Service quality in telemedicine
A service evaluation of Europe's largest digital healthcare provider

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Bachelor Programme in International Business Administration
2023

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Abstract

**Purpose** - This thesis strives to conduct a service quality evaluation of the telemedicine provider KRY to find out what factors in telemedicine service are influencing the performance the most. The research uses KRY as a reference point to find the factors in said service provider but also to help the entire industry of digital healthcare.

**Research design, data, and methodology** - This thesis is a quantitative study that uses Parasuraman's SERVQUAL model. The thesis is conducted through the use of a questionnaire by snowball sampling 33 participants who have utilized the telemedicine provider KRY. Analysis was conducted by extracting the data ratings of the likert-scaled questionnaire and conducting a paired t-test on the data.

**Result** - This thesis found Kry to be performing very well in terms of service quality, meeting patient expectation on all dimensions and exceeding expectations in the tangibility dimension

**Keywords** - Service quality, Consumer satisfaction, Telemedicine, KRY, SERVQUAL,
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1. Introduction

Chapter one will cover the background of the chosen topic. The chapter starts with a background that explains the current situation by introducing the area of study to the reader and defining key concepts and definitions. Following the background comes the problem discussion where we go through the present problem within the topic and present the research questions.

Telemedicine has grown immensely in the last couple of years, much thanks to the Covid 19 induced quarantines that incentivized the adoption of digital healthcare to lessen the risk of contracting the virus (Bestsenny et al., 2021). It has since then also revolutionized the way patients seek medical attention and become a way of making healthcare more inclusive for those who are affected by healthcare barriers such as the distance between patient and clinic and lack of specialists in local areas leading to longer than normal waiting periods.

Nevertheless, nothing is perfect and must come with both strengths and flaws, therefore we seek to understand what kind of service impact the transformation from having in-person visits to remote digital ones has on consumers, by gaining a deeper understanding of the phenomenon we can gain an overview over telemedicine's service's strengths, weaknesses, and overall perceived quality of consumers.

1.1 Background

In this section, a background of our topic is presented to provide fundamental knowledge concerning telemedicine. The reader can expect to get essential insight into the topic area we have chosen and expect to gain a greater understanding of the topic. The background goes through the telemedicine history, services, current conditions, and the position of telemedicine today. The background aspires to introduce the topic on an underlying level for the reader to familiarize themselves with the topic area. This chapter seeks to clarify the concept of telemedicine and why it is a relevant industry to conduct a service evaluation.

According to the National Cancer Institute, the definition of the noun telemedicine is
the delivery of healthcare from a distance using electronic information and technology, such as computers, cameras, videoconferencing, satellites, wireless communications, and the internet (NCI, 2022).

The electric telegraph was invented in the 1840s during the time of the civil war and it completely revolutionized the way communication got passed across distance (Sigmunddev, 2021). The telegraph made it possible to prescribe medical supplies and transmit medical reports during the war. The innovation additionally allowed peers and doctors to consult and interact remotely.

Towards the end of the century, radio communications came to a rise. With the implementation of both telegraph and radio communication, doctors could now consult and diagnose patients despite the distance (Sigmunddev, 2021). In today's society, there are several digital healthcare providers out there, our study specifies the healthcare provider Kry, and considering how Kry has become one of the main digital healthcare companies in Europe we thought it was suitable to go with them (Pratty, 2021).

Kry was first founded in Sweden in 2014, and their service is now available in Norway, Germany, France, and the UK (Kry, n.d.). According to Kry's official website the CEO, Johannes Schildt faced difficulties in booking appointments for his ongoing health condition and eventually realized the potential of addressing these challenges. He recognized the issue of limited access to healthcare, the long waiting times, and other obstacles that people were facing and was inspired to improve the overall experience of receiving care, that's why he decided to go into the telemedicine industry with the telemedicine company (Kry, n.d.).

Telemedicine has been on the rise since and has helped revolutionize the healthcare industry and the way people seek and receive help (Sigmunddev, 2021). Due to its convenience, it mainly targets the elderly population and patients with geographical and financial difficulties (LeRouge & Garfield, 2013). As telemedicine is a rapidly growing field, it is essential to understand its impact on the final consumer and consumer experience.

The pandemic made normal in-person visits into potential health hazards due to the risk of contracting the covid virus (Bieritz, 2020). The use of digital platforms for remote meetings has grown incredibly in many industries as well as the health industry through telemedicine (Bestsennyy et al., 2021). Thanks to applications such as Kry, Doktor.se, and 1177 in Sweden the spread of the virus was kept at a lower rate by having people in need of medical attention receive their aid from home instead of
seeking out healthcare at their local center (Chauhan et al., 2020). Telemedicine integration allowed clinicians to offer people consistent access to healthcare when needed during the pandemic.

With the increase of the telemedicine industry over the years we as researchers are keen to know how good the service actually is compared to traditional healthcare which leads us to the service quality model otherwise known as SERVQUAL (SQ). SQ is a model that was first published in 1985 by three academic researchers measuring consumer perception of service quality (Parasuraman et al., 1988). The SQ model is empirically examined for its potential in measuring service quality in the healthcare industry and therefore SQ is often used by healthcare providers to assess their quality making it a suitable theory for our thesis (Altuntas et al., 2021).

However digital service can differ quite a lot from traditional in-person face-to-face service. Digital service can be more convenient and efficient than traditional as the customers can compare prices more easily and save time by not having to travel the distance to the location of the service provider (Hasselfeld, 2022). Typically there is no face-to-face contact which means that the traditional personal interaction which is typically evaluated as a very important stage of service can't be measured (van Riel et al., 2001). Self-service plays a larger part in digital service, often leading to a cooperative production of service made by both the provider and customer for the customer (Li & Suomi, 2009).

For that reason, we are going to adapt our model to the digital service that is being evaluated by introducing the electronic service quality model E-SERVQUAL (e-SQ). There is no consensus on the number of dimensions the scale has to have and neither which dimensions are to be included. Nevertheless, these six dimensions are the ones reoccurring consistently in other e-SQ studies. Reliability, responsiveness, ease of use, security, web design, and information quality (Ladhari, 2010). In the next section, we will focus on the problem discussion that will bring up the problems of the telemedicine industry regarding the customers’ perceived experience.

1.2 Problem discussion

In this section, the problem discussion will bring up the problems of the telemedicine industry regarding the customers' perceived experience. The reader can expect to gain an understanding of the problems associated with the rise of telemedicine use, what the thesis objective is regarding the purpose and research questions as well as what theory is going to be implemented. Reading the
problem discussion should give a greater understanding of what the goal is with this thesis and make it easier to understand why we have chosen to focus on certain things further down in the paper.

According to a study by Gordon et al. (2020), participants stated that they were left worried about the quality of the care after attending a clinical video telehealth (CVT) physical exam. The participant said they felt as though their physical exams were not reliable and exposed a higher risk of being wrongly diagnosed. The problem stated with the CVT was the fact that the assigned clinician only used their eyes to conclude whereas the participants would have felt more assured with a traditional visit where touch is involved to confirm with more than one sense.

Furthermore, the same study had participants saying that the service provider was less attentive when undergoing a telemedicine exam, the problem according to Gordon et al. (2020) seems to be that eye contact cannot be replicated the same way it would be in digital calls due to angles which in turn leads to an impersonal encounter leaving the patient with the feeling that they were unheard and neglected. Speaking of not being heard, it was also reported that the challenge for patients to speak up is an issue for telemedicine users. Patients stated that they found it rather difficult to engage with the service provider in a conversation due to both the distance and the fact that the same provider working was under time pressure. The reason for their difficulty to speak to their service provider was also found in the presence of other service providers on the call.

Another issue according to the study conducted by Gordon et al. (2020) showed flaws in the relationship process between client and clinician. Patients reported feeling less comfortable during the call and were left with more doubt than what they typically felt in traditional in-person visits due to the lack of small talk and physicality.

Human interaction is an important component within healthcare as receiving both psychological and physical help is personal. Human factors such as empathy where human contact and communication are highlighted adapted to their greatest ability in telemedicine, however, it differs when service is not delivered face to face, therefore, the reason that some patients might feel more comfortable discussing private issues in person while others might find comfort in doing it virtually (Gordon et al., 2020).

We seek to narrow down the area of study to focus on the quality of the service that is provided by digital healthcare provider Kry. Therefore our research question is to find out how the digital healthcare provider Kry is measuring up compared to traditional healthcare in terms of service quality.
Through an evaluation of the electronic service contra the traditional, we can see where telemedicine thrives and where it lacks in its delivery. We will be using a model that will be explained in Chapter 2, said model will separate components of service and through separation clarity allows us to see where the service is prospering and where its flaws are. The results of this study can be used by the providers of said service to further improve the quality of digital healthcare and in turn, increase the adaptation of it. We will also gain more knowledge about what factors hinder superior satisfaction in not only digital but also traditional healthcare

This chapter discussed the existing barriers and concerns with telemedicine and customer experience. It is however necessary to identify and incorporate a theory into our discussion to contextualize it.
2. Literature review

This chapter is dedicated to the previous literature that is relevant to our thesis about the impact of telemedicine on consumer experience, here we will summarize other articles in hopes to gain an insight into what other studies and theories have shown reality to be and learning from them so that our study can further build upon the literature of telemedicine and overall accumulate more knowledge to the area so that action may be made. The reader can expect to learn about the importance of maintaining good service quality, the SQ model, how the model has been applied in recent years, and its criticism.

2.1 The importance of service quality

In a competitive business environment, the ability to satisfy a customer's needs is highly important to survive the ongoing market competition, without the ability to meet your customers' needs longevity is out of the question (Nguyen et al., 2018). According to Kim's (2013) study, meeting the needs of the customers is something that is very influenced by the service quality of the company, the study showed that if there is a gap between what is offered and what is needed the company must quickly resolve the issue of dissatisfaction or they will risk losing their customers as they will be substituted for another company that does satisfy its customers. A study by Ramlawati and Putra (2018) showed that only consumer-oriented organizations and those who can provide superior value to the customer will survive a competitive market, these companies who can provide a good quality service also tend to have customers who are less easily swayed by substitute services. Telehealth offers many benefits for the patient as it saves both time and cost making it highly convenient for many (Hasselfeld, 2022). Telehealth allows patients located in rural areas with provider shortages to receive the help and resources they need, the invention of digital healthcare has reduced both the waiting and travel time for the less fortunate making medical care more efficient (Gajarawala & Pelkowski, 2021).

To be able to have an idea if the healthcare provider is delivering good quality service they can dive into the customer's experience which in medical care refers to the way patients perceive the interaction and engagement with the doctor, both off and online (Team, n.d.). Measuring satisfaction amongst customers not only drives advancements in technologies forward but assures that demands are met and guarantees positive customer satisfaction (Team, n.d.).
In the next heading, we will go over a framework that will be used for evaluating the quality of service.

2.2 SERVQUAL (SQ)

The SQ model was made by Parasuraman, Zeithaml, and Berry (1988), and was designed to evaluate traditional face-to-face service quality delivery.

Parasuraman along with his colleagues the year 1985 found gaps that could be used to measure service quality, in his paper he identified five gaps that will be explained briefly below (Ramya, 2019).

Gap 1: Difference between consumer expectation and the perception managers had of what consumers expected

Gap 2: Difference between what perception managers had of consumer expectation and the service quality specification

Gap 3: Difference between service quality specifications and the actual service that was delivered

Gap 4: Difference between the service that was delivered and what is communicated to the consumers about the service

Gap 5: Difference between consumer expectations and perceptions

Gap 5 was the gap that intrigued the researchers the most and in 1988, only three years later an article was published where the famous formula \( Q = P - E \) was introduced. \( Q = P - E \) stands for the quality of service and is equal to the difference between the expectations of service and the perception of the actual service, perceived service - expected service = service quality (Grapentine, T. 1999).

**Dimensions:**

SQ consists of five original dimensions that together form the entirety of good service, these five dimensions are reliability, responsiveness, empathy, assurance, and tangibles (Ramya, 2019).

These five dimensions will be briefly explained below.

Reliability: The reliability dimension is traditionally evaluated by how reliable a service is by measuring its ability to be on time, provide good service, keep promises, and avoid committing errors Yarimoglu (2014).
Responsiveness: The responsiveness dimension is traditionally evaluated by how fast a service provider is to help a customer from the moment that customer reaches out, it seeks to measure quickness of response, aid and overall prompt service (Yarimoglu, 2014).

Empathy: The empathy dimension traditionally measures the ability of the service personnel to connect with its customers, meaning how well they can understand and help the customer with their problems (Ramya, 2019). According to Ramya (2019) this is measured by the customers' rating of how well the service providers met with them and how they addressed their emotions.

Assurance: The assurance dimension is measured by evaluating the level of trust customers have for the service provider and the level of confidence they have that the service personnel have the competence to complete the appointed tasks without error (Ramya, 2019). If a customer doesn't feel a high level of trust or confidence in the service then he might not be as inclined to purchase said service for the reason of the belief that it might be done incorrectly with errors resulting in customer dissatisfaction and overall lack of quality (Li & Suomi, 2009).

Tangibility: The tangibility dimension traditionally centers its attention on physical facilities, equipment, and the appearance of the staff meaning for a service to be doing well they should have up-to-date equipment, its physical facilities should be attractive to the eye, staff should dress properly (Yarimoglu, 2014)

Now that we have gone over SQ and its dimension we will begin on how it can differ when the service that is being evaluated is one that is provided electronically, in that case, the e-SQ can be a helping hand. When it comes to electronic services new dimensions are created and old ones are rebranded to adequately evaluate electronic services that differ from in-person services (Li & Suomi, 2009). Each study may differ in the amount and type of dimensions they use depending on the service. However most of SQ's original dimensions (reliability, responsiveness, empathy, tangibles, and assurance) are still very present in e-SQ measurements, some have kept their name and meaning with only slight changes to accommodate the electronic environment while others have needed to be translated to fit in (Li & Suomi, 2009).
Reliability: When used in e-SQ it still maintains the core themes but also incorporates modern issues such as availability, and having the website running consistently for example Ladhari (2010).

Responsiveness: In e-service it is similar but given the change of environment no direct interaction between consumer and staff is had, therefore a service must provide correct contact information, quickly respond to customers on the internet and be able to solve their problems (Li & Suomi, 2009).

Empathy: In electronic services there for the most part isn't any direct human interactions leading the dimension to be less relevant. Ladhari (2010) however states that there are some exceptions where empathy is one of the more important dimensions like services such as telemedicine where direct contact occurs and empathy still remains as relevant as ever.

Security (Assurance): The assurance dimension is translated into a new dimension when transitioning to electronic service called security. This dimension is very relevant and used frequently when evaluating electronic services (Li & Suomi, 2009). Can the customer trust the provider to protect their financial and personal data, are they regarded as a service with a good reputation?

Website design (Tangibles): This dimension instead of physical facilities and materials centers its attention on the aesthetic of the website design, how well-organized the user interface is, navigation, and its efficiency of downloads (Li & Suomi, 2009).

Ladhari (2010) mentions that e-SQ scales have to be tailored to the specific industry they are applied to, studies that utilize the e-SQ vary quite a lot in both the number of dimensions that are being used and the items included in those dimensions.

Why we have decided to keep the original five dimensions:
Reliability is for a good reason part of our scale, most studies that have used the framework have implemented it as one of their dimensions. It is crucial for a service provider in both digital and face-to-face businesses to have their customer's trust, without the customer's trust in that they will receive what they've been promised a service cannot be deemed a good one, this is especially true regarding healthcare providers as consumers are coming with questions regarding their health and nothing less (Gordon et al., 2020).
Responsiveness like reliability showed consistency in its relevance by how it was implemented by almost all other scales. It's important for a service provider to be able to quickly assist a customer, a customer that has to wait long periods of time will most likely become irritated and might even look for substitute services (Ramlawati & Putra, 2018). This is especially true when it comes to healthcare due to the fact that many patients come in worried and not seldom in pain. Many people feel as though they do not want to go to the emergency even though they are experiencing symptoms that need medical attention just because of the waiting time (Davenport et al., 2017).

Empathy is not that present in other e-service scales due to the lack of direct human contact, however, in the case of telemedicine patients and clinicians do meet and have direct contact. Taking this into account and what Gordon et al. (2020) found through participant responses, regarding patients feeling unheard, neglected, and having difficulty engaging with clinicians leads the dimension to be as relevant as before.

Assurance is a key dimension for the original SQ and in this case even though we've transitioned to electronic service. The customers perceived level of assurance is undoubtedly a key factor in them rating their service, especially in telemedicine as the study by Gordon et al. (2020) stated, patients felt unsure of their diagnosis because they lack assurance that the doctor will correctly diagnose them through a web camera, and therefore the quality of service was uncertain. Customers who don't have trust in the provider to be able to complete a task rightfully won't be as inclined to use that service.

Website design is the last dimension that we have chosen because it's a translation of the original dimension of tangibility (physical facilities, equipment, etc) and makes a comparison later in the analysis less complex than it has to be (Li & Suomi, 2009). The website is often the first impression a customer makes of the provider, a lower-quality website design can result in a negative impression of the provider and leave them less inclined to pursue further with the purchase (Li & Suomi, 2009). For the data collection, however, we will have website design and tangibles under the same dimension.

**Application:**
The SQ model is used by choosing a service and evaluating it by measuring the gap between what a consumer expects to receive from a service and how the consumer perceived the actual service to be when it was provided (Grapentine, T. 1999).
The SQ equation \([Q=P-E]\) stands for quality equal to perceived service subtracted by expected service. By having participants rate how they perceived the service and also rate what their expectation of that service was prior one can conclude through arbitrary evidence if it was a good, bad, or neutral service quality. Anything above zero is seen as superior service as the perception of the service was higher than their expectations and anything below zero is marked as an inferior service (Grapentine, T. 1999).

Although the SQ model's age, it is still very commonly used as a method of measuring and evaluating today's healthcare services (Pekkaya et al., 2017). Al-Neyadi et al. (2016) for example utilized the SQ model to measure patient satisfaction at the hospitals in the United Arab Emirates. They found out that private and public hospitals didn't have a significant difference in patient satisfaction and another more recent study where the SQ model was utilized was when Alomari (2020) conducted a study to evaluate the quality of healthcare services at five different private hospitals in Syria, using the SERVQUAL instrument to gather patients’ perspectives. The finding of the study proved to be reliable and valid in assessing service quality in the healthcare setting in Syria. The study indicated that the tangible dimension played a vital role in balancing the deficiency in other service quality dimensions and the communication skills of the staff needed to be improved.

Now that we have gone over the SQ model, its application, and how it's being utilized today, we will go over the criticism that the SQ model has received over the years in the next section of the literature review

### 2.3 Criticism of the SERVQUAL model

The SQ model has received a lot of attention over the years and with all that attention there comes those who criticize it, one specific critique that has reappeared throughout the years has been the generality of the five dimensions in the SQ model. Researchers have been questioning whether or not the SQ can be utilized across industries as services tend to differ quite a lot between providers (Haghighat, 2017). An example that was given in Haghighat's (2017) study was the airline business where difficulty in applying the SQ was present. The difficulty of the study was said to have stemmed from the uniqueness of the factors that play a part in customer satisfaction in airlines such as the comfort of the seats and airline meals whereas other services don't have the same trouble.
Haghighat (2017) criticized the SQ model for its approach to measuring expectations. People tend to indicate high expectation ratings while their perception scores rarely exceed their expectations, and when people indicate their expectations and perceptions of the service, there is a psychological constraint that people always tend to rate expectations higher than perceptions.

Another criticism of the framework is that its measuring of quality is inadequate due to participants being confused and or bored when answering leading to a flawed data set, and participants tend to build much of their perceptions of service by looking at their own subjective experiences of said service and their first expectation that service becomes difficult to validate leading to a flawed comparison between perceptions of service quality and expectation of service quality (Haghighat, 2017).

Carman (1990) criticized the SQ model for its use of two separate questionnaires to measure expectations and perceptions as different scores. This approach was considered inappropriate in terms of scale and reliability, as well as questionnaire length.

The study found it to be ineffective to compare expectations with perceptions to gain an understanding of service quality. Studies in support of this suggest that focusing solely on the performance of a service is enough (Haghighat, 2017).

### 2.4 Summary of literature review

This chapter went over the overall importance for a business to maintain and provide good service quality to survive in a competitive market. The literature review also introduced the service evaluation model, SQ, and its dimensions and explained how it has been adapted for the electronic market while also giving examples of how SQ is being used today and what critics have had to say over the years.

The upcoming chapter will be about the methodology of this thesis going over the purpose of this research, why we find it to be relevant, the approach we are going to take with it, and the strategy we will implement to gather the data.
3. Methodology

In this chapter, we will go through the Research purpose, approach, strategy, sample selection, collection, analysis, reliability, validity, and ethical consideration. Overall we will reveal our methodology choice for the thesis and go in-depth into why we chose what we chose and the purpose of it.

3.1 Research purpose

The research purpose serves as the red thread as well as the motivator for the study, it tells the reader what the thesis intends to accomplish (Ryan, 2023). By establishing an idea of what the purpose of the study will be, any unnecessary research will be avoided as it won't fit the framework of the purpose. Decision-making will also be made easier regarding method choice as the methods will be reviewed to see if they are appropriate for what the study seeks to find.

The purpose of conducting a survey can be very broad, it gives organizations an opportunity to receive feedback which allows stakeholders to speak their opinions and concerns which in turn builds trust between the organization and stakeholders (NBRI, n.d.). Surveys also give an assessment of performance so that organizations can gain an understanding of what level of service is being provided so they can ensure consumers are satisfied consistently and that there is ongoing improvement in their delivery of the service (NBRI, n.d.). However in this case the survey is grounded in a research purpose, we use the survey to gather data on expectations and perceptions to later analyze said data so we can make a conclusion

The overall purpose of this thesis was to find out what factors in telemedicine service are influencing performance the most. Through using Kry as a reference point for our participants we plan to not only find the factors that impact the most in said service provider but in the area of digital healthcare as well so that the service can be improved efficiently.

3.2 Research approach

In this section, we will go through and discuss our choice of approach and how we will proceed with our research. It is necessary to clarify our direction of approach when it comes to introducing and completing our methodology.
Our research takes a quantitative research approach, with a numerical survey. The nature of a quantitative research approach is more objective and logical than in a qualitative study and is a type of research that can test relationships and seeks to explain a certain phenomenon (Fleetwood, 2023). As the research purpose states, we sought to gain a deeper understanding of the perceived experience that consumers have had when they used digital healthcare instead of traditional in-person visits. A qualitative approach is traditionally the method of choice when wanting to understand a concept better while quantitative may be better suited when the purpose is to test and or confirm theories and or assumptions (Streefkerk, 2023).

Since our research focuses on the quality of service in a digital setting, we decided that a quantitative study is the most suitable approach for the study due to our approach of using numerical values and comparing them with each other to gain insight into where there are gaps.

### 3.3 Research Strategy

In this section, we will discuss our choice of research strategy and why we decided on that specific strategy to progress with. Explanatory research seeks to answer “why”- questions, trying to identify the causes and effects of the phenomenon that is being studied. Studying a situation to explain the connection between non-identical variables. Explanatory research is usually based on quantitative data to show the relationship between variables (Saunders, Lewis, & Thornhill, 2009). In this study, explanatory research was the best fit for this thesis because we did quantitative research to find out what factors in telemedicine service are influencing the performance the most by using Kry and to go with a quantitative study in the form of a survey.

Survey research is a method of collecting information through various responses to a set of questions, normally conducted through interviews or questionnaires (Ponto, J. 2015). We decided to do a questionnaire for our method as we found it the most suitable for our research. The reason for that is because questionnaires are best fitted for quantitative research and to show the relationship between variables (Saunders, Lewis, & Thornhill, 2009). A questionnaire is very agile, it can be completed in paper form, or digital form and sent out to people very easily. Ponto, J (2015) further explains that combining different methods of survey administration can also help encourage improved sample coverage as every individual in the selected population has a fair chance of participating.
In terms of the questionnaire, a self-made one, or internet-based survey are both efficient for a greater sample selection and low in cost (Ponto, J . 2015). The format of the questionnaire can be completed in paper form, electrically emailed, or by using tools and programs online. However, to make sure all individuals have an equal chance of inclusion and accessibility to the survey an online questionnaire will be made available.

3.4 Sample selection

This section of our study includes how we identified and selected the population we were focusing on for this research. As far as the survey, we limited it to only asking people who have previously used the telehealthcare provider Kry, The choice of how to select people for your survey depends on things like how many people you want to reach and how many you can reach. It's important to pick a method that can give you a fair and accurate sample of people so that your findings can apply to a larger group. Probability sampling is most used in survey-based research strategies (Saunders, Lewis, & Thornhill, 2009). However, when conducting survey-based research, we focused on probability sampling in this thesis. Probability sampling was a good choice because it ensures that every member of the target population has an equal chance of being selected for the survey and we focused on simple random sampling. Simple random sampling is when selecting the sample at random, the target has an equal chance of being selected (Saunders, Lewis, & Thornhill, 2009).

Since we are currently located in Luleå, we reached out to people that we know here students primarily of the ages 21-36, we have asked these same people to share with their friends and family who they believe have tried the service. Due to the questionnaire being online, we could also reach out to further participants through social media, mainly on platforms such as Instagram and Facebook. This we believe facilitated both parties and saved both time and effort by doing the survey online. The age range varies between 20-54 years old, including all genders.

We have the age floor at 20 years old and not younger because according to Savage (2022) up until the age of 18-19 years old most people in Sweden still live at home with their parents and their parents work as caregivers. We believe that young people living under the roof of their parents aren't taking as much responsibility as the ones who have moved out and therefore aren't as knowledgeable of the process of seeking healthcare. For that reason, we believe that ages below 20 years won't have been as
inclined to have sought out healthcare of their own and therefore lack the experience we sought for this research. We believed this was an appropriate age group for our study in order to ensure fair and appropriate data. In total, we sent out questionnaires with questions relating to the experience of telehealth using the platform Kry.

3.5 Data analysis

This section seeks to examine and analyze the collected data from our surveys. We started by taking every single question and accumulating all the participant responses meaning their given rating to calculate the mean of all responses to each question. Then we separated the means by having them separated in two paired columns, perception, and expectation. The separation was done swiftly as each question is linked as a pair and easily identifiable as a question seeking to measure perception (“your experience”) and a question seeking to measure expectation (“how likely”). By accumulating the means of the perception questions and expectation questions and then having them separated we started the analytic process by doing a paired t-test to see if the means between perception and expectation was zero or not (JMP, n.d.). A paired t-test is a test that is utilized to find out if the difference between two means is actually zero meaning that the difference is something derived from chance and not a true statistical difference, therefore it suits the goal of this thesis by the means of it reassuring us that the observations we make in the comparison are statistically true (Statistics Solutions, 2022). To begin the process of a t-test we had to start off with two competing hypotheses, a null hypothesis that said that there was no difference between the compared means and an alternative hypothesis that said that there was a statistical difference (Statistics Solutions, 2022). We measured the p-value through the use of Google spreadsheets which allowed us to see if we could or could not reject the null hypothesis. If the p-value was less than alpha (0.05) the alternative hypothesis could be supported and the null rejected. After this, we counted the mean of all dimension items as you can see in the gap analysis in chapter 5.2. By combining the mean of the items and separating it into their respective dimensions we could begin to measure the difference in the means of perception and expectation of each dimension. The difference in the means gives us the ability to measure the standard deviation of the differences and calculate the t-value in a paired t-test. Through having the standard deviation of the difference we also calculated the standard error of deviation which we used to calculate the confidence interval to see if the null value is within the interval or not so that we could come to a conclusion regarding the rejection or failed rejection of the null hypothesis.
3.6 Reliability and validity

This section will cover the reliability and validity of our survey. First, define the two criteria of measurement and then understand these important terms and how they are considered and treated in our research approach. Reliability is considered the measurement of how likely the result is to be replicated given the same test was to be conducted under similar circumstances (Middleton, 2023). Validity is the way of measuring how accurate the method truly is in measuring that which is sought to be measured (Middleton, 2023).

The empirical data attempts to analyze and answer the research question about the service quality of Kry. It is therefore important to ensure that the data is correct and relevant to the studied phenomenon (Lind R, 2019). Due to the standardized and systematic nature of questionnaires, the reliability of the study is high. It is however necessary for us to describe and clarify the content of the research to enable better responses. It is also important to avoid any unintended biases through the way we choose to organize and present our survey (Ponto, J. 2015).

Surveys are a valid method for investigating concepts and variables of concern (Ponto, J. 2015). Just like any other method, surveys can be vulnerable to errors. Yet, there are several approaches one can take in order to minimize these errors from occurring. Addressing these flaws in digital questionnaires can help enhance the validity and reliability of our study.

By utilizing a formula called Cronbach's alpha we can measure the reliability of our survey (Moore et al., 2020). Cronbach's alpha will show the relation between questions in the questionnaire in measuring the same thing. Cronbach's alpha is a measurement between 0 and 1, higher scores indicate greater reliability and lower scores indicate lesser reliability. If our survey turns out to show low reliability we will increase the reliability by making sure by removing unnecessary questions that don't contribute to the measurement and include relevant ones that measure the same thing. By obtaining a higher Cronbach's alpha before sending the questionnaires we can be more confident in what the data shows.

To increase validity even more we will be utilizing something called face validity which is a simple way of measuring the overall validity of a test (Bhandari, 2022). This measurement of validity focuses on making sure that the questions of the survey are relevant to what it is that the thesis seeks to measure, appropriate for the participant, and adequate for its purpose. A good level of face validity
would mean that those who see the survey would agree that it measures what it's supposed to measure, and a lower level of face validity would indicate that they do not understand what is being measured and why the method has been chosen.

3.7 Ethical considerations
In this section, ethical considerations are being lifted. It is important for us to follow ethical principles to assure the rights, well-being, and dignity of the participants. It is crucial for us to take these considerations seriously in order to protect those involved and make sure standards are being upheld. All participants in our research are participating out of a free choice, they can all withdraw from the study whenever they feel like it, data progress made with the participant may always be terminated for the comfort of the person if so sees fit. All participants will be briefed on what the research is about before engaging in any activity, asked if they have questions, and finally asked for their consent to be a part of the study. We are able to conduct the study with complete anonymity due to multiple reasons however, we will proceed with confidentiality meaning that anyone taking part will have no identifying trace on the final result. We have regarded the possibility of harming our participants intensely, whether psychologically, socially, physically, or legally but expect no such thing to be of risk due to the nature of our thesis. If it however turns out to happen we will provide our participants with appropriate information about services they may turn to for help.

Regarding plagiarism and research misconduct, we take crediting the rightful researcher very seriously as we don't want to benefit from another researcher's work and harm them in the process by taking their credit. Our purpose of this thesis lies in the nature of gaining more knowledge of the service quality in the telemedicine area and potentially finding findings that may improve it and other similar digitized industries that are and will be. Therefore research misconduct is in complete opposition to the goal and something we can assure will not be presented in any part of the text.

3.8 Generating the questionnaire
We generated our questionnaire through the usage of Google Forms, there through the system of entering questions we entered the basic demographics such as age, gender, and general health status as multiple choice questions to gain an idea of the sample demographics. Using Google Forms was the easiest due to familiarity with Google apps like Google Drive, Documents, and Slides, nevertheless,
the synchronization between the Google apps also increased our inclination to have used Google Forms in our work. After completing the first three questions regarding demographics we moved on to transforming each item of the five dimensions into 5-point scale question pairs where we started with asking the participant to rate their expectation of the item and followed up with a new question asking the participant to rate the experience (perception) of said item in the telehealth environment through the healthcare provider Kry. Thereafter once the questionnaire was done it was sent out through social media platforms and gained participants' answers through snowball sampling. The data that was collected was sent to Google Spreadsheet where it was later downloaded into the software Excel and SPSS to further analyze and find structure.

3.9 Summary of Methodology

This section closes chapter three and gives a brief summary of our choices on methodology for the thesis. We have chosen to go with a quantitative approach utilizing a survey through Google Forms. The research purpose is to identify what factors are the ones influencing service quality in Kry the most. Our sample selection is based primarily on snowball sampling of people who have previously used the healthcare provider Kry. The chosen analysis process will involve the usage of a paired t-test to compare the sample's expectation of general healthcare and perception of digital healthcare provider Kry. Through the usage of Cronbach's alpha and face validity, we increase the reliability and validity of the study. Ethical consideration is highly prioritized, in the process of conducting empirical data participants are given information on the nature of the study as well as the information that they may withdraw at any moment if they experience a moment of regret.

Proceeding chapter four will go over the actual data that has been collected using these selected methods and there we will proceed with our final research.
4. Empirical Data

In this chapter, we will go through the process of which we acquired the data collection, and our thought process before, during, and after the empirical data was collected. The reader can expect to get an idea of the demographics of the sample, how the right data was accumulated through the use of a questionnaire, and other information regarding the empirical data.

4.1 Sample demographics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>Percentage of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>48.5</td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>51.5</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>20</td>
<td>60.6</td>
</tr>
<tr>
<td>25-34</td>
<td>10</td>
<td>30.3</td>
</tr>
<tr>
<td>35-44</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>45-54</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Health status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>5</td>
<td>15.2</td>
</tr>
<tr>
<td>Good</td>
<td>9</td>
<td>27.3</td>
</tr>
<tr>
<td>Very good</td>
<td>12</td>
<td>36.4</td>
</tr>
<tr>
<td>Excellent</td>
<td>7</td>
<td>21.2</td>
</tr>
</tbody>
</table>

Our participants' demographic is evenly distributed between males and females, having 16 males involved in it and 17 females. The majority of participants were between the ages of 20-24 years old, amounting to 20 individuals a total of 60.6% of the sample. The second biggest age group of those who answered the survey is between the ages 25-34 years old, amounting to 10 individuals a total of 30.3 percent of the sample. Ages between 20-34 make up 90.9 percent of the sample size, the remaining 9.1 percent of the samples consist of an adult male between the ages of 35-44 years old and two other middle-aged participants between the ages of 45-54 years old, one male the other female. According to the data, none of the participants identified their health status to be of poor quality and
the data shows that 84.9 percent rated their own health status to be good and above with the remaining 15.2 percent rating it as fair.

4.2 Dimensions

The five dimensions of the SQ are listed below, followed by chosen items from each of the dimensions. They are followed by an example taken from the questionnaire where each item was implemented into a pair of two questions based on the participant's perception of and expectation of that item in service situations. Lastly, each dimension is made into a table where each item is reviewed in pairs and their mean calculated.

**Reliability**
To be on time
Provides good service
Keeps promises
Does not commit errors
Available

**Responsiveness**
Good response time
Service time is declared accurately
Provider's willingness to help
Efficiency of service

**Empathy**
Good personal attention
Address complaints friendly
Consistently courteous
Understanding of personal requests

**Assurance**
The staff gives satisfying answers to questions
Trust in the provider to protect personal data
Confidence in provider's competence to deliver service
Good reputation

**Tangibles**
Appealing appearance
Up-to-date modernity
Easily navigated through
Well organized

**Example**

**Expectation**
On a scale of 1-5, how likely do you think it is that a healthcare provider will be on time?

O 1
O 2
O 3
O 4
O 5

**Perception**
On a scale of 1-5, how would you rate your experience with Kry's ability to be on time?

O 1
O 2
O 3
Table 2. Reliability questions

<table>
<thead>
<tr>
<th></th>
<th>Reliability Questions</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will be on time?</td>
<td>3.424242</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to be on time?</td>
<td>3.727272</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will provide good service?</td>
<td>3.515151</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to provide good service?</td>
<td>3.606060</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will keep its promise?</td>
<td>3.727272</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to keep its promise?</td>
<td>3.5625</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will not commit errors?</td>
<td>3.212121</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to not commit errors?</td>
<td>3.181818</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will be available at all hours?</td>
<td>3.181818</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to be available at all hours?</td>
<td>3.606060</td>
</tr>
</tbody>
</table>

Table 3. Responsiveness questions

<table>
<thead>
<tr>
<th></th>
<th>Responsiveness Questions</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will have good response time?</td>
<td>3.636363</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to give good response time?</td>
<td>3.242424</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will declare service time accurately?</td>
<td>3.606060</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to declare service time accurately?</td>
<td>3.606060</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think healthcare providers are to show willingness to help?</td>
<td>3.666666</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate KRY's personnel in terms of their willingness to help?</td>
<td>3.606060</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will be efficient?</td>
<td>3.484848</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to be efficient?</td>
<td>3.606060</td>
</tr>
</tbody>
</table>

Table 4. Empathy questions

<table>
<thead>
<tr>
<th></th>
<th>Empathy Questions</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectation</td>
<td>How likely do you think healthcare providers are to provide good personal attention?</td>
<td>3.636363</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to provide good personal attention?</td>
<td>3.242424</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is that a healthcare provider will address complaints friendly?</td>
<td>3.454545</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to address complaints friendly?</td>
<td>3.454545</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for healthcare providers to be courteous consistently?</td>
<td>3.363636</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to be courteous consistently?</td>
<td>3.242222</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for healthcare providers to be understanding of personal requests?</td>
<td>3.015151</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to be understanding of personal requests?</td>
<td>3.015151</td>
</tr>
</tbody>
</table>

Table 5. Assurance questions

<table>
<thead>
<tr>
<th></th>
<th>Assurance Questions</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for healthcare providers to provide satisfying answers to questions?</td>
<td>3.484848</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to provide satisfying answers to questions?</td>
<td>3.363636</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for healthcare providers to protect your personal data?</td>
<td>3.818181</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's ability to protect your personal data?</td>
<td>3.575757</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for healthcare providers to be competent enough to deliver their service?</td>
<td>3.454545</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's competence to deliver their service?</td>
<td>3.333333</td>
</tr>
<tr>
<td>Expectation</td>
<td>How likely do you think it is for a healthcare provider to have a good reputation?</td>
<td>3.333333</td>
</tr>
<tr>
<td>Perception</td>
<td>How would you rate your experience with KRY's reputation?</td>
<td>3.333333</td>
</tr>
</tbody>
</table>

Table 6. Tangibility question
We sent out the questionnaires on the 25th of May 2023 and started the analysis on the 27th of May 2023 after collecting the data from 33 participants making the sample size sufficient enough to conduct statistics (Moore et al., 2020). The empirical data we show has been taken directly from the questionnaire to Google spreadsheets where the tables have been designed. All questions work cooperatively to find both the expected service and perceived elements of the service, the points that participants rated were accumulated, and divided by the number of participants to give us their mean value for each item as presented above.

4.3 Cronbach's alpha

<table>
<thead>
<tr>
<th>Cronbach's alpha</th>
<th>Internal consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>α ≥ 0.9</td>
<td>Excellent</td>
</tr>
<tr>
<td>0.9 &gt; α ≥ 0.8</td>
<td>Good</td>
</tr>
<tr>
<td>0.8 &gt; α ≥ 0.7</td>
<td>Acceptable</td>
</tr>
<tr>
<td>0.7 &gt; α ≥ 0.6</td>
<td>Questionable</td>
</tr>
<tr>
<td>0.6 &gt; α ≥ 0.5</td>
<td>Poor</td>
</tr>
<tr>
<td>0.5 &gt; α</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

Table 7. Rule of thumb for results


The reliability dimension consisted of a total of 10 items, Cronbach's alpha for reliability was .89 indicating a good internal consistency.

The responsiveness dimension consisted of a total of 8 items, Cronbach's alpha for responsiveness was .88 indicating a good internal consistency score.

The empathy dimension consisted of a total of 8 items, Cronbach's alpha for empathy was .88 indicating a good internal consistency score.
The assurance dimension consisted of a total of 8 items, Cronbach's alpha for assurance was .78 indicating an acceptable internal consistency score.

The Tangibility dimension consisted of a total of 8 items, Cronbach's alpha for tangibility was .72 indicating an acceptable internal consistency score.

This chapter went over all the empirical data that was gathered, its authenticity, and how the data was generated. In the next chapter, chapter 5 we will start the analyzing of the empirical data through the utilization of various tools so that we can draw a conclusion from the gathered data.
5. Analysis

This chapter will go over the analytical process of the empirical data, the entirety of our relevant collected data will be presented with tables to simplify the identification of statistics. The analysis will critically analyze what has been gathered and test it using various methods so that assumptions can be made and a conclusion written.

5.1 Descriptive Statistics

**Table 8.** Descriptive statistics across SERVQUAL dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>N Statistic</th>
<th>Mean Statistic</th>
<th>Std. Deviation Statistic</th>
<th>Skewness Statistic</th>
<th>Std. Error</th>
<th>Kurtosis Statistic</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>33</td>
<td>3.481</td>
<td>0.9559</td>
<td>-0.1184</td>
<td>0.4095</td>
<td>-0.096</td>
<td>0.798</td>
</tr>
<tr>
<td>Assurance</td>
<td>33</td>
<td>3.45625</td>
<td>0.906875</td>
<td>-0.208625</td>
<td>0.409</td>
<td>0.18225</td>
<td>0.798</td>
</tr>
<tr>
<td>Empathy</td>
<td>33</td>
<td>3.432857143</td>
<td>0.951625</td>
<td>-0.497</td>
<td>0.409</td>
<td>0.293125</td>
<td>0.798</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>33</td>
<td>3.46</td>
<td>0.957875</td>
<td>-0.6195</td>
<td>0.409</td>
<td>0.668125</td>
<td>0.798</td>
</tr>
<tr>
<td>Tangibility</td>
<td>33</td>
<td>3.56375</td>
<td>0.901625</td>
<td>-0.367125</td>
<td>0.409</td>
<td>0.570375</td>
<td>0.798</td>
</tr>
</tbody>
</table>
5.2 Gap analysis

Table 9. Digital healthcare service quality and gap analysis

<table>
<thead>
<tr>
<th>Items/dimension for KRY</th>
<th>Perceived (P)</th>
<th>Expected (E)</th>
<th>Service quality P - E = Q</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S-D</td>
<td>Mean</td>
</tr>
<tr>
<td>RL1 Services are performed on time</td>
<td>3.73</td>
<td>0.911</td>
<td>3.42</td>
</tr>
<tr>
<td>RL2 Services are performed well</td>
<td>3.61</td>
<td>0.933</td>
<td>3.52</td>
</tr>
<tr>
<td>RL3 Provider keeps promises</td>
<td>3.56</td>
<td>0.982</td>
<td>3.73</td>
</tr>
<tr>
<td>RL4 Provider doesn't commit errors</td>
<td>3.18</td>
<td>1.014</td>
<td>3.21</td>
</tr>
<tr>
<td>RL5 Available all hours</td>
<td>3.67</td>
<td>1.051</td>
<td>3.18</td>
</tr>
<tr>
<td>A1 Satisfying answers to questions</td>
<td>3.36</td>
<td>1.055</td>
<td>3.48</td>
</tr>
<tr>
<td>A2 Ability to protect personal data</td>
<td>3.58</td>
<td>1.119</td>
<td>3.82</td>
</tr>
<tr>
<td>A3 Competence to deliver service</td>
<td>3.33</td>
<td>0.777</td>
<td>3.45</td>
</tr>
<tr>
<td>A4 Good reputation</td>
<td>3.33</td>
<td>0.854</td>
<td>3.3</td>
</tr>
<tr>
<td>E1 Good personal attention</td>
<td>3.24</td>
<td>1.091</td>
<td>3.64</td>
</tr>
<tr>
<td>E2 Adress complaints friendly</td>
<td>3.45</td>
<td>0.971</td>
<td>3.55</td>
</tr>
<tr>
<td>E3 Polite consistently</td>
<td>3.27</td>
<td>0.719</td>
<td>3.36</td>
</tr>
<tr>
<td>E4 Understanding of requests</td>
<td>3.61</td>
<td>1.059</td>
<td>3.52</td>
</tr>
<tr>
<td>R1 Good response time</td>
<td>3.64</td>
<td>0.859</td>
<td>3</td>
</tr>
<tr>
<td>R2 Declare service time accurately</td>
<td>3.61</td>
<td>0.899</td>
<td>3.24</td>
</tr>
<tr>
<td>R3 Willingness to help</td>
<td>3.61</td>
<td>0.899</td>
<td>3.67</td>
</tr>
<tr>
<td>R4 Efficiency of service</td>
<td>3.61</td>
<td>1.029</td>
<td>3.48</td>
</tr>
<tr>
<td>T1 Appearance</td>
<td>3.58</td>
<td>0.807</td>
<td>3.27</td>
</tr>
<tr>
<td>T2 Up to date technology</td>
<td>3.75</td>
<td>1.138</td>
<td>3.48</td>
</tr>
<tr>
<td>T3 Easily navigated through</td>
<td>3.73</td>
<td>1.039</td>
<td>3.39</td>
</tr>
<tr>
<td>T4 Well organized</td>
<td>3.67</td>
<td>0.89</td>
<td>3.64</td>
</tr>
<tr>
<td>Reliability (mean of RLs)</td>
<td>3.55</td>
<td>0.986</td>
<td>3.48</td>
</tr>
<tr>
<td>Assurance (mean of As)</td>
<td>3.4</td>
<td>0.956</td>
<td>3.575</td>
</tr>
<tr>
<td>Empathy (mean of Es)</td>
<td>3.4</td>
<td>0.971</td>
<td>3.6</td>
</tr>
<tr>
<td>Responsiveness (mean of Rs)</td>
<td>3.62</td>
<td>0.913</td>
<td>3.4</td>
</tr>
<tr>
<td>Tangibles (mean of Ts)</td>
<td>3.68</td>
<td>0.986</td>
<td>3.42</td>
</tr>
</tbody>
</table>

Note: Listed SQ scale consists of five dimensions and the mean of all their respective items.

In chapter 2.2 we went through the application of the SQ model. The data can be interpreted by using the SQ equation, which measures the quality of a service using the equation \( Q = P - E \). This means we calculate the mean of the perceived service, then subtract that number from the mean of expectation. If the number turns out to be less than zero we identify an inferior service as the service failed to meet the expectations of the consumer. The service is considered superior if the value is above zero, meaning the perceived experience was greater than their expectation (Grapentine, T.1999).

**Perceived (P)**
Each dimension has its perceived and expected value, subtracted by each other to study the gap that measures the quality of delivering health care digitally. When analyzing the perceived experience of the service, we notice that tangibles had the highest mean, followed by responsiveness. Empathy had
the lowest perceived service quality. This means patients were the least satisfied with the empathy dimension which includes personal attention, addressing complaints, understanding of requests, and overall politeness. We can relate this back to our problem discussion where a study was presented. Participants that took part in the study expressed emotions like feeling neglected and unheard, which describes the continuing issue of empathy in a digital environment.

**Expected (E)**

Looking at the expectations of the service, we can clarify that assurance had the highest mean while responsiveness had the lowest. The expectations were low in the dimension of responsiveness which covers questions about the response time, willingness to help, and efficiency of the service. Consumers had the least expectations for question R2 about the service having a good response time. We thought it was logical as technology has a tendency to encounter difficulties that might or might not slow down the response time.

However, the results indicate that the consumer had high expectations when it came to the assurance quality of Kry. Question A2, the ability to protect personal data received the highest mean when it comes to the expectations of the service. This came as a surprise to us, as recent research has shown signs of concern when it comes to the security of the patient's medical data and personal information (Watson, 2020).

**Quality (Q)**

As mentioned, we used the formula P-E to calculate if the quality of the service is superior or inferior. As long as the number is positive, the experience was greater than the expectations. In this case, we found an overall positive correlation between the different dimensions and the service quality in Kry. The quality of the service is above average as the mean of both the perceived and expected service is above 3. The quality was the highest in the tangibility dimension and lowest in assurance. Question R2 regarding the provider's response time demonstrated a surprisingly high quality of service. This could either be that the expectations appeared to be low in this sector, or the response rate was perceived as high amongst the consumers. However, analyzing our data in this way made us recognize the weight of the ongoing pressure of empathy in these settings. In the dimension of empathy, specifically referring to question E2 about good personal attention we identify an inferior service quality in Kry. Along with other healthcare providers, Kry seems to also encounter difficulties in adapting a more personal feeling to their platform.
5.3 Paired T-Test

A paired t-test is a test that is utilized to find out if the difference between two means is actually zero meaning that the difference is something derived from chance and not a true statistical difference (Statistics Solutions, 2022).

H0 = There is no difference between the service quality of ordinary healthcare and of the digital healthcare provider Kry

H1 = There is a difference between the Service quality of ordinary healthcare and of the digital healthcare provider Kry

Table 10. Paired t-test

<table>
<thead>
<tr>
<th></th>
<th>Perception Mean</th>
<th>Expectation Mean</th>
<th>Difference</th>
<th>SDd</th>
<th>T-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability (mean of RLs)</td>
<td>3.55</td>
<td>3.48</td>
<td>0.07</td>
<td>0.264</td>
<td>0.046</td>
<td>0.31</td>
</tr>
<tr>
<td>Assurance (mean of As)</td>
<td>3.4</td>
<td>3.575</td>
<td>-0.175</td>
<td>0.111</td>
<td>-0.274</td>
<td>0.13</td>
</tr>
<tr>
<td>Empathy (mean of Es)</td>
<td>3.4</td>
<td>3.6</td>
<td>-0.2</td>
<td>0.203</td>
<td>-0.171</td>
<td>0.31</td>
</tr>
<tr>
<td>Responsiveness (mean of Rs)</td>
<td>3.62</td>
<td>3.4</td>
<td>0.22</td>
<td>0.303</td>
<td>0.126</td>
<td>0.17</td>
</tr>
<tr>
<td>Tangibles (mean of Ts)</td>
<td>3.68</td>
<td>3.42</td>
<td>0.26</td>
<td>0.141</td>
<td>0.321</td>
<td>0.04</td>
</tr>
</tbody>
</table>

The p-value was also calculated and every single dimension except for tangibles (P = 0.044) showed a P value larger than alpha (0.05). The p-value represents how likely or unlikely our empirical data is, under the assumption that the null hypothesis is true (Nahm, 2017).

A small p-value meaning a value lower than that of the chosen significance level otherwise known as alpha and for this case 0.05 indicates that it is rather unlikely for the data to have happened by chance meaning that it strongly disagrees with the null hypothesis and supports the alternative hypothesis. If the value however is larger than the alpha the opposite is true, the likelihood of the empirical data being a result is quite big leading to us not being able to reject it. A large p-value however does not prove the null hypothesis to be correct, it only means that we need more testing. Nevertheless reliability, assurance, empathy, and responsiveness all failed to reject the null hypothesis of there being no difference between the service quality of ordinary healthcare and of the digital healthcare provider KRY. Tangibles however provide a p-value that rejects the null hypothesis.

Once we had the t-value calculated for each dimension we noticed that the t-value was smaller than the critical value (2.021) indicating that the t-value was within the range of what was expected under
the null hypotheses which means the difference is not statistically significant meaning the null hypothesis still cant be rejected (Moore et al., 2020).

5.4 Confidence interval

The confidence interval is an estimate of where the true value is within the null hypothesis, If the confidence interval does not include the value 0 it shows no possibility for the null hypothesis to be true as the chance for no difference is removed (Moore et al., 2020). Therefore the alternative hypothesis is to be supported. If the confidence interval does include 0 and the t-value is outside the confidence interval it indicates that the t-value is not what would be expected for the null hypothesis and therefore serves as further evidence against the null hypothesis.

<table>
<thead>
<tr>
<th>CONFIDENCE INTERVALS</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reliability</strong></td>
<td>-0.023</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Assurance</strong></td>
<td>-0.274</td>
<td>-0.213</td>
</tr>
<tr>
<td><strong>Empathy</strong></td>
<td>-0.271</td>
<td>-0.171</td>
</tr>
<tr>
<td><strong>Responsive</strong></td>
<td>0.113</td>
<td>0.126</td>
</tr>
<tr>
<td><strong>Tangibles</strong></td>
<td>0.211</td>
<td>0.308</td>
</tr>
</tbody>
</table>

We are 95% sure that the true mean difference in reliability is between -0.023 and 0.163. The null value of 0 is inside the confidence interval and the t-value is within that interval therefore the null hypothesis cannot be rejected for the reliability dimension.
The rest of the dimensions' confidence interval lack the possibility for 0 which provides them with evidence against the null hypothesis and can therefore be rejected and the alternative hypothesis can be supported.

Summary
The gap analysis provided us with the information that overall the service quality in KRY showed to be good with tangibility showing the biggest positive difference in the evaluation indicating it to be the highest quality dimension and the superior element of the service. It was followed by responsiveness which also showed superior service and thirdly reliability whilst showing a lot less difference than the previous two but still maintained a positive difference of 0.07 making it too a superior service dimension. The remaining dimensions of assurance and empathy however showed to be inferior in the healthcare provider KRY. Empathy scored the lowest on quality and assurance not far behind it. The paired T-test showed us values smaller than the critical value which indicated that the difference between expectation and perception was not statistically significant for the significant value we had chosen and therefore the null hypothesis could not be rejected. The confidence interval however showed evidence against the null hypothesis for every dimension except for reliability which had its t-value inside an interval that included the possibility of 0.

Now to understand this, even though the t value does not show statistical significance due to it being smaller than its critical value we can still see evidence of there being a difference in the confidence interval for the most part (excluding the reliability dimension) due to the interval not having 0 within itself. A confidence interval shows the researcher an interval where the true value lies. If the confidence level doesn't have 0 within itself it indicates that there is indeed a difference which in this case shows to be the case for all the dimensions except for reliability.
6. Conclusion

This chapter is the last part of our thesis in which we will be making a conclusion by presenting in a clearer manner the main finding of the study and answering our research question (George, 2022).

6.1 Discussion

Kry is doing very well. They've set a series of deliverables which are all meeting their clients' expectations well. We expected there to be quite a big difference in the empathy dimension due to our own perception of the industry, seeing it as a more intimate relationship between the provider and consumer. Articles such as the study made by Gordon et al. (2020) declared that some patients felt that doctors were less attentive to them when they were receiving digital healthcare and that the overall encounter was less personal due to what they believe may be caused by the screen separating them. That however turned out not to be the case as empathy showed no significant difference in the service quality evaluation.

We also assumed that there would be quite a gap in the assurance dimension as studies (Gordon et al., 2020) showed patients to be concerned regarding the accuracy of a diagnosis due to the doctors being limited in examining the patient and only resorting to using his or her eyes and the level of verbal communication from the patient explaining their symptoms. Assurance showed to have no significant difference either. The only significant difference in Kry compared to traditional healthcare was the tangibility dimensions where patient perception exceeded patient expectations. This means the appearance of the website, the technology, the navigation process, and it's well-organized showed to be a satisfying online experience. Because there is no significant difference in the dimensions apart from tangibility which exceeds that of traditional healthcare, we can tell that telemedicine is performing well in the delivery of its service.

6.2 Theoretical contribution

Now we have further increased the amount of data within the service quality in digital healthcare but also helped contribute to filling out the gap in knowledge of knowing which part of the telemedicine service is lacking and which part is thriving. We have now confirmed there to be no significant difference in the dimensions apart from tangibility which hopefully can serve as support for future research and the older research within the area of research. This study may also work as an example
where the SQ model has been utilized as a primary measurement of evaluating service quality showing that it still is a relevant measurement in 2023.

6.3 Practical contribution

Now businesses in the healthcare industry can use this to understand what healthcare providers should be doing when branching out to digital services. This study can serve as an example of how there isn't much difference between what people expect and what people receive in telemedicine and can hold the healthcare provider Kry as a role model of what to do when providing digital healthcare.

6.4 Limitation

The limitations of our research are mainly the small and biased sample. Given the amount of time that we had to get empirical data, we succumbed to the urge of doing snowball sampling starting off with the close circle of friends in the university which led to our sample data consisting mostly of those aged between 20 to 24 years of age. The small sample of 33 also made the analysis afterward more difficult as the sample was statistically enough to draw conclusions for the population but not optimal for the analysis.

6.5 Suggestions for further research

Utilizing the SQ model was very useful for measuring the service quality of Kry, and is highly recommended for future research. Draw a more randomized sample as our sample mainly consisted of people aged 20-24 which leaves the results to be less accurate of an estimation of the overall population. A larger sample size would also be a piece of advice for future researchers as the statistical data would be more reliable and the results closer to the reality of the population.
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