed, we need to shift our focus from measuring merely traditional service quality to measuring the quality of e-services, which takes different technological aspects into account (Parasuraman, 2000). When considering technological aspects that increase patient satisfaction and influence the overall patient experience positively, ease of use is often expected to be one of the core elements, especially if the technology is complex (Gagnon et al., 2016; Schnall et al., 2015; Parasuraman, 2000). Sanders et al. (2012) investigated in their study the experienced barriers of participating and adopting telehealth and telecare services. The authors noticed that one of the key reasons patients declined to participate or withdrew from the telehealth trial was requirement for technical competence and operation of equipment. Another important factor that rises from the literature is technology-related reliability (Schnall et al., 2015; Chang et al., 2013). A mixed-methods study conducted in Uganda by Chang et al. (2013) explored the perceptions and acceptability of mobile health interventions for improving patient care. In the study, some participants expressed concerns about the confidentiality and the security of patient data with multimedia capabilities. Another study conducted by Schnall et al. (2015) revealed that the use of mobile technology as a part of health care raised concerns among patients, particularly regarding the sharing of personal health information.

2.3.2 Other Factors Affecting Patient Satisfaction

According to Leisen & Hyman (2004) trust is crucial in the relationship between patient and doctor since doctors are placing more emphasis on aspects such as patient retention, positive word-of-mouth, and financial success. High level of trust between the doctor and patient is

associated with overall patient satisfaction, adherence to treatment, continuity of care and earlier disease detection (Safran et al., 1998; Mainous et al., 2004; Thom et al., 1999). Study conducted by Paul & McDaniel (2004) investigated the effect of interpersonal trust in virtual collaborative relationship performance, which can be thought of as an upper term for telemedicine. The study revealed that integrated interpersonal trust, containing calculative, competence, and relational trust, is necessary to ensure positive virtual collaborative relationship performance.

Remote consultations as a part of telemedicine often take place via video or telephone connection. Studies comparing remote consultations through video connection and telephone have found that patients prefer the former due to visual cues (Henry et al., 2017; Donaghy et al., 2019). Visual cues can be considered to include all non-verbal signs that are used to communicate. Video connection enables doctors and patients to identify visual cues, such as facial expressions and body language, ultimately improving the communication process. Patients have reported feeling more confidence towards the consultation and finding the consultations to be more personal and reassuring when conducted via video connection, as opposed to telephone. Research has found that this is due to the presence of visual cues. (Donaghy et al., 2019).

2.4 SERVQUAL Framework

2.4.1 Model Overview

SERVQUAL is a multi-item scale originally developed and further refined by Parasuraman et al. (1988) to measure customer satisfaction in service and retail industries. The scale is based on the observation of the gap between customer expectations and perceived service quality. The measurement of the gap is based on 22-items representing five dimensions, Tangibles, Reliability, Responsiveness, Assurance, Empathy. The dimensions and their more detailed descriptions in service sector are presented below.

- 1) Tangibles: the appearance of physical facilities, equipment, personnel, and communication materials.
- 2) Reliability: the ability to perform the promised service dependably and accurately.
- 3) Responsiveness: the willingness to help customers and provide prompt service.
- 4) Assurance: the knowledge and courtesy of employees and their ability to convey trust and confidence.

- 5) Empathy: the provision of caring, individualized attention to customers.

Where service quality has been widely measured in the general health sector using SERVQUAL scale, the results may vary considerably when the reception is moved to a remote context. Existing academic research on measuring service quality in the field of tele dermatology remains quite limited. Through the utilization of the SERVQUAL dimensions presented above, an exhaustive understanding of the patient's experience in tele dermatology can be attained by including them in the interview questions. Accordingly, identifying both areas of strength and potential areas of improvement in the service is facilitated, which ultimately contributes to the enchantment of patient satisfaction and the overall quality of tele dermatological care. Research on SERVQUAL framework applied to tele dermatology context being extremely limited, the next chapters focus on studying the applications of SERVQUAL in healthcare and telemedicine context in general.

2.4.2 Applications of SERVQUAL in telemedicine and healthcare context

In this chapter, an overview of how the SERVQUAL model has been utilized in a healthcare setting is presented. The studies discussed here will provide a solid basis for adopting the SERVQUAL approach as a base framework for this research.

Research conducted by Tripathi & Siddiqui (2018) explores customers' expectations and perceptions in healthcare context using the SERVQUAL framework. Within the framework, the authors focus on measuring service quality and capturing customer satisfaction and purchase intent through the five dimensions already mentioned, including tangibles, reliability, responsiveness, assurance, and empathy. The authors developed a total of 20 health service quality attributes, each representing one of the five service quality themes identified in the original SERVQUAL framework. The authors arrived at these 20 attributes through exploratory research methods, including literature review, pilot survey, focus group interviews as well as depth interviews. The focus group interviews were conducted with patients, and the in-depth interviews with doctors and other health care professional. The explored attributes as well as the corresponding dimensions are presented in Table 4.

Analytical Hierarchy Process (AHP) was applied to prioritize service quality dimensions and attributes. The study revealed that customers prioritize the "Reliability" dimension highest, followed by "Assurance," "Responsiveness," "Tangibility," and

"Empathy." Gap analysis indicated shortcomings in "Reliability," "Responsiveness," and "Empathy" compared to customer expectations, while "Tangibility" and "Assurance" exceeded expectations. Based on the study results, Tripathi & Siddiqui (2018) advise health care providers to focus on improving "Reliability", "Responsiveness", and "Empathy" to better meet customer expectations. The authors recommend focusing on consistent and dependable service delivery, transparent billing practices, and staff training for prompt and empathetic care. These results are quite in line with the studies conducted by Pekkaya et al. (2019) and Al-Neyadi et al. (2018). In the former study, the authors assessed health care service quality and patient satisfaction using SERVQUAL scale. The results showed that patients perceived different levels of service quality across the five SERVQUAL dimensions. Tangibles, which include physical conditions and modern equipment, were rated the highest. Reliability was identified as the most critical dimension for outpatient satisfaction. In addition, the study revealed that the patients' demographic factors such as age, income, and service type influenced their perceptions of healthcare service quality. For instance, lower-income patients tended to rate healthcare quality higher. The study conducted by Al-Neyadi et al. (2018) evaluated healthcare service quality in private and public hospitals in the United Arab Emirates (UAE) based on the five SERVQUAL dimensions. "Assurance" and "Reliability" were rated as the highest dimensions among patients, while "Responsiveness" was perceived as the least important dimension.

Tangibility	Up to date equipment Visually appealing physical facilities Employees should be well dressed and appear neat and clean
Reliability	High standards of hygiene and cleanliness Services are delivered as promised Employees are sympathetic and reassuring Healthcare facility is dependable Services are delivered at the promised time Records and billing are transparent and accurate
Responsiveness	Employees are always willing to help customers Employees are very prompt in their response Employees are always polite
Assurance	Customers trust the employees of the hospital Customers feel safe while transacting with hospital employees or Doctors Employees/ doctors have sound knowledge of their respective fields Employees / doctors get adequate support from the hospital Management
Empathy	Employees/ doctors give personal attention to customers Employees/ doctors understand needs of the customers Employees/ doctors have the customer's best interest at heart Service is always available according to the convenience of the Customers

Table 3: The twenty healthcare service quality attributes divided between their respective five SERVQUAL dimensions. (Tripathi & Siddiqui, 2018)

A study conducted by Mason (2022) explored the dimensions of patient satisfaction in telemedicine, with a focus on using the SERVQUAL model to identify the most significant factors affecting patient satisfaction. A total number of 440 telemedicine patients were surveyed for the study and four performance dimensions of telemedicine service were examined: health benefits, patient-centered care, monetary and non-monetary costs. The study found that among the identified dimensions of patient satisfaction, patient-centered care was found to be the most significant. This dimension emphasizes the importance of positive provider-patient interactions, including empathy, responsiveness, and assurance, in influencing patient satisfaction. Furthermore, patients' perceptions of the health benefits they received from telemedicine services also played a significant role in determining their satisfaction levels. When it comes to the two latter performance dimensions, monetary and non-monetary costs associated with telemedicine services, the study revealed them not having a significant effect on patient satisfaction.

Hadwich et al. (2010) investigated requirements of e-health services in their study and developed a measurement model to analyze the concept of “perceived e-health service quality”. In the study, several in-depth interviews were conducted in Switzerland. The first group consisted of six patients who acted as raters, followed by two experts in the healthcare system who acted as judges. The findings of the study reveal that the concept of e-health service quality can be defined as a formative construct and comprises 13 factors, including accessibility, competency, information, usability, security, system integration, trust, individualization, empathy, ethical conduct, performance level, reliability, and responsiveness. The research indicates that e-health services are perceived at various levels of abstraction, and that their primary dimensions comprise potential, process, and outcome qualities.

3 Methodology

3.1 Research Design and Approach

As previously discussed, the objective of this research is to identify the primary factors that patients value the most in tele dermatology and to determine the most valued service themes under SERVQUAL framework by patients, along with identifying what factors patient value under each category. The research data was gathered through interviews with patients and the objective was to gather in-depth insights from patients’ perspectives, experiences, and opinions. Therefore, a semi-structured interview model was chosen to be the most appropriate method, since it has been found to be an effective way to get to know individual’s independent thoughts (Adams, 2015). The interview was designed in a way that it contained three sections: preliminary questions, open-ended questions and assisted open-ended questions. The SERVQUAL framework was utilized as a base when creating the interview protocol. The recorded interviews were then transferred to verbatim and analyzed according to the steps presented further in this chapter.

3.2 Data Collection

3.2.1 Semi-structured Interviews

The data was collected using semi-structured interviews. This methodology was chosen for the research due to some key characteristics presented by Adams (2015), that suited well with the research approach. Firstly, as dermatology is often perceived as quite a sensitive

area of medicine and some patient might feel themselves uncomfortable of speaking such issues among other patients, semi-structured interviews are suggested over a focus group method (Adams, 2015). Secondly, this particular interview method is suitable in situations, where the interviewer is not able to address effectively important questions with using mere standardized survey questionnaire, but rather needs to include more open-ended questions and extended probing (Adams, 2015). When formulating the interview protocol, it was apparent that to access the authentic feelings and experiences of the interviewed patients, the interview situation would need to be more conversational and relaxed. Thus, semi-structured interviews were chosen to be the most suitable interview method for this research.

To ensure the anonymity of the patients, the interviews were conducted via telephone. In addition, telephone interviews were suitable for investigating this research context. Participants are less prone to give socially desirable answers, and sensitive topics can be discussed more effortlessly than in face-to-face interviews (Robson, 2002). In addition, research conducted by Ward et al. (2015) reveals that individuals who participated to telephone interview “felt not being judged or inhibited”. Due to the sensitive nature of dermatology the chosen interview method was identified as the best option.

Regarding the design of the interview protocol, Adams (2015) underlines the need to prioritize the most important topics before commencing the interview process, ensuring that sufficient insight is gained on the topics. According to this view, the most important objectives were well identified prior to the interviews, and the interview protocol was designed in a way that these objectives were reflected through the questions. The interview consisted of three parts: preliminary questions, open-ended questions, and assisted open-ended questions, derived from the dimensions of the SERVQUAL model. All the questions concerned the patient’s experiences, feelings and attitudes towards their remote consultations. The open-ended questions were structured to allow patients to describe their experiences with teledermatology honestly and without bias. The patients were also given the chance to highlight crucial aspects of remote consultations that they deemed important. The assisted open-ended questions were structured to guide patients in considering their opinions, perceptions, and experiences within a specific SERVQUAL dimension. In addition, as a part of the actual assisted open-ended questions, the patients were asked to give a response describing the perceived importance of each dimension. The perceived importance was measured on a scale of 1 to 7. The range was chosen to capture the experienced feeling as accurately as possible and to reflect any differences in patients’ feelings. The dimensions and their corresponding research approaches along with the actual

interview questions are presented in Table 4. The final interview template including all the questions can be found in the Appendix A. To ensure the anonymity of the patients, any specific questions about the patient's demographic characteristics were left out of the interview protocol. Patients' age and gender were assumed based on the voice.

SERVQUAL Dimension	Description in the literature	Research approach	Interview question
Tangibles	The appearance of physical facilities, equipment, personnel, and communication materials.	Investigate the experienced functionality of physical aspects of the teledermatology service, which in this case corresponds the technology used.	On a scale of 1-7, how important do you consider that the technology used in remote consultations is up-to-date?
Reliability	The ability to perform the promised service dependably and accurately.	Investigate the level of importance patients place on reliability during teledermatology service. Explore how patients experience trust during teledermatology service.	Can you identify factors that you believe contribute to a reliable experience during remote consultations? On a scale of 1-7, how important do you consider reliability as a part of remote consultations? (1= not important at all, 7 = highly important)
Responsiveness	The willingness to help customers and provide prompt service.	Investigate the level of importance patients place on responsiveness during teledermatology service. Explore how patients experience the quality of the teledermatology service concerning the level of promptness and diligence.	Can you identify factors that you believe contribute to a prompt and diligence experience during remote consultations? On a scale of 1-7, how important do you consider a prompt and diligence remote consultation experience? (1= not important at all, 7 = highly important)
Assurance	The knowledge and courtesy of employees and their ability to convey trust and confidence.	Investigate the level of importance patients place on assurance during teledermatology service. Explore how patients experience health care providers' competence during teledermatology service.	Can you identify factors that convince you of the competence and skills of the doctor during a remote consultation? On a scale of 1-7, how important do you consider the doctor's ability to communicate his/her competence and skills during a remote consultation?

Empathy	The provision of caring, individualized attention to customers.	Investigate the level of importance patients place on empathy during teledermatology service. Explore how patients experience received empathy during teledermatology service.	Can you identify factors that you believe make remote consultation as an empathetic experience? On a scale of 1-7, how important do you consider the doctor's ability to convey empathy during remote consultations? (1= not important at all, 7 = highly important)
---------	---	--	--

Table 4: Interview questions and research approaches, derived from the SERVQUAL dimensions.

DermaComp provided the contact information of patient interviewees, who had recently attempted a dermatologist remote consultation. A total of nine patients were interviewed. This number was considered sufficient, as no more new elements emerged in the responses to the latest interviews. The remote consultation took place either via video connection or telephone. The interviews were held in Finnish to ensure more convenient and fluent communication as that was the first language of majority of the interviewees (few patients spoke Swedish as their first language). The interviews were then translated into English as a part of the transcribe phase.

3.3 Data Analysis

The interviews were recorded with the permission of the interviewees, using a computer audio capture program. The recorded interviews were manually transcribed into a verbatim, followed by converting the verbal translation into a condensed text format using Microsoft Word. The interview data was then transformed into an excel sheet according to the following steps.

The written interviews were first analyzed and divided into different parts based on the order of the questions. As discussed in the previous chapter, the interview consisted of preliminary questions, open-ended questions, and assisted open-ended questions, derived from the dimensions of the SERVQUAL model. Regarding the objective of the research the two last sections of questions were the most relevant in this phase and thus, under the analysis. From each of the sections, different factors were identified from the interviews and transferred to a table, which had identified factors in the vertical row and interview numbers in the horizontal row. For the last section including the multiple set of questions based on the SERVQUAL dimensions, the table included additional vertical row which categorized the identified factors based on the themes of the model. To avoid excessive

number of factors and to prevent duplicate factors, some of the factors mentioned among patients were grouped into main categories. The breakdown logic is presented in Table 5. Secondly, the occurrence of identified factors was counted between the interviews and marked on the horizontal row of the table. The occurrences were then summed outside the table to configure the total frequencies of each identified factor. In addition, when analyzing the last section, using a separate table the average importance value of each element was calculated.

Main category	Factors mentioned during interviews
Video connection	<ul style="list-style-type: none"> ● Ability to see the doctor ● Doctor's visual cues (face gestures, body language)
Doctor's attitude	<ul style="list-style-type: none"> ● Dedication to solve the patient's ailment ● How seriously the doctor is taking the patient's ailment ● Showing respect towards the patient's ailment
Professional physical appearance	<ul style="list-style-type: none"> ● Doctor's proper attire ● Doctor sitting in front of the computer ● No background noise ● Doctor's gaze focused on the camera
Doctor's thoroughness/punctuality	<ul style="list-style-type: none"> ● Clear maintenance instructions or follow up steps for the ailment ● Writing thorough notes in patient records
Doctor's comprehensive profile in the booking system	<ul style="list-style-type: none"> ● Experience ● Specialization area ● IT skills ● Up-to-date profile picture
Data protection/Secure technology	<ul style="list-style-type: none"> ● Booking remote appointments through the same system than traditional in-person appointments ● Receiving confirmation email and link to the video call from service provider ● Receiving video call link and sending symptom pictures via secure mail
Preparation by the doctor	<ul style="list-style-type: none"> ● Examination of symptom pictures ● Reading additional descriptions written by the patient

Doctor's communicational/interpersonal skills	<ul style="list-style-type: none"> ● Way of speaking ● Way of listening ● Ability to create a sense of calmness during the appointment ● Social skills ● Sense of humor ● Undivided attention/genuine presence ● Way of contacting the patient in the beginning of the appointment
Diagnostic skills	<ul style="list-style-type: none"> ● Successful diagnosis without physical examination ● Self-assurance (admitting uncertainty when necessary)
Comprehensive investigations and holistic care	<ul style="list-style-type: none"> ● Focusing on the whole process of the ailment instead of mere prescription writing ● Offering multiple treatment options when possible

Table 5: Breakdown logic for grouped factors.

4 Findings

The results are presented as follows: Firstly, answers to the preliminary questions and general issues raised during the interviews are briefly discussed and analyzed, setting the scene for subsequent discussion of the responses to the open-ended questions and assisted open-ended questions derived from dimensions of the SERVQUAL framework.

4.1 Issues raised from preliminary questions and the interviews in general

Many patients decided to use teledermatology rather than traditional in-person treatment due to several reasons. Several patients who were interviewed opted to book a remote consultation because they wanted guidance on whether they should physically attend the local practice to show their ailments, viewing teledermatology as a preliminary step before attending an in-person appointment. In addition, many patients reported they preferred an in-person visit in situations where there was a new and unfamiliar ailment in question. These patients chose to use teledermatology if they had a familiar ailment and/or wanted to renew prescriptions. One patient also stated that even if they would receive a diagnosis from a doctor during a remote consultation, they would still consider visiting a local practice to get peace of mind. Another reason mentioned for choosing teledermatology was availability. Patients reported that available in-person appointments times were sometimes difficult to find and thus, they decided to book remote consultation to speed up treatment. Furthermore,

some of the interviewed patients lived outside the metropolitan area, which allowed them to save time and travel costs through tele dermatology.

“It (remote consultation) suited my schedule better. I live outside the metropolitan area, about an hour away.”

-Interviewee 5

“It (remote consultation) was available, it seems that appointments are really busy at the moment, so just on the basis of availability I opted for the remote consultation.”

“My symptoms were quite mild, and I was already familiar with the diagnosis, so I practically knew what the problem was. Of course, it would have been different if it had been a completely new, unknown disease, then I might have considered going to a local practice.”

-Interviewee 4

“In more challenging cases, I still prefer in-person visits. For me, remote consultations are perhaps mainly for those visits when there is an acute need for a prescription renewal or when you want a confirmation on should you book an in-person visit or not.”

-Interviewee 2

Another interesting finding that emerged from the interviews was how patients valued different elements. For some, it was important that the technology used in tele dermatology was high-quality and stable, while other patients put more emphasis on the soft skills of the doctor, such as the ability to convey their personality and social communication skills. It was also surprising how tele dermatology was experienced by patients overall. Some patients felt that tele dermatology was significantly different from in-person appointments, while others felt that it was almost the same experience without significant differences. However, in general, during the interviews revealed that although the questions were related to tele dermatology and patients were specifically asked about their experiences of remote consultations, many of them, perhaps unconsciously, reflected on the answers through a traditional in-person appointment. This was especially noted with assisted open-ended questions, where the service themes were given and therefore the patients' thinking process was slightly assisted. This may have been due to the formulation and wording of the

interview questions, or it could be that the patients in question did not genuinely feel that the experiences were different.

“I think it went exactly the same way as in-person appointment, except there was no physical confrontation.”

-Interviewee 9

“Of course, the experience is very different face to face (compared to remote consultation), especially when it's a dermatologist's office in question. It's really important that the doctor has the opportunity to see the skin.”

-Interviewee 7

4.2 Responses of open-ended questions

Patients were asked to name factors that they consider significant regarding overall teledermatology experience. Most patients considered technological aspects including e.g. high-quality technology and stable uninterrupted connections to be significant elements in teledermatology affecting the overall experience. Technology-related factors are further discussed in the next chapter, in the context of assisted open-ended questions. When it comes to common elements that emerged from patients' responses, several patients appreciated the feeling of presence and tranquility during the remote consultation as well as the recognition of individuality they received instead of being viewed as “one of the crowds”. This aspect is particularly significant in the context of teledermatology since the absence of physical interaction makes it more difficult to communicate these elements effectively. Factors that enhance the feeling of presence, tranquility, and individuality as perceived by patients included aspects like doctor's communicational and interpersonal skills during the remote consultation along with doctor's physical appearance and prior preparation for the remote consultation. Including video connectivity as a component of teledermatology was also mentioned, and this aspect is associated with the feeling of presence, tranquility, and individuality.

Factors related to the communicational and interpersonal skills of the doctor, which patients perceive as contributing to doctor's presence during the remote consultation included doctor maintaining eye contact with the patient, i.e. gaze directed to the video camera, recalling the patient or the issue of the patient from possible previous appointments,

and dictating the actions performed that are not visible for the patient. The last-mentioned factor relates to the scenario where, during a remote consultation, the patient is unable to observe the doctor's actions on the computer, leading to a possible misconception of the doctor's full presence.

“If the doctor (...) is reading a patient text or writing a prescription at the same time, then in a telehealth context the patient does not know what the doctor is doing there, so it is important that the doctor informs the patient what s/he is doing.”

-Interviewee 6

How the doctor appears physically for the patient during the remote consultation was regarded to convey a sense of presence and calmness. One patient with extensive experience of telehealth abroad reported having multiple remote consultations where the doctor used a telephone instead of a computer for the video call. This left the remote consultation with a hectic and unprofessional impression. Thus, she emphasized the significance of the doctor being positioned visibly in front of the computer during the virtual consultation.

“In the past, I've had remote consultations that look like the doctor is sitting by the phone, which gives the patient the impression of being in a hurry.”

-Interviewee 3

When it comes to the prior preparation of the doctor some of the patients felt that it is crucial that the doctor has already familiarized him/herself with the symptom pictures before the appointment. According to the patients, if the pre-sent pictures are unclear or if otherwise necessary, the doctor should suggest a local practice. The doctor should demonstrate their proficiency to aid the patient via teledermatology, mitigating potential dissatisfaction resulting from an inability to receive assistance.

“If the (pre-sent) pictures would have been really unclear, the doctor could have been said before the remote consultation, 'I'm afraid I can't read the images, so you'll have to come in for a local consultation.' In other words, the doctor could anticipate how to serve the patient so that the patient wouldn't be disappointed because s/he didn't get help.”

-Interviewee 2

Other factors mentioned by individual patients include thorough service, up-to-date information in patient records, prior face-to-face meeting with a doctor, and receiving the same quality service as in local practice. Thorough service was considered entailing receiving clear instructions on how to manage the ailment and obtaining clarification on whether it is a minor issue or if the patient should schedule an appointment for sampling or a physical examination. Up-to-date information in patient records and prior face-to-face meeting with a doctor was brought up by one patient who highlighted the importance of getting high quality diagnosis through teledermatology. The patient emphasized the necessity for comprehensive patient records and for the doctor to have conducted physical examination of the overall condition to provide appropriate treatment for the ailment through teledermatology.

The identified factors and their corresponding frequencies among the interview responses are presented in Table 6.

Factor	Frequency
Doctor's communicational/interpersonal skills	3
Video connection	2
Preparation by the doctor	2
Professional physical appearance	2
Doctor's thoroughness/punctuality	1
Receiving same quality service as in local practice	1
Prior face-to-face meeting with a doctor	1
Up to date patient information	1

Table 6: Open-ended questions - Identified factors and their corresponding frequencies.

4.3 Responses of assisted open-ended questions: SERVQUAL framework

This chapter discusses the results from the assisted open-ended questions, derived from the service themes of SERVQUAL dimensions. For clarity reasons, when analyzing the results, the dimension previously called “Tangibles” during this research was renamed to “Technology”, as it merely encompasses technology-related factors. Identified factors under

each service theme and their corresponding frequencies among the interview responses are presented in Table 7.

4.3.1 Reliability

Reliability and trust as a part of remote consultation appeared to be a consistent priority among patients, with an average importance of 6,78 (of 7). This theme ended up containing the most identified factors among interviewed patients, as twelve different factors were identified. Patients valued reliability through different aspects, the visibility of the doctor through video connection being the most valued aspect. In addition, the doctor's attitude towards the patient's ailment was pointed out several times, including doctor's dedication to solve the ailment and taking the ailment seriously and respectfully. Patients also considered the fact that the appointments started at the booked time to increase the reliability of remote consultations. Other important factors affecting the experienced level of trust during remote consultations were doctor's professional physical appearance, including professional-looking and proper attire, and the video image giving the impression of doctor sitting in front of the computer and thus, taking the remote consultation on the computer and not on the phone. Some patients considered a sense of privacy during the appointment as a key element for establishing trust, which may be hindered by background noise or if the doctor fails to maintain a direct eye contact with the video camera and instead looks somewhere out of view of the patient. According to one patient, these aspects may give the patient a feeling that there is someone else in the doctor's room and thus the level of trust is affected. Less significant aspects, meaning pointed out by individual patients, related to the level of experienced reliability during remote consultations were doctor's communicational and interpersonal skills during the remote consultation along with a fundamental work approach, including giving clear ailment maintenance instructions or follow up steps along with writing thorough notes in patient records. In addition, one patient who experienced limited reliability in remote consultations to begin with, associated secure technology and data protection being valuable factors when considering the level of reliability during remote consultations. Another technology related aspect associated with reliability was brought up by a patient, who pointed out high-quality technology and stable connections playing important roles in the reliability of remote consultation. Two patients underlined the importance of prior encounter with the doctor in order to experience a strong relationship of trust with the doctor during a remote consultation. One of these patients felt that it is crucial that the patient and the doctor have met each other physically at a local practice at least once before the remote

consultation, whereas the other one thought that a mere prior familiarity is sufficient, meaning that there exists some form of prior encounter with the doctor before the remote consultation. Another aspect identified by an individual patient, which impacted the level of experienced reliability during remote consultations, was the extent of detail provided in the doctor's profile on the booking system. According to the patient, knowing something about the doctor and his/her background beforehand along with being familiar with the doctor's appearance, gives the patient a more confident feeling about the remote consultation.

“Hearing someone else's voice in the background or the doctor looking outside the camera makes you wonder if there's someone else in the room who could hear my information. When the camera is pointed in one direction, you don't know who else might be in the room. There is no such situation in a local practice.”

-Interviewee 6

“In my opinion, building trust requires that you have been to the doctor's local practice before, that you have encountered the doctor face to face. In that situation, a relationship of trust is established.”

-Interviewee 8

4.3.2 Responsiveness

Promptness and diligence of the experienced service during remote consultation was highly valued among patients, with an average importance of 6,44 out of 7. Seven different factors were identified within this theme. Aspects like starting the appointment on the booked time and comprehensive investigations along with holistic care instead of just mere prescription writing were considered highly important factors when considering the promptness and diligence of the experienced service during remote consultations. Prior preparation by the doctor including investigating the pre-sent symptom pictures and/or reading the potential pre-written symptom description by the patient was also pointed out by several patients along with the doctor's communicational and interpersonal skills, including professional way of speaking. The ability to see the doctor through video connection was also mentioned multiple times. One patient mentioned getting a sense of doctor's full presence during the remote consultation through video connection gives the patient prompter and more diligence

feeling of the service received. Less significant factors pointed out by individual patients were related to things such as receiving appointment confirmation email from the service provider after booking the appointment, getting doctor's undivided attention during the remote consultation, doctor's professional physical appearance and how thoroughly the doctor writes notes to the patient record based on the remote consultation.

“In a remote consultation, if the images have been sent in advance, the doctor has already examined them before the consultation. The ailment is then examined more holistically, whereas at a local practice the focus may be more on the symptoms, which in some cases may be insignificant at the time.”

-Interviewee 2

4.3.3 Assurance

Patients across different demographics valued highly that the doctor is capable of conveying his/her competence during remote consultations, with an average importance of 6,44 out of 7. Patients recognized nine different meaningful factors inside this service theme. The most pointed factors among the patients were the doctor's comprehensive profile in the booking system along with doctor's diagnostic skills. According to the patients, the display of in-depth information about a doctor's professional background and specialization gives the impression that they are competent and skilled. One patient also noted, that in the case of remote consultations, it would be beneficial to display doctor's IT skills as part of the profile, since it is crucial part of doctor's competence in a tele dermatology context and patients would not have to worry about wasting time to technology related issues during the remote consultation. The second most valued factors inside this service theme were doctor's communicational and interpersonal skills along with the prior preparation for the appointment by the doctor. Related to the communicational skills of the doctor during the remote consultation, one patient pointed out how she valued doctor's ability to admit when s/he is uncertain about the diagnosis. According to her, this kind of professional self-assurance increases the sense of competence of the doctor, rather than the doctor giving an ambiguous diagnosis which leaves an uncertain feeling for the patient. A moderately valued factor affecting the level of doctor's competence experienced during remote consultations was doctor's attitude towards patient's ailment. This implicates the feeling of the patient on how seriously the doctor is taking his/her ailment and how genuinely and dedicatedly the

patient feels the doctor is willing to solve the problem, even though it is more complicated ailment to diagnose and requires further investigation. Less significant factors recognized by individual patients affecting the level of experienced doctor's competence during a remote consultation were doctor's professional physical appearance, high quality video and internet connections along with doctor focusing on comprehensive investigations and holistic care instead of mere prescription writing.

“I was already convinced when I made the appointment, when I saw the doctor's experience and background from the booking system, that was enough to convince me (of the doctor's competence). I do not feel that this is an important issue to convey or discuss during the remote consultation.”

-Interviewee 4

“The way the doctor dresses, even if it's a remote consultation. (...) The fact that the doctor is on time. That s/he has a good voice and a good internet connection. And no background noise, like children running in the background or dogs barking. So that you feel like you are having a private appointment.”

-Interviewee 3

4.3.4 Technology

When it comes to technology used during remote consultations, patients considered highly valuable the technology is up-to-date, with an average importance of 6,44 out of 7. Aspects mentioned inside this service theme were related to high quality and stable video, telephone, and internet connections alongside high-quality symptom pictures. According to the patients, the latter is especially important in teledermatology context, since sometimes the symptoms may be quite invisible and difficult to capture in pictures with lower quality. Multiple patients pointed out since technology being the cornerstone in remote consultations there is no sense of organizing appointments remotely if the connections are low quality and image and sound connections are constantly interrupted. Another aspect that arose during the interviews was the doctors' ability to innovate and solve technological problems during teledermatology. If technological issues or connectivity problems occur during the consultation, the doctor's ability to come up with alternative solution to complete the appointment rather than directly rescheduling physical appointment at a local practice was

highly valued. Other issues raised within this service theme included the necessity for both the doctor and the patient to be acquainted with the technology and equipment used in teledermatology, and the importance of unambiguous instructions for patients on how to operate the technology.

“Doctor’s problem-solving approach is important with technology, so that the time allocated to the consultation is being used. I also like the fact that the doctor is innovative and comes up with a low-threshold solution, rather than immediately suggesting a visit for local practice (if there occur problems with the technology).”

-Interviewee 2

4.3.5 Empathy

When it comes to doctor’s ability to convey empathy during remote consultations, the level of importance of this theme varied significantly among interviewed patients. However, empathy as a part of remote consultations was generally perceived as moderately important, with an average importance of 5,56 out of 7, including five different factors affecting this service theme recognized by the patients. Interestingly, male patients rated this dimension lower than female patients did. Based on interviews with male patients, their objective is to merely resolve their dermatological issue and therefore, empathetic support during teledermatology was not a significant concern for them. One patient also noted that in teledermatology patients may initially expect less empathy compared to physical appointments, as they often perceive remote consultations as more clinical and suitable for pure consultation rather than seeking emotional support, security, or comfort.

According to the patients, factors experienced to increase the sense of empathy during remote consultation did not differ significantly from those in a physical appointment. The most significant recognized factor that played a key role how empathetic the patients felt the remote consultations was doctor’s communicational and interpersonal skills, including the doctor’s ability to convey good communication and social skills in a remote setting, along with overall honesty. One patient experiencing a long-term dermatological ailment pointed out how doctor’s sense of humor and ability to convey it during a remote consultation influences the level of experienced empathy, especially in a case of long-term ailment like with her case. The second most important factor recognized among the patients was the doctor’s attitude towards the patient’s ailment. Patients felt empathy when they experienced that the doctor has a serious approach to the problem and is genuinely willing to find a

solution. Also, the ability to see the doctor's face gestures and body language through video connection affected how empathetic the remote consultation was experienced by the patients. Other factors underlined by individual patients were doctor's comprehensive investigation and holistic care, and the way the doctor encounters the patient in the beginning of the remote consultation, giving the patient a welcoming feeling.

“The important thing is that you see the doctor, you see the gestures. And, that the doctor is genuinely focused on the patient and not doing something else at the same time, writing a statement about another patient etc.”

-Interviewee 1

“The doctor's own social skills/personality, what sort of person is sitting there on the other end of the line, how do you greet the patient and ask questions, that sort of general attitude.”

-Interviewee 4

“The patient may not expect the same level of empathy as in a face-to-face appointment because it (remote consultation) is perhaps a more clinical way of doing things. If you need support, reassurance, and comfort, then you may not even go to a remote consultation.”

-Interviewee 6

Dimension	Factor	Frequency	
Reliability	Video connection	3	
	Doctor's attitude	3	
	Professional physical appearance	2	
	Doctor's communicational/interpersonal skills	2	
	Starting appointments on booked time	2	
	Data protection/Secure technology	2	
	Doctor's thoroughness/punctuality	1	
	Prior doctor-patient relationship/familiarity with the doctor	1	
	Doctor's diagnostic skills	1	
	Doctor's comprehensive profile in the booking system	1	
	High-quality technology/stable connections	1	
	Prior face-to-face meeting with a doctor	1	
	Responsiveness	Doctor's communicational/interpersonal skills	4
		Starting appointments on booked time	3
Comprehensive investigations and holistic care		3	
Preparation by the doctor		2	
Video connection		2	
Appointment confirmation by email		1	
Professional physical appearance		1	
Assurance		Diagnostic skills	5
	Doctor's comprehensive profile in the booking system	4	
	Doctor's communicational/interpersonal skills	3	
	Preparation by the doctor	3	
	Doctor's attitude	2	
	Professional physical appearance	1	
	Starting appointments on booked time	1	
	High-quality technology/stable connections	1	
	Comprehensive investigations and holistic care	1	
Empathy	Doctor's communicational/interpersonal skills	8	
	Doctor's attitude	3	
	Video connection	2	
	Comprehensive investigations and holistic care	1	
	Professional physical appearance	1	
Technology	High-quality technology/stable connections	6	
	Doctor's IT skills/familiarity with the technology	4	
	Doctor's problem-solving ability	3	
	Clear instructions on how to use the technology	1	

Table 7: Assisted open-ended questions – Identified factors by dimensions and their corresponding frequencies.

5 Discussion

The main objective of this research was to identify factors affecting patient satisfaction in teledermatology and determine how the identified factors are valued among patients. More specifically, the main research questions for this research were: 1) What are the factors in teledermatology that patients value most? and 2) What SERVQUAL service themes patients value most in teledermatology and what factors are considered to fall under each theme? The data was gathered using semi-structured interviews with patients, who have recently been participating in a dermatologist remote consultation. The interview consisted of preliminary questions, open-ended questions and assisted open-ended questions that were derived from the dimensions of the SERVQUAL framework.

Teledermatology has been found to be comparable to in-person dermatology in several areas of performance (Andrees et al., 2020), but still relatively little is known about which aspects are most important in shaping the patient experience. This research revealed several findings that are in line with the previous literature but also provided new insights enriching the field of teledermatology in terms of the factors that patients value most. This chapter will discuss the results of this study from theoretical and managerial point of views, along with discussing the limitations and setting the direction for future research. The subsequent chapters include theoretical implications, which delves into the previous research while introducing valuable insights into the field of teledermatology. This chapter is followed by managerial implications offering insights to enhance remote dermatological services and improve patient experience. Limitations of this research are then presented and discussed, emphasizing the need for future research to improve generalizability and to explore the technological opportunities presented by different teledermatology methods.

5.1 Theoretical implications

Previous research has shown that the service themes of the SERVQUAL framework are suitable for measuring patient satisfaction in healthcare (Tripathi & Siddiqui, 2018; Pekkaya et al., 2019; Al-Neyadi et al., 2018). The interviews revealed that patients value reliability in teledermatology the most compared to other service themes. The least valued theme among the five service themes was empathy. Responsiveness, accuracy, and up-to-date technology were situated between the two themes mentioned above and were perceived as equally important. However, the average value differences between the five service themes were minor and thus, it is not necessarily useful to rank the themes in strict order of importance.

Therefore, the results of this study suggest that the service themes of the SERVQUAL framework are also applicable to teledermatology, as the average importance reported by the patients was high for all of them. In addition, the interviews revealed how patients valued the up-to-dateness of the technology used in teledermatology and generally emphasized technological features as part of the experience. Technology being enabling factor in teledermatology, its seamless functioning is naturally seen as a crucial factor affecting patient satisfaction. As also verified in the previous research, slow internet speed and poor network signal have been found to act as barriers when adopting telemedicine (Almathami et al., 2020). When utilized in teledermatology context, it could be useful to extent the SERVQUAL framework to include a technological perspective, since it plays a significant role in the field and is highly valued theme among patients. In addition, one factor that differs from previous literature in relation to perceived important factors related to the technology used in teledermatology was doctor's innovative and problem-solving approach to technology-related issues.

Furthermore, the fact that dermatology is often experienced as a sensitive field of healthcare revealed how patients experience the telemedicine environment in this kind of healthcare context. According to previous research reliability and trust have been experienced as important elements in telemedicine as well in traditional healthcare (Safran et al., 1998; Mainous et al., 2004; Thom et al., 1999; Paul & McDaniel, 2004). However, the significance of this element may be more emphasized when the level of sensitiveness of the ailment is higher. This claim is in line with the results of the study, since while all the elements were perceived as important, the perceived importance of reliability in teledermatology was slightly higher than the other elements. When it comes to the factors enhancing the feeling of reliability in teledermatology, having video connection during the remote consultation was most frequently mentioned by the patients and thus, it can be stated that video connection was one of the most important factors increasing the feeling of trust during remote consultations. According to the patients the ability to see the doctor, including his/her face gestures and body language gave them a secure and reliable sensation during the appointment. Concerning previous research literature shows that trust between actors is enhanced by face-to-face interactions (Bathelt & Turi, 2011; Storper & Venables, 2004) and video connection as a part of teledermatology allows some degree of face-to-face interaction to be maintained and may be therefore perceived as more reliable than teledermatology without any video connection. Another factor that was most frequently mentioned regarding reliability was doctor's attitude. This factor refers to the doctor's overall attitude towards the

patient's ailment, how seriously and respectfully the doctor took the ailment and how committed the doctor was to be solving the ailment. This finding is consistent with previous research which has found that doctor's attitude is an important factor in patient satisfaction in traditional in-person health care context (McKinley et al., 1997). Previous research has found that prior face to face encounter with the healthcare provider strengthens patients' trust towards telemedicine (Almathami et al., 2020). Interestingly, only one patient identified this as an important factor in building reliable teledermatology experience. The patient in question was an older person, and thus is it possible that age may be a factor. The younger generation may be more accustomed to making contact through virtual channels, which means that face-to-face contact to establish a trusting relationship is no longer necessary in the same way as it may have been in the past.

As regards responsiveness and empathy in teledermatology, the most frequently mentioned factors inside these both themes were doctor's communicational and interpersonal skills. In addition, when investigating the results across interview categories and service themes this factor was also significantly more frequently mentioned in patients' responses than all other factors. Doctor's communicational behavior and interpersonal skills can thus be stated as a significant factor affecting patient satisfaction in teledermatology context. This factor entails the way doctor speaks and listens the patient, doctor's social skills and sense of humor, the ability to create a sense of calmness and the doctor's presence and undivided attention during the remote consultation, and the way of contacting the patient at the beginning of the remote consultation. Doctor's communicational behavior and interpersonal skills have been found to be important factors regarding patient satisfaction in local dermatology practices (Renzi et al., 2001) and in general healthcare (Clever et al., 2008). Thus, it can be stated that despite the context, this factor is highly valued by patients in the field of healthcare, whether the appointment is executed remotely or locally. However, ways of facilitating smooth interaction and communication between doctor and patient can be emphasized in teledermatology when the physical aspect is missing.

Regarding the level of assurance during teledermatology, the most mentioned factors among the responses were doctor's diagnostic skills along with doctor's comprehensive profile in the booking system. This factor can be considered as self-explanatory, since often tangible evidence of one's professionalism and education through certifications and diplomas contributes to the impression of one's competence.

When it comes to the chosen appointment format, one interesting point emerged from the interviews. Several patients reported a preference for in-person consultations when they

have a new and unfamiliar ailment, and opting for remote consultation in situations where the ailment is somehow familiar. This may be an indication that patients are still more reliant on physical consultation and do not fully trust diagnosis from pre-sent pictures alone. In the field of healthcare, the phenomenon can be interpreted as related to trust in technology-driven methodologies, which could be more pronounced when it comes to one's own health.

5.2 Managerial implications

The results of this study offer valuable insights into the field of dermatology and overall health care to better design remote services in order to meet patient expectations and to offer patients the best possible experience. As the results show, the reliability of teledermatology can be increased by having video connection as a part of remote consultation. Therefore, it can be suggested that to provide patients with the most reliable teledermatology experience as possible, it might be useful to consider to whether the provision of remote consultations via telephone without any video connection is worthwhile in terms of patient satisfaction. Another suggestion could be their use in situations, where the required level of reliability of the remote consultation is low. In addition, as revealed by the interviews, teledermatology was primarily sought for cases where the ailment was already familiar. Although during the interviews this aspect was generally revealed outside the reliability theme, it can be assumed to be at least partly related to patients' trust in technology, which is emphasized when dealing with an unknown condition. To ensure a reliable experience for patients, it is useful to consider the availability of in-person consultations for new conditions.

Doctor's communicational behavior and interpersonal skills being highly valued factor regarding teledermatology experience, deepening the sense of responsiveness, empathy, and improving overall patient experience. Therefore, when designing remote dermatological care, these factors should be carefully considered. However, even though communicational and interpersonal skills are highly influenced by one's personality and character, they can also be trained (Sato et al., 2019). Offering training for doctors to enhance their capability to provide better experience for patients is something that dermatological health care providers should consider.

When it comes to the technology used in teledermatology, it is crucial to ensure up-to-date, high-quality equipment and secure stable connections to ensure that patient contentment is met. In the instance that the technology is being employed is below standard and the connections are unstable, it may be the best interest of the patient to consider a local,

in-person appointment rather than opting for tele dermatology. In this situation, it is useful to assess the prioritisation of customer satisfaction over cost savings.

5.3 Limitations and future research

The research data for this study was gathered through semi-structured patient interviews which makes it the main methodology for this study. However, the methodology also created some limitations for the research. Although this methodology approach allowed to explore issues in depth with individual respondents, it also set limits to the sample size of the research. It should be noted therefore, that the scope of the interviews was limited in terms of the sample size of the participants. In addition, all the interviewed respondents were patients of one dermatological clinic. For this reason, the results of the study should be examined critically, taking the above points into account. Furthermore, to ensure greater generalizability in future research, it is recommended that a larger sample size of interviewees be used, drawn from multiple dermatologist clinics. In addition to the sample size, this research was conducted from patients' point of view and discusses the important factors merely from the perspective of the party that receives the dermatologist care. The field of research would benefit from implementing the same research design for investigating the perceptions, experiences, and opinions of healthcare providers.

Another limitation for this study was caused by the interview protocol. As discussed earlier in the methodology chapter (Chapter 3) the interview protocol consisted of preliminary questions, open-ended questions and assisted open-ended questions that were derived from the service themes of SERVQUAL framework. Although the interview protocol included these three sections, the questions were more focused on the last section of the interview, with a total of five main questions while the previous section contained only one main questions. This was a conscious decision, which is further discussed earlier in the methodology chapter, but at the same time it means that the interviews were largely focused on discussing the factors patients value in tele dermatology around the service themes of SERVQUAL framework. There exists a possibility for future research to investigate the important factors in tele dermatology regarding patient experience from a more general point of view, and designing the interviews in a way that it does not rely too much on the external guidance on patients' thinking process. In addition, other frameworks than SERVQUAL should be utilized when investigating patients' perspectives, experiences and opinions regarding tele dermatology to gain an in-depth understanding of the tele dermatology experience.

Furthermore, although this study focused on investigating patients' perspectives, opinions and experiences in teledermatology, the results were mainly concerning the live-interactive method and the store-and-forward method received unfortunately less attention during interviews. This may be due to the fact that the store-and-forward method is very technology-oriented, and thus patient satisfaction and experience may be more concerned with technical aspects such as seamless system usability and high-quality symptom pictures that enable diagnosis without a physical examination. Therefore, compared to live-interactive method of teledermatology, it contains a limited number of elements affecting patient satisfaction and experience, whereas the live-interactive method can be seen to include a wider variety of factors and elements. This phenomenon can also be seen in previous research, where patients' experiences with the store-and-forward method as a part of teledermatology have not been studied widely. Future research would benefit greatly investigating what technological opportunities store-and-forward method has to offer regarding patient experience. For example, in purely image-based settings and certain limitations, artificial intelligence algorithms have demonstrated performance equal or superior to that of humans (Jutzi et al., 2020). AI based tools will certainly facilitate the work of dermatologists in the future, both in teledermatology and in traditional in-person care.

6 Conclusion

This research focused on exploring factors influencing patient satisfaction in teledermatology, and has yielded valuable insights, providing both confirmation of existing knowledge and novel contributions to the field. Through semi-structured interviews with patients engaged in remote dermatologist consultations, this study addressed two fundamental research questions: the factors patients value most in teledermatology and the significance of SERVQUAL service themes. The study reaffirmed the applicability of the SERVQUAL framework in measuring patient satisfaction in teledermatology. Among the five service themes, reliability emerged as the most valued, while empathy was deemed the least crucial. However, the differences in experienced average importance between the service themes were minor. Importantly, when utilized in teledermatology, the study suggests extending the SERVQUAL framework to include a technological perspective due to the significant impact of technology on patient satisfaction. Doctor's communicational and interpersonal skills emerged as the most frequently mentioned and significant factors affecting patient satisfaction, emphasizing the universal importance of effective doctor-

patient communication across both remote and in-person healthcare settings. For healthcare providers, the findings offer actionable insights to enhance remote dermatological services and improve patient experience. Recommendations include prioritizing video connections to build trust, investing in doctors' communicational skills for better responsiveness and empathy, ensuring up-to-date technology for seamless functioning, and carefully considering the trade-offs between cost savings and customer satisfaction. While the study contributes valuable knowledge, its limitations are acknowledged. The sample size, confined to one dermatological clinic, limits generalizability. Future research should aim for larger and more diverse samples across multiple clinics. Additionally, exploring healthcare providers' perspectives and experiences, adopting different research designs, and investigating the store-and-forward method of teledermatology are avenues for further exploration. The future of teledermatology lies in a comprehensive understanding of patient and provider perspectives. By addressing these aspects, healthcare providers can refine their strategies, ensuring that teledermatology continues to meet the evolving expectations and preferences of both patients and healthcare professionals.

References

- Adams, W. C. (2015). Conducting Semi-Structured Interviews. *Handbook of Practical Program Evaluation: Fourth Edition*, (August 2015), 492–505.
- Ahmed, F., Burt, J., & Roland, M. (2014). Measuring patient experience: Concepts and methods. *Patient*, 7(3), 235–241.
- Almathami, H. K. Y., Win, K. T., & Vlahu-Gjorgievska, E. (2020). Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: systematic literature review. *Journal of medical Internet research*, 22(2), e16407.
- Al-Adwan, S. Market Analysis -5 th International Congress on Dermatology and Trichology Market Analysis Anonymous 5th International Congress on Dermatology and Trichology, 2020.
- Al-Neyadi, H. S., Abdallah, S., & Malik, M. (2018). Measuring patient's satisfaction of healthcare services in the UAE hospitals: Using SERVQUAL. *International Journal of Healthcare Management*, 11(2), 96–105.
- Andrees, V., Klein, T. M., Augustin, M., & Otten, M. (2020). Live interactive tele dermatology compared to in-person care—a systematic review. *Journal of the European Academy of Dermatology and Venereology*, 34(4), 733-745.
- Bathelt, H., & Turi, P. (2011). Local, global and virtual buzz: The importance of face-to-face contact in economic interaction and possibilities to go beyond. *Geoforum*, 42(5), 520-529.
- Chang, L.W., Njie-Carr, V., Kalenge, S., Kelly, J.F., Bollinger, R. C. & Alamo-Talisuna, S. (2013) Perceptions and acceptability of mHealth interventions for improving patient care at a community-based HIV/AIDS clinic in Uganda: A mixed methods study, *AIDS Care*, 25:7, 874-880.

- Clever, S. L., Jin, L., Levinson, W., & Meltzer, D. O. (2008). Does doctor–patient communication affect patient satisfaction with hospital care? Results of an analysis with a novel instrumental variable. *Health services research*, 43(5p1), 1505-1519.
- Donaghy, E., Atherton, H., Hammersley, V., McNeilly, H., Bikker, A., Robbins, L., ... & McKinstry, B. (2019). Acceptability, benefits, and challenges of video consulting: a qualitative study in primary care. *British journal of general practice*, 69(686), e586-e594.
- Eedy, D. J., & Wootton, R. (2001). Tele dermatology: a review. 696–707.
- Gagnon, M.P., Patrice Ngangue, P., Payne-Gagnon, J., Desmartis, M., m-Health adoption by healthcare professionals: a systematic review, *Journal of the American Medical Informatics Association*, Volume 23, Issue 1, January 2016, Pages 212–220, <https://doi.org/10.1093/jamia/ocv052>
- Gajarawala, S. N., & Pelkowski, J. N. (2021). Telehealth Benefits and Barriers. *Journal for Nurse Practitioners*, 17(2), 218–221.
- Gilmour, E., Campbell, S. M., Loane, M. A., Esmail, A., Griffiths, C. E. M., Roland, M. O., ... Wootton, R. (1998). Comparison of teleconsultations and face-to-face consultations: Preliminary results of a United Kingdom multicentre tele dermatology study. *British Journal of Dermatology*, 139(1), 81–87.
- Hadeler, E., Gitlow, H., & Nouri, K. (2020). Definitions, survey methods, and findings of patient satisfaction studies in tele dermatology: a systematic review. *Archives of Dermatological Research*, 313(4), 205–215.
- Hadwich, K., Georgi, D., Tuzovic, S., Büttner, J., & Bruhn, M. (2010). Perceived quality of e-health services: A conceptual scale development of e-health service quality based on the C-OAR-SE approach. *International Journal of Pharmaceutical and Healthcare Marketing*, 4(2), 112–136.

Henry, B. W., Block, D. E., Ciesla, J. R., McGowan, B. A., & Vozenilek, J. A. (2017). Clinician behaviors in telehealth care delivery: a systematic review. *Advances in Health Sciences Education*, 22, 869-888.

Jutzi, T. B., Krieghoff-Henning, E. I., Holland-Letz, T., Utikal, J. S., Hauschild, A., Schadendorf, D., ... Brinker, T. J. (2020). Artificial Intelligence in Skin Cancer Diagnostics: The Patients' Perspective. *Frontiers in Medicine*, 7(June).

Kraai, I.H., Luttik, M.L.A., de Jong, R.M., Jaarsma, T., Hillege, H.L. (2011). Heart Failure Patients Monitored With Telemedicine: Patient Satisfaction, a Review of the Literature. *Journal of Cardiac Failure*, Vol 17 No. 8 2011.

Kupfer, J. M., & Bond, E. U. (2012). Patient Satisfaction and Patient-Centered Care: Necessary but Not Equal. *JAMA*, 308(2), 141–146.

Ladhari, R. (2009). A review of twenty years of SERVQUAL research. *International journal of quality and service sciences*.

Larson, E., Sharma, J., Bohren, M. A., & Tunçalp, Ö. (2019). When the patient is the expert: Measuring patient experience and satisfaction with care. *Bulletin of the World Health Organization*, 97(8), 563–569.

Leisen, B., & Hyman, M. R. (2004). Antecedents and consequences of trust in a service provider: The case of primary care physicians. *Journal of Business Research*, 57(9), 990-999.

Mainous III, A. G., Kern, D., Hainer, B., Kneuper-Hall, R., Stephens, J., & Geesey, M. E. (2004). The relationship between continuity of care and trust with stage of cancer at diagnosis. *cancer*, 13, 14.

Mason, A. N. (2022). The Most Important Telemedicine Patient Satisfaction Dimension: Patient-Centered Care. *Telemedicine and E-Health*, 28(8), 1206–1214.

McKinley, R. K., Manku-Scott, T., Hastings, A. M., French, D. P., & Baker, R. (1997). Reliability and validity of a new measure of patient satisfaction with out of hours primary medical care in the United Kingdom: development of a patient questionnaire. *Bmj*, 314(7075), 193.

Mehrtens, S. H., Shall, L., & Halpern, S. M. (2019). A 14-year review of a UK teledermatology service: experience of over 40 000 teleconsultations. *Clinical and experimental dermatology*, 44(8), 874-881.

Nguyen, M., Waller, M., Pandya, A. et al. A Review of Patient and Provider Satisfaction with Telemedicine. *Curr Allergy Asthma Rep* 20, 72 (2020).

Parasuraman, A. (2000). Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of Service Research*, 2(4), 307-320.

Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. 1988, 64(1), 12-40.

Patient interviewees #1 - #9, anonymous, via telephone

Paul, D. L., & McDaniel Jr, R. R. (2004). A field study of the effect of interpersonal trust on virtual collaborative relationship performance. *MIS quarterly*, 183-227.

Pekkaya, M., Pulat İmamoğlu, Ö., & Koca, H. (2019). Evaluation of healthcare service quality via Servqual scale: An application on a hospital. *International Journal of Healthcare Management*, 12(4), 340–347.

Renzi, C., Abeni, D., Picardi, A., Agostini, E., Melchi, C. F., Pasquini, P., ... & Braga, M. (2001). Factors associated with patient satisfaction with care among dermatological outpatients. *British Journal of Dermatology*, 145(4), 617-623.

Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers*. Wiley-Blackwell.

- Saldaña, J. (2015), *The Coding Manual for Qualitative Researchers*, Sage, Thousand Oaks, CA.
- Safran, D. G., Taira, D. A., Rogers, W. H., Kosinski, M., Ware, J. E., & Tarlov, A. R. (1998). Linking primary care performance to outcomes of care. *Journal of family practice*, 47, 213-220.
- Sanders, C., Rogers, A., Bowen, R. et al. Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study. *BMC Health Serv Res* 12, 220 (2012).
- Sato, K., Nakamuro, M., & Owan, H. (2019). The Effect of Interpersonal Skills on Worker Performance. *RIETI Discussion Paper Series*, 19–045.
- Schnall, R., Higgins, T., Brown, W., Carballo-Diequez, A., & Bakken, S. (2015). Trust, perceived risk, perceived ease of use and perceived usefulness as factors related to mHealth technology use. *Studies in health technology and informatics*, 216, 467.
- Storper, M., & Venables, A. J. (2004). Buzz: face-to-face contact and the urban economy. *Journal of economic geography*, 4(4), 351-370.
- Thom, D. H., Ribisl, K. M., Stewart, A. L., & Luke, D. A. (1999). Further validation and reliability testing of the Trust in Physician Scale. *Medical care*, 37(5), 510-517.
- Tripathi, S. N., & Siddiqui, M. H. (2018). Assessment of the quality of healthcare services using servqual approach: A letter. *International Journal of Healthcare Management*, 13(8), 1–2.
- Ward, K., Gott, M., & Hoare, K. (2015). Participants' views of telephone interviews within a grounded theory study. *Journal of Advanced Nursing*, 71(12), 2775–2785.

Warshaw, E. M., Hillman, Y. J., Greer, N. L., Hagel, E. M., MacDonald, R., Rutks, I. R., & Wilt, T. J. (2011). Teledermatology for diagnosis and management of skin conditions: A systematic review. *Journal of the American Academy of Dermatology*, 64(4), 759-772.e21.

Whited, J.D. (2006), Teledermatology research review. *International Journal of Dermatology*, 45: 220-229

Zundel, K. M. (1996). Telemedicine: History, applications, and impact on librarianship. *Bulletin of the Medical Library Association*, 84(1), 71–79.

Appendix A: Interview Outline

Interviews conducted in Finnish; **English translations included.**

Alustavat kysymykset/Preliminary questions

1. Olet osallistunut hiljattain Ihosairaalan etävastaanotolle. Mitä teknologiaa vastaanotossa hyödynnettiin (video, puhelu, kuvien lähetys)? **You have recently attended a remote consultation at Ihosairaala. What technology was used for the consultation (video, telephone, pre-sent pictures)?**

2. a. Oliko kyseessä ensimmäinen kertasi Ihosairaalan vastaanotolla vai oletko käynyt useamman kerran? **Have you previously attended a consultation at Ihosairaala or was this your first time?**
 - ☐ Jos useampi vastaanotto takana/**If several consultations have taken place:**
 - b. Millaiselle aikavälille vastaanotot ovat sijoittuneet? **What is the timeframe for the consultations?**
 - c. Ovatko vastaanotot olleet aina etänä vai sisältäneet myös kasvokkain tapahtuvia? **Did the consultations always take place remotely or did they include face-to-face appointments?**

 - ☐ Jos useampi etävastaanotto takana/**If several remote consultations have taken place:**
 - d. Ovatko etävastaanotot toteutettu aina samaa teknologiaa hyödyntäen? **Are the remote consultations always conducted using the same technology?**

3. Miksi päätit varata ajan etävastaanotolle? **Why did you decide to make an appointment for a remote consultation?**

4. Voisitko lyhyesti kertoa kokemuksestasi etävastaanoton suhteen? **Could you briefly talk about your experience with the virtual reception?**

Avoimet kysymykset/Open-ended questions

5. Mitä tekijöitä koet erityisen tärkeiksi etävastaanotossa? **What factors do you consider particularly important in remote consultations?**

Autetut avoimet kysymykset/Assisted open-ended questions

6. Osaatko nimetä tekijöitä, jotka mielestäsi tekevät etävastaanotosta luotettavan kokemuksen? Asteikolla 1-7, kuinka tärkeänä tekijänä pidät luotettavuutta osana etävastaanottoa? (1= ei ollenkaan tärkeänä, 7=pidän todella tärkeänä) **Can you name any factors that you think make remote consultations a reliable experience? On a scale of 1 to 7, how important do you consider reliability as part of the remote consultation experience? (1=not at all important, 7=highly important)**
7. Osaatko nimetä tekijöitä, jotka mielestäsi tekevät etävastaanotolla saadusta palvelusta täsmällistä ja huolellista? Asteikolla 1-7, kuinka tärkeänä pidät sitä, etävastaanottokokemus on täsmällinen ja huolellinen? **Can you name any factors that you think make the service you receive in a remote consultation prompt and diligence? On a scale of 1 to 7, how important do you think it is that your remote consultation experience is accurate and thorough?**
8. Osaatko nimetä tekijöitä, jotka saavat sinut vakuuttuneeksi lääkärin pätevyydestä ja taidoista etävastaanoton aikana? Asteikolla 1-7, kuinka tärkeänä pidät sitä, että lääkäri kykenee välittämään etävastaanoton aikana pätevyytensä ja taitonsa? **Can you name any factors that convince you of the competence and skills of the doctor during a remote consultation? On a scale of 1 to 7, how important do you think it is for a doctor to be able to communicate his/her competence and skills during a remote consultation?**
9. Asteikolla 1-7, kuinka tärkeänä pidät sitä, että etävastaanotossa käytetty teknologia on ajan tasalla? **On a scale of 1 to 7, how important do you consider the technology used in remote consultations to be up-to-date?**
10. Osaatko nimetä tekijöitä, jotka mielestäsi tekevät etävastaanotosta empaattisen kokemuksen? Asteikolla 1-7, kuinka tärkeänä tekijänä pidät sitä, että lääkäri kykenee välittämään etävastaanoton aikana empatiaa? **Can you name any factors that you think make remote consultations an empathic experience? On a scale of 1 to 7, how important do you think it is for a doctor to be able to convey empathy during a remote consultation?**

Appendix B: Patient Vignettes

Vignette 1

An older woman, presumably retired, living outside the metropolitan area, had a second remote dermatology consultation. Sees remote consultations as an initial option for less severe conditions, stressing the need for clear instructions to decide if a physical visit is necessary, recognizing the value of remote consultations when physical appointments are impractical.

Trust in remote consultations was highly important to her, to be able to see the doctor and the doctor's dedication to trying to solve and interpret the ailment along with getting clear maintenance instructions or follow-up steps on how to deal with the ailment. The quality of video connection and the doctor's demeanor significantly influenced her perception of the consultation's promptness and diligence. The doctor's ability to convey competence and expertise was crucial, both through their profile and speech. Up-to-date technology, high-quality images, reliable video connections, and minimal disruptions were essential for her. The doctor's attitude, body language, and undivided attention played a role in conveying empathy during a remote consultation.

Vignette 2

Young woman, experienced technical issues with the video connection and had a remote consultation over the phone. She had limited trust in remote consultations and reserved them for prescription renewals or decision-making about physical appointments.

Trust was vital to her, and she emphasized the need for improved security measures. Prompt and diligent service was highly important, with a focus on the overall ailment process. The patient stressed the doctor's competence in listening, image interpretation, and respectful attitude. Up-to-date technology was important, but she appreciated doctor's adaptability when the video connection failed. The patient valued doctors conveying empathy and social skills during remote consultations.

Vignette 3

The patient, a woman in her 40s living in Sweden, had a remote dermatology consultation after a prior physical appointment. She had previous unsatisfactory remote consultations but had a positive experience with symptom pictures and rapid diagnosis via video.

Trust in remote consultations was crucial for her, enhanced by the booking process, confirmation emails, and the doctor's visible presence. Promptness and diligence were highly important, with an emphasis on the doctor's full attention, proper preparation, and attire.

A noise-free environment and the doctor's full attention were important for conveying competence and skills. She thought that up-to-date technology was necessary for effective remote consultations. The patient highlighted the role of video connection in fostering empathy through face-to-face interaction and attentive listening.

Vignette 4

The patient, a man in his early 30s, had a positive experience with his first remote dermatology consultation. He viewed remote consultations as comparable to face-to-face visits for familiar and moderate symptoms.

Trust was crucial to him, relying on the doctor's comprehensive profile and punctuality. He emphasized the importance of receiving appointment confirmation messages for promptness and diligence. The patient believed that a doctor's competence could be effectively conveyed through their profile. Up-to-date technology and high-quality video connections were highly important to him. He also stressed the importance of a doctor's social skills, reception of the patient, and overall attitude for conveying empathy.

Vignette 5

The patient, a young man, found his first remote dermatology consultation convenient and straightforward. He emphasized the importance of good-quality video and technology proficiency.

Trust was quite important to him, relying on video communication (to identify the doctor as the person for whom the appointment has been made) and their speaking manner. Promptness and diligence, along with the doctor's competence, were considered significant.

He thought that up-to-date technology was necessary for effective remote consultations. The patient prioritized ailment resolution over empathy during remote consultations.

Vignette 6

The patient, a woman in her 40s and an experienced remote consultation patient, chose a telephone-based dermatologist appointment due to her busy schedule and cost-effectiveness. She stressed the importance of reliable technology, including stable internet or telephone connections.

Trust was vital for her, especially for sensitive issues, with an emphasis on a calm, private atmosphere during remote consultations. Promptness and diligence were important for her, along with doctors articulating their actions during video appointment. The patient believed competent and skillful doctors could convey their abilities similarly in remote consultations than in in-person appointments. Cutting-edge technology was crucial, along with the doctor's proficiency with the technology. She considered empathy moderately important, with initial patient contact being a key factor for improvement.

Vignette 7

The patient, a young woman in her twenties, had her first remote dermatologist consultation after a recent in-person visit. She appreciated the convenience of sending pictures and the doctor's ability to assess her condition through video.

Trust was significant to her, and she emphasized the need for the doctor to take her condition seriously. Promptness and diligence were important, with a preference for comprehensive investigations. The patient believed the doctor's preparation impacted the perception of competence and skill during the remote consultation. Doctor's ability to convey competence and skills was essential to her. While she considered technology moderately important, she had a positive experience despite technical issues. The patient valued the doctor's ability to make her feel heard and considered conveying empathy very important.

Vignette 8

The patient, a man in his 50s, had a positive experience with his first dermatologist remote consultation, opting for it due to prompt availability. He chose a text description over photos due to unchanged symptoms and the complexity of uploading pictures.

Trust was quite important to the patient, and he believed it hinged on the doctor's personality and a prior physical meeting to establish genuine trust. Promptness and diligence were also quite important to him, and he suggested thorough notes in patient records to revisit discussed issues easily. The patient believed a doctor's competence and skillfulness were reflected in their ability to genuinely listen and interpret the ailment correctly. Up-to-date technology was moderately important to him. He valued empathy in remote consultations, emphasizing genuine honesty, open discussion, and the importance of doctors possessing empathic skills and situational awareness.

Vignette 9

The patient, an older woman, attended a remote dermatologist appointment from her summer house, choosing it for convenience. She had the option to send symptom pictures but chose not to due to the stabilization of her condition. A prior doctor-patient relationship, comprehensive records, and punctual service were vital to her in remote consultations.

Trust was extremely important to the patient, relying on prior familiarity with the doctor, their attitude, diagnostic skills, and thoroughness. Promptness and diligence, along with holistic care, were of utmost importance to her. She believed doctor competence was conveyed through detailed questions and calm, unhurried atmosphere. Up-to-date technology was highly important to her. Empathy was a cornerstone of her expectations, with a strong emphasis on a patient-centered experience. In her opinion, doctors should exhibit genuine presence, social skills, and even humor, especially for long-term conditions, to convey empathy effectively.