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NATIONAL REALITY AND FUTURE DETERMINANTS OF TELEMEDICINE USE

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Master in Corporate Management

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BUSINESS
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Department of Human Resources and Organisational Behaviour

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Resumo

Inicialmente descrita em 1970, a telemedicina é vista como uma forma de receber cuidados de saúde à distância. A pandemia do COVID-19 criou a necessidade de implementação de serviços de telemedicina, a fim de proporcionar opções de cuidados de saúde mais seguras. A perceção e a satisfação com a telemedicina são fatores ligados à utilização destes sistemas, e a compreensão da atual perspetiva sobre a telemedicina por parte da população, pode garantir a sua satisfação agora, e no futuro.

Num primeiro estudo, ao investigar a atual implementação da telemedicina em Portugal, através de entrevistas informais, os resultados mostraram que atualmente enfrentamos muitos obstáculos na transmissão de informação e formação da telemedicina, levando a um uso inadequado e baixa satisfação com os sistemas. Através do nosso segundo estudo, avaliamos estatisticamente possíveis fatores que afetem a relação entre estas duas variáveis, tais como a qualidade da interface tecnológica e interação, a confiança no sistema, e a autoeficácia na utilização destas tecnologias. Este estudo criou uma estrutura de correlação básica para fatores baseados na perceção que impactam a satisfação, tornando-o um guia valioso a considerar ao construir ou criar ferramentas para garantir a aceitação e utilização futura deste serviço.

***Palavras-chave*:** telemedicina, Portugal, perceção, satisfação.

Classificação JEL: I190; Y40

Abstract

Firstly described in 1970, telemedicine is perceived as a way to receive care of health in distance. The COVID-19 pandemic has created the need for implementation of telemedicine services in order to provide safer healthcare options. Perception and satisfaction with telemedicine are linked factors to the use of these systems and understanding a population's current perspective of telemedicine can ensure their satisfaction now, and in the future.

In our primary study, by investigating current telemedicine implementation in Portugal through informal interviews, results have shown that we currently face many obstacles in education and training of telemedicine, leading to poor use and satisfaction with the systems. Through our second study, we statistically assess possible affecting factors to the relationship between these two variables, such as the quality of the interface and interaction, trust in the system, and self-efficacy in using these technologies. This study has created a basic correlation structure for perception-based factors impacting satisfaction, making it a valuable asset to consider when building or creating tools for ensuring acceptance and future use of this service.

Keywords: telemedicine, Portugal, perception, satisfaction.

JEL Classification: I190; Y40

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Introduction

The implementation of communication and information technologies in healthcare organizations can be affected by many different aspects. Telemedicine can be explained as the use of current video and phone technology to communicate and diagnose patients remotely (Willemain and Mark, 1971). The arise of the COVID-19 Pandemic has brought up the context of telemedicine, using it as a tool of great power in safely and quickly diagnosing and monitoring patients over time. Even though these practices were adopted with bigger vigour at this period, they remain great tools in a daily basis, being a pertinent subject of study.

With this dissertation there is an attempt to explore, describe and contextualize the current and future use of telemedicine in Portuguese health institutions, along with the perception of both medical professionals and patients. To carry out this study, an exploratory and contextual research design was chosen, to be created in two complementary studies, qualitative and quantitative, forming a mixed method methodology, as defended by Burns, Grove, and Gray (2014), and Polit and Belick (2004).

For the first qualitative study, we seek to characterize telemedicine in Portuguese context, from the personal perspective of medical staff. Through all these different dimensions to analyse, human-related factors exist in the way of how clinicians and patients perceive these technologies, affecting the success of their implementation. It is also crucial to understand how to better the concept of remote access of care in all its possibilities, and by understanding the view of those who use it shows to be a tool of great potential in improving Portugal's Healthcare approach to health in the future, in which there is little to no knowledge of. The second study will test a possible connection between the identified dimensions presented in the first study, as described in the literature review, and understand which ones are determinant to the future of telemedicine.

The thesis is distributed into different sections: firstly, a thematic framing chapter, followed by two complementary studies, each we proposed with a paper-like organization (consisting of objectives, methodology, results, and discussion), finishing with a global analysis presenting the conclusions for our dissertation. We expect our results to serve as a basis for future studies through our mixed methodology and gathered data, as well as serve as a guide of factors to consider in telemedicine implementation, both in a business level (infrastructures and importance of interface) and societal level (factors affecting satisfaction and acceptance).

CHAPTER 1

Thematic Framing

After careful consideration on Portugal's healthcare systems, it was noted that whilst being a topic of high perceived value, telemedicine is not a topic heavily discussed (Matos et al., 2014). With the arise of the necessity for monitoring and administering care of health in distance, the topic of telemedicine is perceived by many (e.g., Bird in 1971 to Indria, Alajlani and Fraser in 2020) as a new way of administering care of health, when it has been a topic existent in Portugal discussed for over two decades (Castela et al., 2005). As the world of technology evolves, so does the way it performs in medical delivery. The implementation of daily practices for telemedicine seems like a promising plan to manage chronic patients and enable monitorization of patients when no physical examination is required (Lin et al., 2017). However, little is known about the impact of this practice in the context of the Portuguese society, and how it is perceived by both Portuguese patients and medical staff in the central Lisbon area. With the evolution of technology, the concept of telemedicine has been redefined accordingly to these advances (Matos et al.,2014).

Telemedicine is a practice that has been around for some time now. The evolution of communication and information technology has allowed this system to be feasible, reliable, and effective. As so, it's a current topic with much relevance and with a big potential to be developed for future studies in the Portuguese context, allowing for a better understanding of telemedicine in Portuguese healthcare facilities, its current benefits and obstacles, the efficacy in which they are performed, and which models work best for both patients and clinicians.

As so, we intend with the information gathered from this dissertation, to understand the perception and usage of telemedicine in Portugal, alongside with their satisfaction with the current implemented models. With that information, we will parallelly relate on the existence of a correlation between perception and satisfaction, allowing for the construction of better models in the future.

1. Main Concepts

1.1. Health

The World Health Organization (WHO) describes health in their constitution as "A state of complete physical, mental and social well-being and not merely the absence of disease or

infirmity" (Constitution of the World Health Organization, 1948, p.1). Zsuzsanna Jakab, WHO regional director for Europe in 2011, when discussing the road to better health and well-being in Europe, addressed other speakers for their considerations on the matter. She did so by asking them to wonder if, in the face of economic uncertainties, they were successfully building health platforms, financing the right technologies for our needs, and involving the correct means to satisfy those needs (World Health Organization, 2019). Those consideration remain accurate in the present days, and with the constant advance of technology and lifestyle bringing on new needs in the healthcare sector, this literature is a mandatory piece for the development of this theme.

1.2. Telemedicine

Telemedicine is concept that has resurfaced amidst the COVID-19 pandemic. However, its first formal addressing has been made by Bird in 1971, defining telemedicine as a form of care in the form of interactive audio and video between patient and physician. Nonetheless, this definition became more inclusive as it was later propositioned by Willemain and Mark (1971) as any type of system in which doctor and patient subsisted in different locations. Telemedicine was then associated with a much larger concept rather than just care at distance.

In the last half of the decade, Bashshur, Reardon and Shannon (2000) included different parameters to this concept: the use of informatic resources as an alternative to face-to-face interaction, the geographical gap between doctor and patient, new regulatory measurements for the safety of information and quality of care, inclusion of staff for these tasks, the establishment of protocols and platforms to perform telemedicine and an organizational structure that could uphold these needs. As so, telemedicine suffered a variation regarding the different parameters it upheld over time.

2. The Portuguese Context

From the national reality context of telemedicine perception and use, we could originate our research questions for our first study.

Castela et al. (2005) relate that the first reported experiences of telehealth in Portugal appear in 1998, in the Central region, along with the reporting teleconsultations in Paediatric Cardiology and in Alentejo, with a telemedicine network between primary health care and hospitals by the National centre of telehealth (CNTS, 2014). Matos et al. (2014), cover in the book "Telemedicine: where are we?" the recognition of the importance of telehealth as an axis

of the strategy to promote access and equity in health in Portugal has been realized through government initiatives dedicated to its development. Since 2001, four working groups have been created for the study and implementation of telemedicine. In 2001, the first Health Ministry dispatch was created (nº 24142/2001 November 1st from the Assistant Secretary of State to the Minister of Health) for the study of telemedicine, including eight vital suggestions for the future of telemedicine. In 2003, teleconsultations were working in full in Hospitals and Health Centers in Alentejo, which gave access to the creation of the TeleMedAlentejo the following year, to allow telediagnosis in the full Alentejo area. In 2005 the second work group (from the General Health directory) was created with a few more recommendations for the study of telemedicine in Portugal. In 2007, there were 5 telemedicine platforms implemented in the central area, from the regions of Guarda to Leiria, covering over 50 health units. Later that same year, the third dispatch (nº6538/2007 from the Deputy Secretary of State for the Minister of Health) was created for the development of telemedicine on the National Health Service (from the Assistant Secretary of State of the Minister of Health). In 2012, the fourth and final dispatch (nº 742/2012, the 2nd of July 2012) was created for the operationalization of telemedicine in the ambit of commission for clinical informatisation (Capitão, Leite and Rocha, 2008).

In the study conducted by Capitão, Leite and Rocha (2008), about the analysis of the Portuguese situation regarding telemedicine, a questionnaire was made to the main institutions in the National Health Service and Portugal Regional Health Administrations, it was noted that even back then, most of the hospitals had some sort of telemedicine practice and all respondents shared the belief that it increased the quality and access to hospital resources. From all hospital's interviews, it was also noted that even in hospitals with no telemedicine practices there was a will to implement the method far ahead, as they saw "the advantages" in it.

It was in 2016 when these groups created the National Plan for telemedicine (SPMS) by elaborating a regulatory board for telemedicine and the definition of health priorities in Portugal. Focusing on Portugal's situation and adoption of telemedicine, the Portuguese Association of Hospital Administrators (APAH) announced in June 2020, the launch of the Health Technology Acceleration Program, which aims to foster the use of telemedicine in the National Health Service (SNS). This aims to encourage health professionals to use technology and digital platforms to facilitate doctor-patient communication. In the statement, the president of APAH, Alexandre Lourenço, said that "the pandemic imposed the immediate use of these resources and, therefore, it is urgent to equip all stakeholders with the necessary tools so that they can be used efficiently and effectively. Best practices have to be shared, so that the added

value is clear to everyone" (Jornal Médico, 2020, p.7). Given the current situation, the use of telemedicine has been establishing itself as the new normal in Portugal. According to the monitoring carried out by the SNS, from January to May of 2020, around 16 thousand consultations have already been carried out by this service. This number corresponds to more than half of the total number of consultations recorded in 2019 (Serviço Nacional de Saúde, 2021), which shows a relatively fast adaptation, not only by health professionals but also by patients.

As previously explained in this literature review, the concepts telehealth and telemedicine described by Bashshur, Reardon and Shannon (2000), seem to have similar qualities but are differently described, as the introduction of new technology with time is infinitely adding up to the definition of telemedicine, this leads us to the research question (RQ) first study (S01) - S01RQ1: *"What is the overall perception of "Telemedicine"* in *Portugal?"*.

These authors also referred challenges in adherence to telemedicine, with lack of warmth and personal closeness brought up by this system being one of them. As so, it seems important to investigate the view on the applications and challenges with telemedicine in Portugal, towards a better understanding of what are applications that are considered essential and inacceptable for adhesion. This need leads to the creation of our research questions S01RQ2: "What are the reasons for adherence?" and S01RQ3: "What are the reasons for resistance?".

Other aspects to be considered are also in matters of infrastructure and access to technological supplies, which differ across countries, described by Indria, Alajlani and Fraser (2020). As for the mentioned complaints and improvements, it becomes clear that it is necessary to understand what the opinion of Portuguese users of telemedicine is. As this dissertation is focused on the point of view of clinicians and patients on the available resources, this point will be explored in depth, as research question S01RQ4: "Are the existing Models in Portugal considered to be of quality?".

Concerning clinicians' satisfaction with the system, no formal models exist, however previous studies (e.g., Ayatollahi, Sarabi and Langarizadeh (2015) and Albarrak et al., (2021)) still assessed their level of satisfaction with the performance of telemedicine is by using directed questionnaires. This research brings out the concern of user's satisfaction with telemedicine, creating the research question S01RQ5*: "What can be done to increase satisfaction levels with telemedicine?"*.

Moreover, to understand the basis behind user's opinions is vital to tailor these tools to their needs and develop programs that will be effective, long lasting, and easy to adhere, which

creates a solid research basis for our study on the Portuguese population, which would lead to the research question S01RQ6: *"What is the current use of telemedicine in Portugal?"*
As the characterization of Portugal's telemedicine status is not well known, it is vital to understand what the current potential of investing in telemedicine would be, leading to the final research question S01RQ7: "*Is there potential in investing in telemedicine for the future?",*

3. Challenges and Future Determinants

This topic represents all literature relative to our second study.

3.1. Telemedicine vs Telehealth

As telemedicine in the 1970th decade had medical care as the sole motif for telemedicine, there was a necessity to expand this topic as done by Bennet et al. in 1979 with the term "Telehealth". As so, telehealth was defined as a supporting system of telemedicine, as a resource for more effective exchange of information. It was also suggested that telehealth should include all the care of health, geographical distance, patient, and doctor education. According to Bashshur, Reardon and Shannon (2000), both telehealth and telemedicine both include physical separation and the use of actors in telecommunication to "enable, facilitate, and possibly enhance clinical care and the storage, gathering and dissemination of health-related information" (Bashshur, Reardon and Shannon, 2000, p.614).

These authors also conceptualize the concept of telemedicine in the modern context in a rather informative way. When mentioning the evolution of telemedicine, it is important to understand all the different fields in which this innovative practice is represented. Not only on a social level, but also in a technological and organizational plane. These authors reflect on how communication and technology create a big dimension in telemedicine, though with the condition that these means require them to be able to mimic the effect of a traditional setting. Said this, it is emphasised that the quality of information must be equally complete and of quality when compared to a in vivo consultation.

World Health Organization defines telehealth as "The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies, for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research, and evaluation, and for the continuing education of health care providers, in all the interests of advancing the health of individuals and their communities" (World Health Organization, 2010, p.93). Following this description, in this

dissertation, the two terms, telemedicine and telehealth, will not be distinguished, as we will be using "telemedicine" to report both telehealth and telemedicine. Also, In the scope of this investigation, we will be referring to telemedicine solely in the context of the provision of medical care at distance, and education of health professionals along with its influence on clinical care.

3.2. Applications and challenges

Lockamy and Smith in their 2009's article on telemedicine, have defined applications and challenges through literature research and field research in four different healthcare organisations. As so, there were several important applications ascribed, such as teleconsultations by video or phone calls and teleradiology, which can be described as the act of sending either X-rays, Magnetic Resonance Images (MRI) or computerized tomography scans (CT), which was until recently, the biggest use telemedicine had. In regards of information, the transmission of medical information such as patients' medical records, billings, schedules or even insurance claims have proven to reduce costs for both hospitals and travelling patients, eliminate long trips for short doctor's appointments, increase access to healthcare and make response time quicker as people have instant access to information. Another dimension referred in this study was the tele-education sector, as any training sessions can be done remotely, as professionals who work long shifts can watch and learn more easily. Challenges in telemedicine are reported in this piece as matters of legal problems with licenses and liabilities, lack/poor use of financial resources and quality of care: in the learning, implementing, and accepting telemedicine practices.

As per Bashshur, Reardon and Shannon's review in 2000, another aspect that was considered was the lack of warmth and closeness that telemedicine provokes, which is a factor that contributes to the complexity around building acceptance of telemedicine as a daily practice. It is also denoted that whilst there is struggle in accepting telemedicine, it is known that with the progress of technology, this type of resource finds itself more and more integrated in healthcare, whether it's in its management, education, or administration, being indispensable nowadays. When it comes to the social and human level, these authors made it clear that the physician-patient relationship is altered. The former described essence of the personal encounter between physician and patient was now a remote connection with no physical contact, along with the inexistence of other helping medical staff, which we usually encounter in a hospital.

In a study made in Indonesia, with the aim to investigate clinicians' perceptions, Indria, Alajlani and Fraser (2020) use a simple questionnaire asking a total of 100 clinicians about their opinion on telemedicine. In the results of this study, we could understand that around 80% of the clinicians were very satisfied with the telemedicine system and reported that it was useful for speedier diagnosis and treatment. When asking for five specific uses that clinicians liked the most on telemedicine, faster diagnosis, a reduced number of referrals, an increase in patients trust, bigger skills/coordination, and easiness to use were highlighted. As so, it is important to assess the impact of system usefulness in satisfaction and acceptance of telemedicine, with hypotheses S02H1: "*System Usefulness will have a positive effect in Satisfaction"* and S02H2: *"System Usefulness will have a positive effect in Acceptance".*

Nonetheless, close to 50% of those interviewed said that poor internet connectivity was a big obstacle and referred to poor technical quality, the increase of workloads and working time, along with limited funding as further concerns. This article informs us that the existence of obstacles in this area does not refrain the thought that telemedicine is useful. As for suggested improvements, better internet connection and electricity, better service quality (in this case stated as quick delivery of results) and periodic training to keep up to date with the development of technology were mentioned. As so, we can speculate that more effective technology and regular training would lead bigger self-efficacy[1], and consequently improved levels of acceptance and satisfaction with the electronic interface. To test to this theory, statistical hypotheses S02H3: *"Self-efficacy has a positive effect in the intensity of the relationship between Quality of interface and Acceptance"* and S02H4: *"Self-efficacy has a positive effect in the intensity of the relationship between Quality of interface and Satisfaction"* were created.

3.3. Telemedicine as seen by clinicians and patients

Even though there is still little to no information of patients or clinicians' points of view in Portugal, there were some patterns noted across studies on the views of clinicians and patients on the matter, allowing for the identification of trends along different clinicians and patients from different countries, along with their view on resistance and acceptance of telemedicine.

A study made in 2021, in Saudi Arabia, by Albarrak et al., was made using questionnaires to different health organizations toward understanding the perception and willingness of telemedicine on the area. The results showed that almost half of the participants had low knowledge about telemedicine technology among various specialties, and it also showed that

[1] Self-efficacy is referred in this dissertation as regarding telemedicine practices.

50% of them are not familiar with the tools and their medical applications and technology. However, even with the lack of perception, 90% of the participants see telemedicine is a viable approach for medical care services and think that information and communication technology play a potential health a potential role in healthcare. This reflection goes in agreement with the previous research in Portugal about the perception of the importance of telemedicine even if it's not implemented in all hospitals. Most of the participants agreed that they would be willing to implement telemedicine and further would like to watch a procedure as it's taking place.

On the other end of the spectre, a study published on in 2015 by Ayatollahi, Sarabi and Langarizadeh, showed that when aiming to understand knowledge and perception of telemedicine, using cross sectional studies, the results showed that the clinicians had little knowledge about telemedicine, advantages were known on a modest level and disadvantages in a low level. As a result, it was revealed that less knowledge about the subject leads to less positive results on their willingness to use telemedicine. Moreover, even with their limited knowledge on the matter, Ayatollahi, Sarabi and Langarizadeh (2015) refers that even with limited knowledge from the clinicians on telemedicine, that most thought that the use of this technology is necessary, which goes in agreement with other studies reporting the knowledge on the necessity of telemedicine (e.g., Indria, Alajlani and Fraser (2020)). These articles bring out the thought that better perception of the telemedicine interface could potentially impact willingness to use it. Perception on the matter may come for bigger familiarity with the telemedicine Interface, increasing easiness of use and therefore increasing the perception of system usefulness. The close relationship between these variables creates the need for the investigation hypothesis S02H5: "*Easiness of use is correlated with System Usefulness"*.

Literature has also shown that in most cases, most of the same factors influence acceptance and resistance, according to the way they are implemented. Zanaboni and Wootton (2021) studied the predictive factors of telemedicine acceptance and behavioural intention using a simple survey, to better understand the reason behind the existing resistance to telemedicine, regardless of the development of its technology. The results further confirmed the theory that the perception of telemedicine impacted the use of the technology. Accessibility of medical files, the efficacy of the system and the use of perceived system usefulness as a regulatory factor were found to have a positive impact in the quality, acceptance, and use of telemedicine. Based on these facts, we can articulate the statistical hypotheses S02H6: *"System Usefulness will have a positive effect in Quality of care"*.

They have further stated that advantages for users, such as accessibility and incentives are vital when designing a successful telemedicine system. On the other hand, if systems

implemented are hard to understand and navigate, that will certainly influence clinicians and patient's decision regarding its use. In Spain, Saigí-Rubió, Torrent-Sellens and Jiménez-Zarco conducted in 2014 surveys in three countries, revealing that in the three samples, the physician's level of knowledge and use of information technology was the variable with the largest clarifying power regarding the use of telemedicine, further confirming the hypothesis. This leads to the thought that the perception of easy and useful interfaces influences people's willingness to use the system, and use it better, creating the statistical hypotheses S02H7: *"System Usefulness will have a positive effect in the Quality of the interface"* and S02H8: *"Easiness of use will have a positive effect in the Quality of the interface"*

Lin et al., in 2017 performing meta-analysis has shown that the use of telemedicine interventions, with home-based tele transmission was very effective in reducing all-cause mortality and heart-failure related hospital admissions in 39 eligible studies. Moreover, Cottrell et al., in 2018, used surveys to monitor the progress of a home-based telemedicine system in the monitoring of chronic spinal pain. In this study, it was noted that clinicians and patients were both very satisfied and more accepting and trusting with the telerehabilitation over time, working with a time-saving and profitable platform. Cottrell also affirmed that comprehending clinicians' perspectives is decisive during the early implementation stages to provide lasting sustainability.

Regarding general benefits, Villines (2020) has listed several advantages for both patients and healthcare workers such as: Lower costs for both hospitals and patients, convenience, safety against hospital-acquired illness and easier access to preventive care. The author also lists concerns such as the need for the right type of technology and the use of effective communication as there is no physical examination, making the communication of all symptoms vital. As so, for staff to provide care without examination, we question if the level of trust the staff has in the system usefulness of the system may affect the quality of care provided. Accordingly, this thought precedes the formulation of hypothesis S02H9: *"Trust has a positive effect in the intensity of the relationship between System Usefulness and Quality of care".*

Indria, Ajlani and Fraser (2020) in their article also refer the reduced travel costs and equality of care throughout the whole population. Concluding, the monitoring and diagnosing methods provided by telemedicine show overall satisfaction on both parts, showing potential for further development and more regular use. This leads to believe that users are aware of the benefits of telemedicine and when well implemented, work smoothly, directing us to hypothesis

S02H10: *"Quality of electronic systems will have a positive effect in Acceptance" and S02H11: "Quality of electronic systems will have positive effect in Satisfaction".*

3.4. Satisfaction with Telemedicine

As telemedicine is a modality in the conveyance of healthcare, it should be evaluated the same way as any other traditional healthcare unit would. However, without the physical dimension involved in telemedicine, the measurement of satisfaction relies heavily on patient reports, and their opinion on the matter can either make the system a more logistic-friendly and safe method or turn it into a wasted investment. As the pandemic brought out the huge necessity of the implementation of telemedicine practices, maintaining good customer satisfaction (from both users and receivers of healthcare) and creating an environment where patients feel as safe and comfortable as they would in a physical consultation becomes irreprehensible. Keeping up with user demands as technology evolves, creates better platforms for service and efficiency in diagnosis, treatment, and monitoring (Kruse et al., 2017).

To analyse satisfaction with telemedicine, we need to understand what parameters to use in assessing satisfaction. Mao, Gigliotti and Dupre (2020) explain that in the past, quality of management has been measured by patient satisfaction, using as most common methods the Press Ganey Medical Practice Survey and the Hospital Consumer Assessment of Healthcare Services (H-CAHPS). Questions in these surveys assess parameters such as the clarity and quality of sound in communication, effective listening, and courtesy and respect in which patients were treated, which serves as a solid base for the enquiry of Portuguese patients on their satisfaction with teleconsultations. With this information, we can contemplate on the existence of a relationship between good quality of service leading to bigger satisfaction, forming hypotheses S02H12: *"Quality of interaction will have a positive effect in Satisfaction".*

So far, all the literature reviewed studies point in the direction that telemedicine is seen as an important tool in Portugal's healthcare, and that with the implementations of the above-mentioned pioneer programs, it has become easier and easier to access technological resources without major costs in upkeep and implementation. With this realization, we can assess if easier to use tools in telemedicine affect the satisfaction and acceptance of users in Portugal, by assessing statistical hypotheses S02H13: "*Easiness of Use will have a positive effect in Satisfaction*" and S02H14: *"Easiness of Use will have a positive effect in Acceptance"*

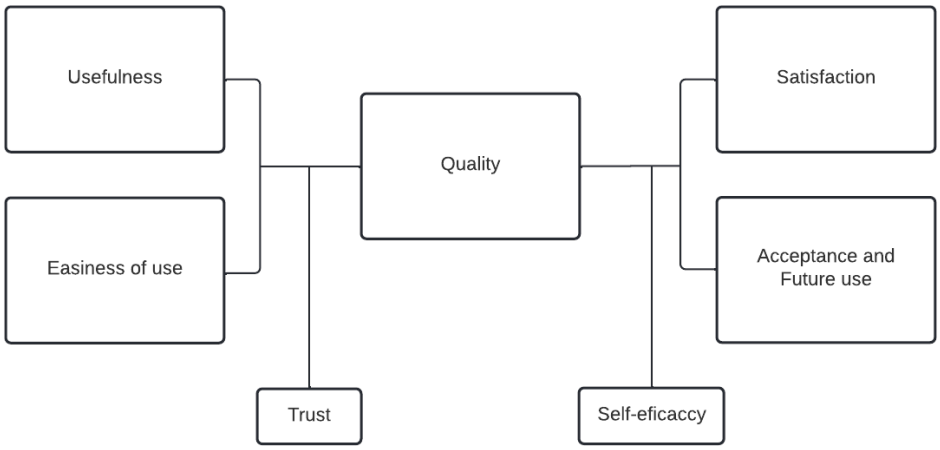
Lockamy and Smith (2009) denote that it is crucial that when deploying telemedicine systems, that organizations should focus not only on patient satisfaction, but also all other

internal uses of these platforms. They state that all staff should be considered internal users who are part of a of an interdependent value chain. To equally prioritize internal and external users would directly affect their performance and the overall satisfaction level and increase the value of the service delivery, leading to the statistical hypothesis S02H15: "*Satisfaction will have a positive effect in Acceptance".*

4. Dimensions identified for study

Following the analysis of different cited studies, we have gathered foundations to propose possible connections between dimensions, impacting satisfaction and future use, as explained in figure 1.7.1.1.

Figure 1.7.1.1.
Theorical model



The considered characteristics for telemedicine which could potentially affect *acceptance (and future intention of use) and overall satisfaction* englobe *easiness of use* (for all users), and *system usefulness* (how useful and practical can this system be) and overall *quality* (which can allow for further specification of analysis such as quality of communication and interface and interaction. In this framework, *trust and self-efficacy* are also considered moderating variables on the intensity of the relationships between the characteristics above mentioned and quality.

CHAPTER 2

Presentation and Description of Empirical Studies

The studies presented in this dissertation are divided into a primary qualitative study, conducted with the use of informal interviews to retrieve information about Portugal's current telemedicine use, and a second quantitative study, using an online questionnaire to better understand factors that determine the satisfaction and acceptance of telemedicine.

2.1. Study 1: The Present- National Reality of Telemedicine

2.1.1. Purpose of the study

Not many approaches have been proposed to classify the impact of telemedicine in Portugal and relationship between satisfaction and perception. Moreover, not only there aren't many approaches on the topic, as there are also no records of either patients or clinicians' views on the already existing telemedicine methods. Qualitative research is addressed by Polit and Beck (2004) as a method to illustrate the dimension of the topic of the study, along with the investigation of its nature and the different ways it manifests itself. We will be focusing on the contextualization and pertinence of the theme, along with the clarification of all research questions in this part.

2.1.2. Methodology

Exploratory research is outlined as the primary method of research, exploring topics, resulting in a range of probable causes and possible solutions to the research problem presented (Saunders, Lewis, and Thornhill, 2019). Descriptive research on the other hand, is intended to describe various aspects of the occurrence through data collection, yielding information that would not otherwise be visible (Moore & Kempson, 2013). The combination of these types of research methods can then be used to classify and contextualize the information to a specific niche.

2.1.2.1. Instrument

As research instruments in the qualitative study, semi-structured interviews, conducted in Portuguese were chosen. As a primary source of information, the data collection method chosen through semi-structured interviews for exploratory studies made to six health professionals, as a way of scanning for the existence of telemedicine practices in their respective institutions and

their opinion on the matter. The interview with a summary depth seemed like the fit for the situation, as supplementary questions can be done to further deepen our knowledge on a certain part of the topic we are investigating (Kothari et al.,2013).

The use of this instrument was fixed with the primary objective of identifying different dimensions in patient and clinician-centred research as described in literature, using research of relevant work, and being able to describe those dimensions using the participant's view, allowing for the creation of links with our current dissertation topic and research questions. As so, our identified dimensions are Participant's perception, Their Use of telemedicine, Quality, Adhesion, Resistance, Satisfaction and Future Use, as abovementioned. Accordingly, the interview was composed of seven questions, one for each dimension, as represented in Table 2.1.2.1.1.

Table 2.1.2.1.1.
Identified dimensions on the topic, used for the elaboration of the interview questions

Dimension	Research Questions	Interview Question Asked
Participant's perception	RQ1: "What is the overall perspective of "telemedicine" In Portugal?"	"What is your understanding of the term "telemedicine"?"
Quality	RQ2: "Are the existing Models in Portugal considered to be of quality?"	"In your opinion, do you consider it to be a successful practice?"
Adhesion	RQ3: "What are the reasons for adhesion?"	"Is there adherence? Why?"
Resistance	RQ4 "What are the causes for resistance?"	"Is there resistance? Why?"
Satisfaction	RQ5 "What can be done to increase satisfaction levels?"	"Do you think there is anything that can be done at this point to improve both clinicians and patient's satisfaction with telemedicine? If so, what?"
Perceived use	RQ6: "What is the current use of telemedicine in Portugal?"	"Do you have any telemedicine models in your institutions? If so, in which way are they used"
Future Use	RQ7 "Is there potential in investing in telemedicine for the future?"	"Do you think it will be a practice that will continue to be used in the future? In what way?"

2.1.2.2. Participants

The collection of data was made to six different health professionals regarding the use of telemedicine in their workplace. The sample for this study consists in a convenience-based sample (Burns, Grove, and Gray, 2014) from personal contacts with professional experience in healthcare. By collecting different views and opinions on the theme of telemedicine effectiveness, we safeguard a somewhat balanced sample. This was made by stipulating a

specific criterion for this sample, which was for all respondents to be working in hospitals in Portugal, for them to be in different healthcare institutions, and in different areas of Lisbon. The subjects of this sample are all healthcare workers, in which two are doctors, two have administrative roles, one is a nutritionist and the last is a pharmacist. Further description of the participants is shown in Table 2.1.2.2.1.

Table 2.1.2.2.1.
Characterisation of the study participants

Participant	Age	Gender	Function	Region of Institution	Years of Practice
1	45	F	Internal Auditor	Amadora (P1) [a]	2
2	47	F	Anaesthesiology Coordinator	Santarém (p) [b]	5
3	30	F	Clinical Nutritionist	Cascais (p)	5
4	30	F	Family Doctor	Santo António dos Cavaleiros (P1)	4
5	43	F	Hospital Director	Setúbal (p)	18
6	28	F	Pharmacist	Vila Franca de Xira (P1)	4

[a] Reflects institutions with a public regime.
[b] Reflects institutions with a private regime.

2.1.2.3. Procedure

Preceding the elaboration of the questionnaire questions, previous research has been done to better fit our research questions to our audience, as described in the previous sections. The first step in the procedure was the construction of the interview script, which was written with the identification of our topic's dimensions and subdimensions from literature. When partaking the interview, all participants were informed of the ambit of the study and were assured that their identify would be protected throughout the whole research process. The interview was made by text, and people were reached using social media platforms LinkedIn and WhatsApp, where all contributors were asked the same questions and were partaking the interview in the same environment (calm and with time to reflect). The interviews were conducted over text and then transcribed for comparison and record (see annex A).

The procedure used for the treatment of the gathered information was based on content analysis. It is described by Bardin (2010) as a set of communications analysis techniques aimed at obtaining, by procedures and objectives of describing the content of messages, indicators (quantitative or not) that allow for the inference of knowledge relating to the content of the

message. As we are treating qualitative data, we then summarised the information given and were able to make a comparative table for analysis. Vala reflects on content analysis based on the entire categorization process according to Bardin as a method to "making inferences, based on an explicit logic, about the messages whose characteristics were inventoried and systematized" (Vala, 1986, p.104), which was the thought process used in the organisation of information for this study. With the analysis of the content of interviews, we could then formulate hypothesis on the factors that could potentially affect the effectiveness of telemedicine, in a way that we can propose primary hypothesis that will potentially conduct the way the next study will be carried out.

2.1.3. Results

The list of interviewees questioned included professionals who both had and did not have telemedicine practices in their institutions. They were then asked how useful they found telemedicine to be, the benefits and disadvantages they found in them, according to their knowledge on the matter. It is important to note that opinions may vary, and the interview answers were solely based on the perception that health professionals had of telemedicine and its use in their specific context, as shown in table 2.1.3.1.

Table 2.1.3.1.
Comparison of interviewees view on telemedicine in their institution

Research Question	*Participant 1*	*Participant 2*	*Participant 3*	*Participant 4*	*Participant 5*	*Participant 6*
"What is the overall perspective of "telemedicine" In Portugal?"	The act of providing care at distance using online technology	The act of providing care at distance using online technology	The act of providing care at distance using online technology	The use of telecommunications to contact the user in healthcare.	The act of providing care and viewing exams at distance using online technology	The act of providing care and viewing exams at distance using online technology
What is the current use of telemedicine in Portugal?"	There isn't one, as was a failed implementation	Yes, in the form of tele/video consultations	Yes, in the form of teleconsultations	No due to infrastructure and mentality	Yes, in the form of tele/video consultations and imageology	Yes, in the form of SMS prescriptions and phone consultations for prescription renewal

Research Question	*Participant 1*	*Participant 2*	*Participant 3*	*Participant 4*	*Participant 5*	*Participant 6*
"Are the existing Models in Portugal considered to be of quality?"	No, as there is lack of knowledge on the matter	Yes, as it has allowed for consultations even at distance	Yes, it brings more satisfaction to travel, and consultations are well organized	No, as most staff is "narrow minded"	Yes, the consultations are having positive feedback from both parts	Yes, good feedback for pharmacy, medical staff shows availability and people appreciate the convenience
"What are the reasons for adhesion?"	There was no adhesion due to lack of information and bad infrastructures (no follow through)	Yes, but there is more adhesion in more central areas such as Lisbon	Yes, but only in some specialties	Not enough, there is recognized potential but no changes to implement the program	There is adhesion but there are patients that feel the need to be physically examined	There is adhesion for the most part, but some elderly people have no assistance at home
"What are the causes for resistance?"	Lack of knowledge makes it an added effort	Not sure about resistance, but there wasn't much adhesion expected	Specialties that require physical consultation	People have a very traditional mentality, fear of added work and lack of resources	There is difficulty in accepting this type of medicine and change	Lack of infrastructures and existing apps need updating
"What can be done to increase satisfaction levels?"	Convey information in a better way	Improving technology interfaces and training health	No, not for now.	Better conveyed of information	Patients monitored with equipment at home and the record fall directly into our systems.	Availability for helping, teaching, and assisting both medical staff and patients
"Is there potential in investing in telemedicine for the future?"	Yes, if it is well implemented will allow for more dimensions in hospital delivery	The bet on telemedicine is here to stay, there are specialties that will remain such as paediatrics	Yes, if physical gaps compensated	Yes, in better accessibility, guarantee continuity of care and training between doctors.	Yes, there's still a long way to go to overcome fear	Better electronic resources and assistance for elderly people

The first participant narrated the implementation of telemedicine in the institution as failed, as it was a rushed and unorganized attempt, along with very little information given to professionals on the topic. This auditor proclaimed to understand the importance of this practice in the future for better access of care. Regarding measures for bigger satisfaction with TM, she advised to convey information better so that both patients and clinicians understand the full capacities of telemedicine and feel excited about using them for their benefit.

On the other hand, the second partaker stated that in her institution, telemedicine is a practice that has been implemented smoothly, but the geographical region makes for little adhesion, as it is mostly populated by senior members. In paediatrics, there is a daily teleconsultation service that serves as an alternative to the permanent paediatric care services that closed at this time, keeping open only the face-to-face service of the hospital. There is not

as much adhesion as she expected but believes the investment on telemedicine is here to stay and there are specialties that will remain using it. As for the increase in satisfaction she believes its necessary for professionals to adapt the format of a consultation to telemedicine, especially for older physicians, and to make technology user friendly.

The third participant's hospital has also implemented telemedicine smoothly, as there is no need to increase satisfaction. She believes it brings more satisfaction to those who find it difficult to travel to the place where the service provider is, being one more way to have access to the service and the teleconsultations are well organized. Yet, her specialty requires physical consultation for body mass, weight, and height measures. As so, this participant believes telemedicine to be an important complementary method now and, in the future, but not the only method one in her specialty.

Interviewee 4 understands that telemedicine is a mean of making medicine available to everyone, at no cost or at a reduced cost, in a way that simplifies the life of the user and, in a way, the life of the doctor, ensuring continuity of care in the future. Her family health unit is mostly composed of senior staff members, making the mentality and lack of resources (unless personally funded) huge obstacles for the implementation of telemedicine models. This doctor also added that the fear of work overload associated with telemedicine (due to lack of knowledge and/or support) also create barriers for telemedicine. She, again, also believes in the huge impact of telemedicine in the future for monitoring and training for medical staff but sees "closed" mentality as a huge gap to be filled.

The fifth participant explained that in her institution, video consultations are considered very simple to perform, yet it is still perceived that both doctors and clients have a bit of difficulty in accepting this type of medicine. She also states that when patients try it, they like it and want to come back. But there is a part who wants to be physically examined (have their blood pressure checked, be auscultated, etc.). When it comes to increasing satisfaction, there is still a long way to go to fully implement the practice. In this time of pandemic, the hospital realized that both doctors and clients had the need to do it, so it's been a good experience. When it comes to future uses and satisfaction, there are projects (not reported in Portugal) where patients monitored with equipment at home and the record fall directly into our systems, as it would be a quick and easy way to treat the patient when they need it and increase satisfaction.

The last participant gave her opinion based on direct feedback from medical staff and patients using telemedicine services in the pharmaceutical area. She explained that for most patients, asking the hospital to schedule a call with a doctor for the renewal of prescriptions wasn't a complicated task, however most elderly people complained with lack of resources to

find the hospital number. As for dispensing their medication, almost all patients in contact with the participant thought that getting their prescriptions on their phone and just having to present them was very useful and they would most likely keep using electronic prescriptions. However, about elderly people, many also noted that when scheduling actual video consultations that many live alone and have no resources or people to help them get connected.

As alternative sources of data, literature and various articles were reviewed and used as guides to general questions that were asked to clinicians about their knowledge in telemedicine. The use qualitative research allowed for the formulation of research questions, along with the awareness of the differences between different practices and locations, represented in table 1. This research has allowed us to speculate about the influence of location, knowledge on the matter, years of practice or specialty in the use of telemedicine. In this research, respondents were asked for their opinion on the seven dimensions identified in literature, answering the same questions regarding their specific institution and personal experience. After the termination of the interviews, these were transcribed and compared to uncover common patterns and differences, useful for the formulation of study hypotheses for the second study (see Appendix A).

2.1.4. Discussion

The main objective of our first, exploratory study was to answer all the research questions created, using the different dimensions found in literature. The main goal after characterizing these questions is to make inferences for future research, that can be further validated in the subsequential study.

When assessing participants' perception in our different study areas, we were able to distinguish patterns and variances across different institutions, becoming more aware of the context of telemedicine in Portugal, to further measure up to satisfaction. When investigating the overall perspective of telemedicine (RQ1), it was across the six interviews that all participants mostly defined telemedicine referring to telemedicine only on the care of health segment, through enabling healthcare at distance, with one referring to teaching for health professionals, which aligns perfectly with the description of telemedicine chosen to represent this study. This draws attention to the probability that telemedicine is a known concept by medical staff, with the most common perception of telemedicine being solely to provide care of health regardless of the distance between physician and patient.

As for the Quality in the implementation of telemedicine (RQ2), it was noted across all institutions with active video consultations, the existence of positive feedback from both parts.

However, it is to consider the fact that even if well implemented, teleconsultations are not well fit to every specialty, as some require physical examination, such as nutrition. Another aspect to consider is the fit of online programs for elderly citizens, as they require assistance from family members or staff to set up their online consultations, or don't even own the required instruments. There are currently being set up partnerships between Portugal's mail company (CTT) and private Hospital Group CUF to create "CUF space" in which all citizens that do not have the capacity to perform teleconsultations at home can come in and have access to assistance and equipment to do so as smoothly as possible (CUF, 2020). This solution can be accessed in 5 different regions for now and incites for the investigation and proposal of further innovative solutions to increase the access to technology and assistance through Portugal, to increase adherence and satisfaction.

Pertaining to adhesion (RQ3), it was noted that this concept is directly related to satisfaction and resistance. The main reasons for adherence distinguished were relative to their success, meaning that, the main reason addressed for adherence in the participants was the fact that it would be a time saving, safe and efficient method, that would allow for care of health regardless of distance. However, the adherence to this platform only remains assured if these conditions are satisfied. This relativity suggests that there might be an association between people's perception of satisfaction and their will of adhesion to telemedicine, which would be a hypothesis to investigate in our subsequential study.

On behalf of resistance (S01RQ4), the biggest resistance causes related are mentality and infrastructure. As for mentality, this is divided into two ways. One is the fear of change and resistance to letting go of habits that have worked "fine" throughout the years, marking a traditional mindset that associates different methods to "added or unnecessary work", making people very adamant to change. The second one is the lack of knowledge, that leads to confusion and fear of use, confirming Ayatollahi, Sarabi and Langarizadeh's study (2015), that people who are not aware of the functioning and benefits of telemedicine have a proportionate intention of its use. Touching on infrastructure, this can be from either lack of both human and technological resources which was one of the cases, or misuse of the existent resources, due to lack of follow up measures, lack of formation on health professionals on how to use it (Capitão, Leite and Rocha, 2018).

Concerning the current use of telemedicine in Portugal (RQ6), not all institutions in Lisbon have running telemedicine, and it was noted that there were both programs well implemented and well organized, to organisations with failed and even with an impossibility of implementation of a telemedicine model. In the institutions that did have telemedicine practices,

it is so far only used in the form of tele/video consultations, with one of them also including imageology. As there are institutions with failed or flawed models of Telemedicine, it is important to further investigate existing models, their current flaws and define strategies for improvement.

Regardless of the success of telemedicine in their workplace, the five participants all stated they were aware of the potential of telemedicine now and in the future (RQ7), going in consonance with Capitão, Leite and Rocha's 2018 study in Portuguese hospitals and Albarrak's 2021 research, enforcing the common knowledge of the benefits of telemedicine, if well implemented. Being aware of its importance and use for better accessibility, construction of more dimensions in the delivery of healthcare, continuity of care and training between doctors, and possibly the continuation of video consultations for monitoring and check-up appointments were some of the uses of telemedicine in the future recommended by the partakers.

When approached on actions to increase satisfaction (S01RQ5), it is to notice that better conveyed information was mentioned in more than one interview, followed by training health care professionals to better understand, and use technology resources, along with improving their technological interfaces. Another suggestion was the implementation of at-home screening devices that would allow for direct results in hospital's databases, connecting back to Lin et al's 2017 research in the use of home-based tele transmission. This investigation relates an effective reduction of all-cause mortality and heart-failure related hospital admissions with tele-transmission, being a potential filled idea for Portuguese healthcare monitorization and prevention.

2.1.5. Summary conclusion

Concluding, this study has reflected on many areas to further investigate, and the association in lack of knowledge and intent to use shown in literature create a base for possible connection between perception of telemedicine, and its future intention of use. With better information passing and training, the perception of the scenario of an evolved telemedicine system could possibly correlate to bigger satisfaction in the delivery of care of health in Portugal, through our participants perspective. The identification of recurring patterns in our participants, from the telemedicine conditions described, allow us to create a model with different categories that are related to satisfaction recurring from certain telemedicine conditions, such as easiness of use.

2.2. Study 2: The Future: Determinants of Telemedicine Acceptance

Through our theorical model of investigation (page 22), created through the present situation of our national status in telemedicine acceptance and use in qualitative research, we can now present a quantitative study to statistically process our study hypotheses, and validate a descriptive model to understand future determinants of telemedicine use in Portugal.

2.2.1. Purpose of the study

Through the need to assess the practices and considerations in which telemedicine models are implemented, along with the effectiveness and its possible impact in the satisfaction with these measures, we will be taking into consideration the view of patients and clinicians on the matter. As we plan to conduct a study to add knowledge to the area of an identified gap, we propose the use the information and further comparison to existing literature, integrating previous knowledge with new information obtained with the study in progress.

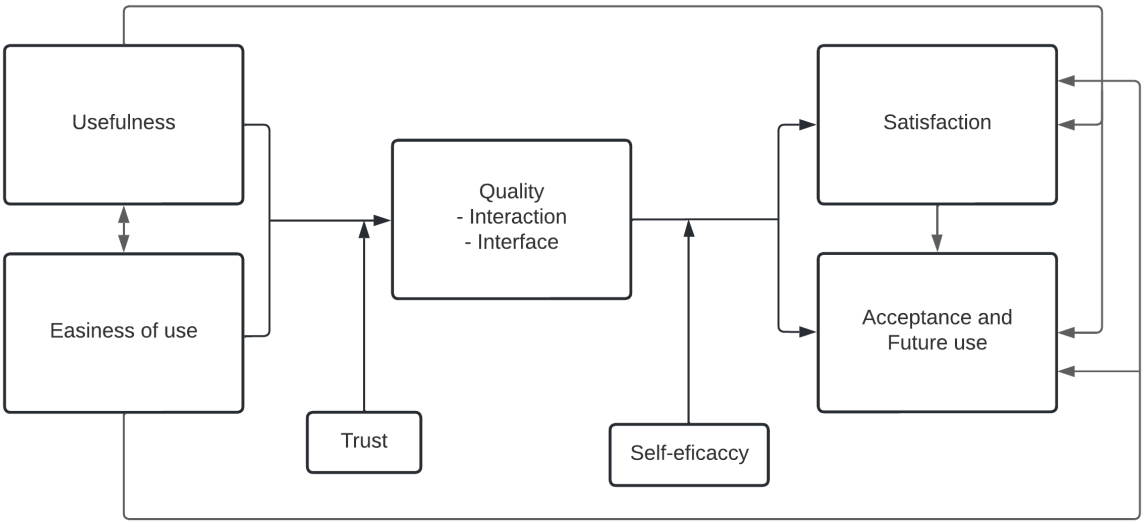
2.2.2. Methodology

Pertaining to quantitative research, described by Burns, Grove, and Gray (2014) as the planning and implementing of the project along with the communication of findings. All the collected facts are developed, clarified, strengthened, and implemented in this study, also generating further research. The chosen model for this descriptive approach is based in the review of existing literature using statistical and thematical analysis to test for any relationship between our variables. With the use of this resource, we can analyse samples, describe the performance of those measures, develop sampling strategies, and refer to statistical textbooks to explain the results of the data analysis.

With our chosen method of approach, we expect to provide a process that allows the development of scales consistent with the participants' different views (Burns, Grove, and Gray, 2014). For the analysis of the hypotheses, we have conducted initial research to check if the variables to be used in our model were identified in the literature. Having verified the association between the variables, we propose a theorical model that will be explored. The evaluation of results following this investigation will then evaluate the validity of the proposed hypothesis. With the information gathered from the literature review, it was possible to create a descriptive model for the assessment of telemedicine correlations and aspects of satisfaction, shown in figure 2.2.2.1. The model was created taking into consideration the characteristics of

telemedicine, the idea of quality perceived by both providers and patients of these characteristics, and consequently, their results in overall satisfaction and continuity of use in the future.

Figure 2.2.2.1.
Descriptive model created



Considering the characteristics used in our primary theorical model, we have created a more descriptive model for telemedicine which could potentially affect satisfaction. This model englobes easiness of use (for all users), and system usefulness (how useful and practical can this system be) as starting variables. As for aspects of quality that might hypothetically affect acceptance (and future intention of use) and overall satisfaction, we have quality of communication (can the information be transmitted in a clear way? If so, is the quality of the information high enough to allow correct diagnosis) and quality of the interface (can we hear and viewing, user friendly systems). Moderating variables were considered, such as trust in the process and staff, and self-efficacy, which will be tested in our descriptive study.

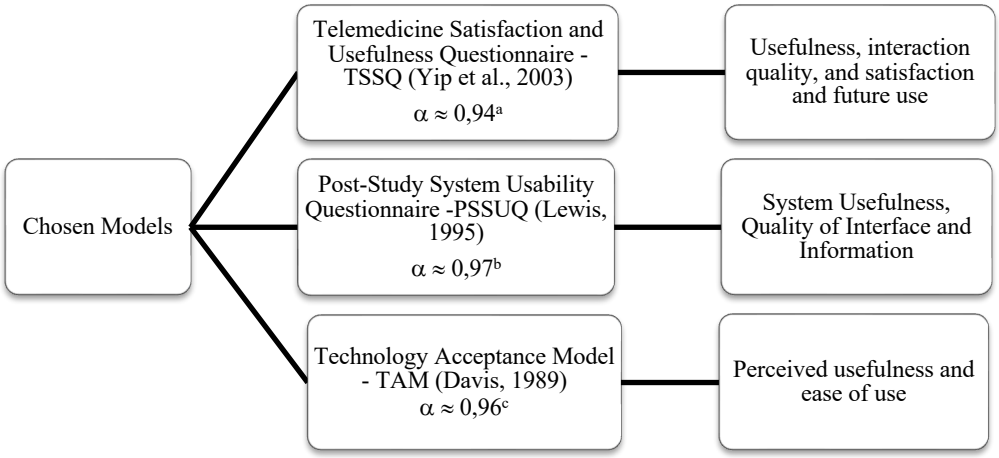
Previewing this, we will conduct a primary analysis on our second study (S02P1) to see if all of the variables present in the graphic are correlated with each other, and if there are differences depending on the characteristics of the user, creating our primary hypotheses S02P1: *"There is a relationship between all of the identified variables"* and S02P2: *"There is a difference between the perception of Clinicians and Patients on telemedicine"*. Along with the information collected in the first explorative study, primary data in the form of peer revied studies and articles were used to formulate a Question Matrix on the questionnaires directed to clinicians and patients, along with their contribute for research questions. There will also

pretesting and pilot testing measures to troubleshoot any concerning matters and assure the quality of the questionnaire. Further data collection was retrieved with the use of an online questionnaire, using the google forms platforms as the distribution method. The use of questionnaires will allow for the collection of exploitable answers from a significant sample.

2.2.2.1. Instrument

Questionnaires have been the most used instruments to assess people's perception on telemedicine. Hajesmaeel-Gohari and Bahaadinbeigy (2021) have assessed 53 articles using questionnaires to evaluate telemedicine services, as the ones chosen to analyse our model are shown below in Figure 2.2.2.1.

Figure 2.2.2.1.1.
Chosen questionnaire models to evaluate telemedicine and their area of evaluation



a Factor analysis for this questionnaire involved two factors, video visits (α=0,96) and use and impact (α=0,92) (Bakken et al.,2006).

b Reliability for PSSUQ has corresponding coefficient alphas of 0,96 for usefulness and 0,91for both quality of telemedicine interface and quality of telemedicine information factors (Lewis, 1995).

c The paper showed reliability between two studies, resulting in two six-item scales: usefulness (0,98) and ease of use (0,94) (Davis,1989)

Parmanto et al., in 2016 explains Cronbach's Coefficient Alpha Ranges of Acceptability, with values from 0,7 to 0,8 being acceptable, 0,8 to 0,9 as good, and over 0,9 to be excellent. As the reliability for the chosen models, tested in previous studies, was proven to be excellent ($\alpha \geq 0,9$), the use of sections of these questionnaires as a base for our study questionnaire will allow us to evaluate people's perception in all different quality areas considered in our investigation model, being a reliable instrument of data collection. According to our model, we will focus our questionnaire questions to user satisfaction, system usefulness, easiness of use, quality, and satisfaction. When it comes to creating models for measuring perception towards creating better developed programs for the future, the first step is to recognise the areas in which

we can find liabilities, create personalised models to assess them, and subsequently disclose ways to overcome them.

When it came to the conception of the questionnaire, content analysis was again used in the form of categorical analysis, by the gathering of information from the first study and literature, we could then separate use the research questions of this dissertation as categorical elements and use literature to help formulate our question matrix along with the method of in which those questions will be answered, following the Likert Model (See Appendix B). The questionnaire was elaborated according to the identified dimensions in our theorical model. It is encompassed of 25 questions in total for patients, and 26 for medical staff. As so, the first 10 questions (regarding sociodemographic details and familiarity with technology) were the same for both groups. After the initial questions, the questionnaire was divided in 15 questions for patients and 16 questions for health professionals, being presented in accord to their respective group selection, with the same questions, but with contextual differences. As the questionnaire is based on opinion research, it was elaborated using the Likert Scale Method (Jamieson, 2004) to understand the degree of agreement with our topic (see Appendix C).

As this study will be based on the different views and opinions of the participants, content analysis on the first exploratory study allowed for the formulation of hypothesis that in this phase can then be further categorized and analysed, using the questionnaire as the research instrument. Other statistical sources of data will be collected from the National Health Services website (SNS) and the National Institute of Statistics (INE) to complement the information and provide a guide to interpret the results in comparison to previous years or conditions, using date range and the type of consultation as criteria (Patino & Ferreira, 2018).

The chosen language for the questionnaire was Portuguese, as it is the national language, and all interviewees should be able to speak it and understand the questionnaire. The questions were adapted from existing questionnaires and were translated by two bilingual people from English to Portuguese, adapting some questions to the context and literacy of our sample.

2.2.2.2. Variables

The fundamental variables (Table 2.2.2.2.1.) to explore in this study are composed by the items present in the dimensions: self-efficacy (Davis, 1989), Easiness of Use (Davis, 1993), perception of System Usefulness (Yip et al., 2003), Quality of telemedicine Interface (Lewis, 1995), Quality of telemedicine Interaction (Yip et al,2003), Satisfaction (Yip et al,2003) and Acceptance (Yip et al., 2003 and Davis, 1989). We have also added the dimension “Trust”, to validate the effect it might have in the relationship between variables.

Table 2.2.2.2.1.

Defined variables and their question distribution in the questionnaire

Dimension	*Subdimension in analysis*	*Question*	*Source*
Self-efficacy	Self-Efficacy	• I am proficient at using the device for telemedicine service. • I have rich experiences on the device. • I am good at the device. • I am able to use the device properly.	TAM (Davis, 1989)
telemedicine Characteristics	Easiness of Use	• It was simple to use this system • It was easy to learn to use the system • It is easy to perform my consultation using this service • I believe I could save time using this system	TAM (Davis, 1993)
	Perceived Usefulness – Patients Only	• Telehealth improves my access to healthcare services • Telehealth saves me time traveling to a hospital or specialist clinic • Telehealth provides for my healthcare needs	TSQ (Yip et al.,2003)
	Perceived Usefulness – Health Professionals Only	• It will positively affect the treatment plan. • It is possible to provide more comprehensive care service. • It is efficient for diagnosing patients and scheduling. • I can precisely monitor the patient's condition.	TAM (Davis, 1989)
Perception of Quality	Interface Quality - Logistics and efficacy of electronic systems	• The way I interact with this system is pleasant • I like using the system • The system is simple and easy to understand • This system is able to do everything I would want it to be able to do	PSSUQ (Lewis, 1995)
	Interaction Quality - Communication	• I could easily talk to the clinician/patient using the telehealth system • I could hear the clinician/patient clearly using the telehealth system • I felt I was able to express myself effectively • Using the telehealth system, I could see the clinician /patient as well as if we met in person	TSQ (Yip et al.,2003)
Quality	Overall quality of care	• I think the visits provided over the telehealth system are the same as in-person visit	TSQ (Yip et al.,2003)
Trust		• Overall, I trust in the medical service provided by telehealth	
Results	Satisfaction and Future use (Acceptance)	• I feel comfortable communicating with the clinician/patient using the telehealth system • I have a positive intention to adopt the telemedicine service.	TSQ (Yip et al.,2003) TAM (Davis, 1989)
	Behaviour Intention of Use - Acceptance	• Telehealth is an acceptable way to receive healthcare services • Overall, I am satisfied with this telemedicine system	TSQ (Yip et al.,2003) TAM (Davis, 1989)

Note: The only variable in which there were entirely different questions, instead of contextual differences was "Perceived System Usefulness".

2.2.2.3. Participants

The chosen sample was a diverse sample of both patients and health professionals from Health institutions in the central Lisbon region. The original response size for the questionnaire when sent was for 150 participants (both patients and health professionals) to be contacted and questioned. We gathered data from 114 answers, but 34 respondents hadn't had contact with

telemedicine to date. The valid sample is constituted by with 80 participants, 50 patients (62,5% of sample) and 30 medical practitioners (37,5%) with contact with telemedicine, yielding a response rate of 71%.

As for type of user, Health professionals are composed of a predominance in Female participants with a 56,7% female and 44,3% male sample. From these we can infer that a large part of participants has at least a bachelors (30%) degree, with almost the same percentage of Postdoctoral studies (27%) and being the most prominent master's degree (37%). Patients follow a similar distribution, both on gender and scholarity levels, showing a predominantly female population (58%) and with nearly 50% of the population with a bachelor's degree, and 30% with a master's degree, deferring on the Postgraduate level, which only 2% of participants had. From statistical correlation we have detected no statistical difference between different types of users.

2.2.2.4. Procedure

The intent with the mixology of study methods has as a goal to combine all retrieved information and use it to better understand the theme and answer all research questions, as well as identify limitations and further research on the topic. Data presentation and analysis will be done taking into consideration a quantitative method. Google forms was the platform chosen for the diffusion of the questionnaire as it is a safe and reliable tool, adequate for this type of study.

The instrument used in this quantitative phase was an online survey questionnaire, available on Google Forms, which was dispersed in a snowball method, through social media such as WhatsApp, LinkedIn, and email. This method of dispersion was chosen as it allows for a larger sample reach, spreading from a small group of individuals to a significant number of participants (Kirchherr & Charles, 2018). The responses to the survey present an insight on the sample's perspective to extrapolate an overall opinion of each group on the matter and provide external validity to the study (Lowry, 2015). The survey was collected over a four-week period extending from August 26 to September 27. Simultaneously, we have contacted the Portuguese telemedicine Association via e-mail, who has ensured the distribution of the questionnaire for both members and non-members of the association, on the same time period.

For quantitative analysis, all the samples were statistically analysed using SPSS (Statistical Package for the Social Sciences 28.0) platform for statistical categories, which will then be used to correlate information between all sets of data.

Ethics and confidentiality for both qualitative and quantitative research were assured, as participant's identity should be protected and concealed throughout the elaboration o this dissertation. The participants were informed and ensured that the data provided by their responses will be treated in a confidential matter and will not be shared or revealed to third parties. Therefore, the questionnaire did not include any identifying questions to ensure that the study would refrain from breaking confidentiality protocols.

2.2.3. Results

The use of instruments allows for the measurement of concepts or ideas, but validity and credibility are concepts to always consider in the mensuration those concepts. Validity is interpreted as the extent in which instruments assess on what they are supposed to assess, and reliability is the measure in which this validity is consistent. That said, an instrument is only valid if it is reliable.

For correlation analysis, we have identified five factors through a Rotated component Matrix, also identified as reliable. However, the low number of participants has impeded the validation of these factors for our theorical model, which can be found in Appendix D.

The reliability of this study will be measured using Cronbach's alpha coefficient, as it is a statistical test commonly used to measure reliability (Tavakol & Dennick, 2011), as described in table 2.2.3.1.

Table 2.2.3.1.
Internal Consistency of the identified dimensions

Dimension	Cronbach's Alpha Coefficient
Self-efficacy	$\alpha = 0{,}820$
Easiness of Use	$\alpha = 0{,}852$
Quality Interface	$\alpha = 0{,}870$
Quality Interaction	$\alpha = 0{,}772$
Satisfaction	$\alpha = 0{,}895$
Acceptance	$\alpha = 0{,}910$

Note. As the dimensions "Overall Quality" and "Trust" are encompassed of one question only each, these could not be measured for reliability.

The Academic Self-Efficacy Scale was presented with 6 items. The quotations on this scale showed good reliability, measured as internal consistency (Cronbach's alpha = ,80). As α coefficient values are > 0,6, no items from the identified factors were withdrawn.

Next, by measuring Pearson's correlation coefficient between our variables (full table in Appendix E), we can validate our primary hypothesis (P1) for correlation of all variables and understand the strength and direction in which they are linearly related, characterized in table 2.2.3.4.

Table 2.2.3.4.
Measurement of correlation between our identified variables

			Qual a sua idade?	Habilitações literárias	Self-efficacy	Easiness_of_use	Usefulness	Quality interface	Quality interaction	Trust	Satisfaction	Acceptance
	Mean	SD										
Qual a sua idade?	39.250	11.762	--									
Habilitações literárias	4.310	1.165	**-.243***	--								
Self efficacy	4.038	.616	-.180	.102	--							
Easiness_of_use	4.131	.617	**-.271***	-.014	**.561****	--						
System Usefulness	4.009	.790	-.158	-.097	**.428****	**.587****	--					
Quality_interface	3.869	.688	**-.383****	.068	**.462****	**.691****	**.630****	--				
Quality_interaction	3.728	.669	**-.263***	-.026	**.264***	**.492****	**.626****	**.678****	--			
Trust	4.000	.842	-.190	.065	**.293****	**.414****	**.667****	**.486****	**.656****	--		
Satisfaction	3.983	.737	-.086	.070	**.357****	**.466****	**.610****	**.514****	**.650****	**.783****	--	
Acceptance	4.019	.700	-.173	.063	**.402****	**.521****	**.715****	**.560****	**.551****	**.719****	**.737****	--

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed); N = 80; SD: Standard Deviation

According to table 3.1.2.4., most of the identified dimensions are correlated with each other in a harmonious way. Self-efficacy is moderately correlated with easiness of use (r = .561, $p \leq .01$, N = 80), which in turn has quality of telemedicine interface as a moderate correlation (r = 0.691, $p \leq .01$, N = 80). As for system usefulness, it shows its strongest correlation with acceptance (r = .715, $p \leq .01$, N = 80), which in turn has Trust as its strongest correlation (r = 0.719, $p \leq .01$, N = 80). quality of telemedicine interaction has a moderate correlation with quality of telemedicine Interface (r =.678, $p \leq .01$, N = 80), which also shown nearly a 0.7-moderate correlation coefficient with easiness of use (r =.691, $p \leq .01$, N = 80).Trust and

satisfaction are the only variables with the matching values for strong correspondence (r = 0.783, $p \leq .01$, N = 80), with satisfaction also having acceptance's as their strongest correlation (r = .737, $p \leq .01$, N = 80). Moreover, the relationship between all variables before mentioned follow a positive direction.

On the other hand, all variables are negatively correlated with the sociodemographic dimension of age. This suggests that over time, people have a lower correlation with literary abilities (r = -.243, $p \leq .05$, N = 80), easiness of use (r = -.271, $p \leq .05$, N = 80), quality of telemedicine interface (r = -.383, $p \leq .01$, N = 80) and quality of telemedicine interaction (r = -0.362, $p \leq .05$, N = 80). The sociodemographic factor literary abilities has shown no significant relationship with any variable, neither in a positive or negative direction.

From these results we can validate our S02P1, confirming that all variables are indeed correlated to each other, except for the literary abilities variable.

After identifying correlations in our different variables, we performed a Levene's Test for equality of means on our data to validate the variability of data in our two groups, that is, if the data is homogenous or not.

From this, we can validate our other primary hypothesis (P2) for difference in perceptions between medical staff and patients, by performing a T-test to assess if our independent sample means are significantly different. Equal variances in the analysis of data were assumed, after recognizing our values of *p* to be bigger than .05 (full T-Test table present in Appendix F). We can observe in table 2.2.3.5. our t-values for the relationship between variables.

Table 2.2.3.5.

Measurement of t-values of means between our identified population groups

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Two-Sided p	Mean Difference	Std. Error Difference
Self_efficacy	Equal variances assumed	1.937	.168	-.606	78	.546	-.08667	.14292
Easiness_of_use	Equal variances assumed	.006	.937	-3.241	78	**.002***	-.43667	.13473
System Usefulness	Equal variances assumed	3.338	.072	-3.519	78	**<.001****	-.60027	.17060
Quality_interface	Equal variances assumed	1.970	.164	-2.445	78	.017	-.37667	.15406
Quality_interaction	Equal variances assumed	1.151	.287	-2.816	78	**.006**	-.41733	.14818

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Two-Sided p	Mean Difference	Std. Error Difference
Trust	Equal variances assumed	.492	.485	-.821	78	.414	-.16000	.19484
Satisfaction	Equal variances assumed	.069	.793	-1.858	78	.067	-.3113	.1676
Acceptance	Equal variances assumed	.912	.342	-1.347	78	.182	-.21667	.16086

From the two groups who evaluated their contact with telemedicine, Group "Patients" has a lower mean than "Medical Staff – clinicians" group, reflected by negative t-values. As in general there is no statistical difference between means, we are assuming equal variances in our analysis. From all our variables, even though they are correlated, we can identify that in categories easiness of use (t = -3.241, p = .002) and system usefulness (t = -3.519, $p < .001$), there is no equal variance between medical staff and patients, being differentiation factors in terms of opinion. We can also identify a tangential variance in the variable Quality of telemedicine Interaction, with (t = -2.816, p = .006). On the other hand, easiness of use is the category with the biggest p value, with a -.08667 mean difference.

As so, we can validate our P2 hypothesis, that the perception of clinicians and patients are different, in the variables easiness of use and system usefulness.

After analyzing the two primary hypotheses (correlation between variables and difference between sample groups) it is important to explore the validity of the proposed theoretical model. For this, the solution would be to apply hays mediation/moderation models and explore the results of the associated regression models. Both methods require compliance with a set of assumptions that we have not achieved in this study to ensure (namely the ratio of respondents/variables, among others). Neverthemore, with a purely exploratory characteristic, we have chosen to apply both methods. Using Macro Process' model 21, we have tested unsuccessfully the effects of these dimensions, as results did not validate the moderation and mediation model proposed in our descriptive model. However, we think it is pertinent to characterize the impact of each of these variables on acceptance to validate our descriptive model, using the three-step regression model, represented in table 2.2.3.6.

Table 2.2.3.6.
Summary of Variable Models Tested

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.736[a]	.541	.523	.48338	.541	29.908	3	76	<.001	
2	.796[b]	.634	.609	.43757	.093	9.374	2	74	<.001	
3	.821[c]	.675	.648	.41552	.040	9.062	1	73	.004	2.627

a Predictors: (Constant), Qualt_Glob, Easiness_of_use, Usefulness

b Predictors: (Constant), Qualt_Glob, Easiness_of_use, Usefulness, Self_efficacy, Trust

c Predictors: (Constant), Qualt_Glob, Easiness_of_use, Usefulness, Self_efficacy, Trust, Satisfaction

Dependent Variable: Acceptance

Our first model is constituted of variables "Global Quality", "Easiness of use" and "Usefulness", describing 54,1% of our results (r = .541, $p < .001$, N = 80). In our second model we have to added to our primary model measures of individual perception, being "Self-Efficacy" and "Trust", explaining 63,4% of results (r =.634, $p < .001$, N = 80). Our third model englobes all above variables, with the inclusion of "Satisfaction". Inferring on the results of this third model, with an R Square explaining 67,5% of our results (r = .675, $p < .005$, N = 80). As our R Squared values explain consecutively more of our results with the addition of new variables, we can assume that there is an associated effect to acceptance that increases with the development of our blocks. From this, we can conclude model 3 to be the most explicative one, further explained in table 2.2.3.7.

Table 2.2.3.7.
Coefficient result from Model testing

Coefficients [a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.	Collinearity Statistics: Tolerance	Collinearity Statistics: VIF
1	(Constant)	.919	.390		2.359	.021		
	Easiness_of_use	.100	.120	.088	.836	.406	.542	1.843
	Usefulness	.479	.098	.541	4.894	**<.001**	.495	2.022
	Qualt_Glob	.202	.132	.179	1.527	.131	.438	2.283
2	(Constant)	.547	.391		1.398	.166		
	Easiness_of_use	.107	.119	.095	.905	.369	.453	2.209

Coefficients [a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
	Usefulness	.288	.099	.325	2.912	**.005**	.396	2.525
	Qualt_Glob	.034	.126	.030	.270	.788	.394	2.540
	Self_efficacy	.084	.098	.074	.857	.394	.670	1.492
	Trust	.352	.083	.423	4.243	**<.001**	.498	2.007
3	(Constant)	.424	.374		1.134	.260		
	Easiness_of_use	.091	.113	.080	.805	.423	.452	2.215
	Usefulness	.283	.094	**.320**	3.012	**.004**	.396	2.526
	Qualt_Glob	-.036	.122	-.032	-.291	.772	.380	2.634
	Self_efficacy	.056	.093	.049	.596	.553	.664	1.507
	Trust	.175	.098	.210	1.780	.079	.320	3.126
	Satisfaction	.326	.108	**.343**	3.010	**.004**	.344	2,906

a. Dependent Variable: Acceptance

We could conclude from our previous analysis of results that the model that englobed the majority of results was model 3. However, from this table we can realise that the only dimensions with relatively satisfactory results ($p < .005$, N = 80) were usefulness and trust ($p = .004$, N = 80), converging with our descriptive model.

As so, we can infer that our model was validated in confirming relationships between all dimensions, however the only ones impactful in the acceptance of telemedicine showed to be *usefulness and trust.*

2.2.4. Discussion

The goal of the second study was to evaluate if there was a difference between the perception amongst Medical Staff and Patients in Portugal, and which variables could be further developed to better our current telemedicine system.

Regarding system usefulness, it was registered in Indria, Alajlani and Fraser's (2020) questionnaire to clinicians that Telemedicine was a service that most of the population found useful, reporting faster diagnosis, and treating. As so, by testing for the existence of a positive effect of system usefulness in satisfaction and acceptance, high correlation values confirmed to our theory, creating depth to the above-mentioned author's references of telemedicine.

These authors have also registered suggested improvement, including bettering service quality and resources, to improve quality of telemedicine care and increase self-efficacy. The theories that self-efficacy levels (from effective training), along with better resources (quality of telemedicine Interface) moderate levels of Satisfaction (H3) and henceforth levels of acceptance, were proven by the significant correlation between our three mentioned variables.

When it comes to the perception of telemedicine by both the Medical and Patient Group, it was noted by Ayatollahi, Sarabi and Langarizadeh (2015) and then Albarrak et al. in 2021 that the perception of telemedicine had an impact on the population's willingness to use it. Our identified variables for measuring perception relied on the population's easiness of use and consequent perception of System Usefulness, implying that there is a close relationship between these variables (H5), which is validated by their very significant correlation.

Zanaboni and Wotton (2021) explored in more depth the effect of perception in acceptance and resistance of telemedicine Services. It was stated that perceived System Usefulness was found to be a regulating factor in the quality of telemedicine care and use of telemedicine. A significant correlation was found between System Usefulness and Quality, both of Interface and Interaction, further reinforcing this hypothesis.

On the other hand, these authors refer that difficult to operate interfaces would affect people's decision to use them. In addition to this, Saigí-Rubió, Torrent-Sellens and Jiménez-Zarco (2014) international surveys have stated lack of knowledge of telemedicine resources to be item with largest power in regard to decision of use. As so, the hypothesis the quality of telemedicine the Interface is influenced by the way in which users find it useful and easy to use was proposed. This hypothesis was verified with significant correlation of quality of telemedicine Interface with Variables system usefulness and easiness of use.

As telemedicine implies trusting the resources available to deliver care of health. Villines (2020) lists several advantages in the use of telemedicine, however, people will only find it useful and of quality of telemedicine they trust that it will provide the same diagnosis as an in person visit. As so, the hypothesis that trust has a positive effect in the intensity of the relationship between system usefulness and quality of telemedicine care was proven by a significant correlation between the three variables.

Indria, Ajlani and Fraser (2020) report overall satisfaction from both groups with telemedicine services in monitoring and diagnosis, which reinforces the idea that good quality electronic resources have an impact in satisfaction, and therefore, satisfaction, proven by significant correlations between quality of telemedicine interface and the latter two variables.

In the matter of Satisfaction with telemedicine, Mao, Gigliotti and Dupre (2020) explain that quality of telemedicine management has been evaluated through satisfaction in communication and listening, and as so, the thought that Quality interaction would have an impact in Satisfaction was proven through very significant correlations between the variables.

It has been seen through different scholars that the easier telemedicine tools are to use, the more likely people will adhere to them and be satisfied with its service. These theories have been confirmed through strong correlations between easiness of use and variables Satisfaction and Acceptance.

Satisfaction should be equally important for both groups in this study, as described by Lockamy and Smith (2009), prioritizing internal and external users equally, and focusing on their satisfaction as well, in order to increase their future use of telemedicine devices. As so, we could corroborate through strong correlations that Satisfaction will have a positive relationship on acceptance, making people more willing to keep using it in the future.

Even though most of our variables have shown correlations, the only correlations that have shown to have a significant effect on acceptance are system usefulness and trust in the system.

From proving the existence of relationships all our variables we have also been able to prove that all variables are correlated with each other in a significant manner, except for literary habilities (P1), and realised that the opinion of clinicians and patients shows can be considered the same in almost all aspects, except for Usefulness and easiness of use (P2).

2.2.5. Summary conclusion

From this second study, we can conclude that three main factors have been identified when considering determinants for future use of Telemedicine. It was understood that variables age, self-efficacy, easiness of use, system usefulness, quality of interface and interaction, trust, satisfaction and acceptance are all correlated within each other, meaning that improvement in one of these areas can have a direct impact on the others.

The second factor to consider is the fact that, when it comes to the design of telemedicine interfaces, whether from an implementation or improvement point of view, easiness of use and system usefulness are approached by patients and medical staff in a distinctive manners, meaning both perceptions should be considered in this process. This differentiation could lead to a bigger appeal from both parts, resulting in bigger satisfaction and therefore, acceptance.

Our last factor to consider is the fact that from all of our variables, the only meaningfully affecting ones in determining future use of telemedicine services are usefulness and trust in the

system. As so, these should be the main areas of focus in developing tools for further acceptance and adhesion to Portugal's telemedicine services.

CHAPTER 3

Conclusion

Our first study meant to describe the current use of telemedicine, made by the Portuguese population, considering the point of view of both patients and medical staff. Through literature review, we gathered information regarding possible relationships between different affecting variables to telemedicine, identified by both groups, such as acceptance, satisfaction, quality, and easiness of use. From this initial research, we have proposed a theorical model of which of the variables which could possibly determine future acceptance and use of telemedicine services. This model has served as a base to create interview questions to Portuguese healthcare practitioners, in order to better comprehend which factors were relatable to Portugal's healthcare situation, being quality of communication and training the most notable affecting factors. From this, it was clear from our interviewees' point of view that Portuguese healthcare facilities require further training and education on telemedicine systems, both on staff and patients to create bigger willingness of use. However, it was of general opinion that telemedicine has great potential if well explored and implemented.

This information led to the creation of a second, more descriptive model which was tested in our second study, gathering information from the Portuguese population that had had contact with telemedicine. This study focused on these same variables, however predicting which causal and moderating relationships between them could lead to bigger acceptance of telemedicine.

From our second study, what we can firstly conclude from the relationship between variables, is that there is a mutual effect of usefulness and easiness of use on each other, which can mean that the easier the interface is to use, the more useful it will be found, for example. We have also seen a very strong relation between satisfaction and acceptance and future use, possibly indicating that the more satisfied people are with the system, the more likely they will be to use it recurrently. We have also identified quality (of the telemedicine interface and interaction) to be an impactful moderating variable between our main factors, which can lead to the idea that useful, better-quality equipment, allowing for more user friendly and effective interactions between users, can lead to bigger satisfaction levels, and in return, a bigger acceptance and willingness of use in the future.

Trust in the system's efficiency and Self efficacy in the use of telemedicine technologies have also shown to impact the intensity in which perception and satisfaction are correlated, as

people that trust that the system will be efficient, that find it easy to use and have practice with it, are much more likely to be satisfied and re-use this system throughout their lives.

The fact in general that there were no statistical differences between the means of patients and medical staff have allowed us to use this model to characterize the entire universe of users as a sample of the Portuguese population, making it a more wide-ranging study.

We have also uncovered that age has a negative correlation with these factors, translating that the older the population is, the less useful and user friendly they'll find technological services to be. Through the correlation between variables, this can reflect on lower satisfaction, acceptance, and willingness of use, regardless of the quality of the equipment. This poses an obstacle in implementing telemedicine services, which could be diminished with the existence of assistants in accessible places, ready to assist elderly people performing their consultations, which is an existing measure in Portugal, as mentioned in literature before.

Regarding obstacles, a possible limitation to this study was the access to healthcare professionals. As it is a profession that requires constant attention, there is always the risk that the Healthcare professional groups did not have the time to participate in this research, reflecting on a smaller sample. Lastly, as the questionnaire is only directed to people who have had contact with telemedicine, whether administering or receiving care, the number of responses was limited and harder to find, as we targeted a specific niche of participants.

As for further research on determinants for telemedicine use, deepening the knowledge on the specific impact of each variable, more so trust and usefulness, on the perception and acceptance of our universe. Additionally, a better understating of specific traits in Portuguese access to care of health and how to modify our current systems to accommodate specific needs according to region could help prevent more common pathologies associated to the Universe and lifestyle in question. This study can also be adapted to study telemedicine approach and acceptance in other populations, to better understand their own opinion on these matters and serve as a guide to more comprehensive measures in increasing adhesion to telemedicine.

From both studies, we can take away that the trust and usefulness that users have of telemedicine can impact their choice to use it, and their satisfaction with the services provided. Telemedicine has proven to be effective in monitoring patients over time and assisting people without need for physical assistance, allowing easier access to care of health and possibly making people more prone in checking their health status. Our two identified areas of impact, even though require further development and understanding, provide a starting point as areas to develop in existing and future telemedicine practices, generating a safe platform for both

patients and medical staff to communicate, breaking barriers of acess to healthcare, and allowing people to receive health anywhere, anytime.

From understanding user's perspectives and creating an environment of trustworthy and useful interfaces; to mitigating our present obstacles through more effective education and assistance to users, we can construct tailor made systems for better healthcare in Portugal, with more people monitoring their health, less people recurring to urgency care, and a bigger acess to healthcare, regardless of our location.

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Appendix A

Table A.1.

Interview Transcription for Exploratory Study

Interviewees	1	2	3	4	5	6
What do you understand by the Term "Telemedicine?"	The act of providing care at distance using online technology	Any medical or health care act where the patient and the physician or other health care provider are not present in the same physical space and require a Technological interface	The practice of medicine without being in the place where the patient is with consultations or exams performed at a distance.	The use of telecommunications to contact the user in healthcare. It is a mean of making medicine available to everyone, at no cost or at a reduced cost, in a way that simplifies the life of the user and, in a way, the life of the doctor, ensuring continuity of care	A fast way to reach the patient from a distance. Ability to view exams and report exams remotely. An innovative way to be able to monitor the patient without having to travel.	The act of providing care and viewing exams at distance using online technology
Do you have any telemedicine models in your institutions? If so, in which way are they used	There was a failed implementation attempt, it was a rushed and unorganized attempt, along with very few information on the topic	Yes, in the form of tele/video consultations	Yes, in the form of teleconsultations	No, there is no acess to any type of infrastructure unless you finance your own equipment.	Yes, in the form of tele/videoconsultations and Imagiology	Yes, in the form of SMS prescriptions and phone consultations for prescription renewal

Interviewees	1	2	3	4	5	6
In your opinion, do you consider it to be a successful practice? Why?	Yes, it allows for greater equity in access to healthcare services	Yes, as it has allowed for consultations even at distance	Yes, it brings more satisfaction to those who find it difficult to travel to the place where the service provider is. Basically, it's one more way to have access to the service and the teleconsultations are well organized.	Not in this institution as most staff is "narrow minded", but in my opinion I find it extremely helpful in monitorization.	Yes, the consultations are having positive feedback from both parts	Yes, good feedback for pharmacy, medical staff shows availability and people appreciate the convenience
Is there adherence? Why?	There was no adhesion due to lack of information and bad infrastructures (no follow through)	Yes, there is more adhesion in more central areas such as Lisbon	Yes, but only in some specialties, not for nutrition in particular, at least not for first consultations and body mass, weight, etc have to measured and regulated	Not, enough, they see the potential but haven't made any changes to implement the program	There is adhesion but there are patients that feel the need to be physically examined	There is adhesion for the most part, but some elderly people have no assistance at home
Is there resistance? Why?	Yes, but not sure why, maybe lack of knowledge on how it works, making it an added effort	Not sure about resistance, but there wasn't much adhesion expected in the implementation of programs as it is time consuming and not easy for everyone to understand, and this area	Yes, in specialties that require physical consultation	Yes, people have a very traditional mentality and practice of medicine, and the institution has no infrastructures to support implementation. Furthermore, practitioners are not pushing forward telemedicine as they think	Yes, there is difficulty in accepting this type of medicine and change. Video consultations are very simple to perform, yet it is still perceived that both doctors and clients have a bit of difficulty in	Some resistance due to lack of infrastructures and existing apps need updating

Interviewees	1	2	3	4	5	6
		contains a lot of senior citizens		it will add more work to their already busy schedule.	accepting this type of medicine.	
Do you think it will be a practice that will continue to be used in the future? If yes, in what way?	Yes, definitely if it is well implemented will allow for more dimensions in hospital delivery	In paediatrics, there is a daily teleconsultation service that serves as an alternative to the permanent paediatric care services that closed at this time, keeping open only the face-to-face service of the hospital. There is not as much adhesion as expected but the bet on telemedicine is here to stay and there are specialties that will remain	Yes, but there is a long way to go to compensate for the gaps that physical distance creates. So far, I think it works great as a complementary method only	Yes, accessibility for users who cannot go to the health centre and, considering the pandemic, to guarantee continuity of care I also think that telemedicine can be useful in training between doctors and health professionals to discuss cases, etc. Our congresses are all online now and allow more people to view them. However, there is a long way to go to change people's mentality	Yes, when the clients try it, they like it and want to come back. But then you have those who want to be seen by the doctor, have their blood pressure checked, be listened to etc. I think there's still a long way to go. In this time of pandemic we realized that both doctors and clients had the need to do it, so it's been a good experience.	Better electronic resources and assistance for elderly people

Interviewees	1	2	3	4	5	6
Is there Anything that can be done to improve both Patients and Clinicians satisfaction at this point? If so, what?	At this point, to convey better Information so that both patients and clinicians understand the full capacities of Telemedicine and feel excited about using them for their benefit	improving technology interfaces that would allow for more patient observation solutions - training health professionals to adapt the format of a consultation to telemedicine, especially for older physicians	No, not for now.	Yes, better conveyed of information for all staff to understand that is a facilitating technique with a lot of potential. Most of the "fear" to use telemedicine comes in my view from the lack of information	have some patients monitored with equipment at home and the record fall directly into our systems. It would be a quick and easy way to treat the patient when they need it. We would do it at home if necessary.	Availability for helping, teaching, and assisting both medical staff and patients

Appendix B

Table B.1.

Content Analysis for the formulation of the online questionnaire

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
Is it a Known Concept?	The limited knowledge of clinicians about telemedicine seems to have influenced their perceptions of the technology (Ayatollahi, Sarabi and Langarizadeh, 2015)	The results showed that most of the clinicians (96.1 percent) had little knowledge about telemedicine. They perceived the advantages of telemedicine at a moderate level and its disadvantages at a low level.	To collect data, a five-point Likert-scale questionnaire was designed based on the literature review. The scale ranged from very high (5) to very low (1)	"Está familiarizado com o termo "Telemedicina"? Method : Likert Scale 1-5 (nada familiarizado → Muito familiarizado)	"Está familiarizado com o termo "Telemedicina"? Method : Likert Scale 1-5 (nada familiarizado → Muito familiarizado)
Are they a common practice?	There was a raise of from January 2017 (2324 consultations) to January 2021 (29916 consultations)	Measure Unit: Nº de Consultas Source Data: SICA	Use of interactive, audio-visual and data communications collected in the presence of the patient. These are just public hospitals	"Já efetuou alguma consulta em regime de telemedicina?" Sim Não Não, mas gostaria de experimentar.	"Já efetuou alguma consulta em regime de telemedicina?" Sim Não Não, mas gostaria de experimentar.
Are they relevant in all specialties?	Is it satisfactory to all different specialties or only the ones that don't require physical observation?	To be answered in Dissertation	Online Survey being built	"Acha que a Telemedicina teria potencial na sua especialidade?	
Is there engagement / participation in Portugal?	Gain knowledge on the use of telemedicine	To be answered in the Dissertation	Online Survey being built	"Já participou em algum projeto de Telemedicina na sua instituição?"	"Já participou em algum projeto de Telemedicina na sua instituição?"

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
How are different experiences?	The result showed that 78% of the clinicians were satisfied with the telemedicine system. In free text responses 69% said that telemedicine allowed quicker diagnosis and treatment, 47% said poor internet connectivity was a significant obstacle in using the system, and 40% suggested improvement to the infrastructure including internet connection and electricity. (Indria, Ajlani and Fraser., 2020)	Mixed methodology approach with questionnaires and interviews in Indonesian as data collection methods. A purposive sampling technique was used. The "clinicians" in the context of this study were general practitioners, nurses, and midwives that were using telemedicine equipment in primary care centres in and around Makassar City.	To recruit participants for this study, invitation letters were sent to 46 primary health centres. However, only 39 primary health centres participated in this study. Survey- The questionnaire consisted of 12 questions to assess clinician's overall perception of using telemedicine. The last part consisted of three open-ended questions related to aspects of the service that they liked or disliked as well as suggestions for future improvements.	"Se respondeu sim, como foi a sua experiência?" Muito má → 5 – Excelente Qualidade da Chamada Facilidade de diagnóstico Facilidade de uso da plataforma Facilidade de comunicação entre médico-paciente	"Se respondeu sim, como foi a sua experiência?" Muito má → 5 – Excelente Qualidade da Chamada Facilidade de diagnóstico Facilidade de uso da plataforma Facilidade de comunicação entre médico-paciente
Is it helpful for patients?	To identify the factors clinicians like most on patient benefits	Lower costs, improved acess of care, preventive care, convenience, slowing spread of infection (Villines, 2020) Better patient-doctor relationship Less travel costs Equity in access of care (Indria, Ajlani and Fraser.,2020)	Likert scale survey described in line 1	"Concorda que a telemedicina seria benéfica para os Utentes em" Melhoria na relação entre médico- paciente Redução tempo viagem e custos associados acesso a cuidados e saúde mais fácil	"Concorda que a telemedicina seria benéfica para os Utentes em" Melhoria na relação entre médico- paciente Redução tempo viagem e custos associados acesso a cuidados e saúde mais fácil conveniência de poder avaliar o meu estado de saúde

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
				conveniência de poder avaliar o meu estado de saúde independentemente da minha localização - eliminação do risco de infeções nosocomiais (provenientes dos hospitais)	independentemente da minha localização - eliminação do risco de infeções nosocomiais (provenientes dos hospitais)
Is it harmful to patients?	To identify the factors known to be of disadvantage to the patients	Insurance coverage protecting medical data care delays (Villines, 2020)	Peer-reviewed studies, academic research institutions, and medical journals and associations.	"Concorda que a telemedicina seria prejudicial para os Utentes em:" Cobertura pelo seguro de Saúde Proteção de dados médicos Atrasos no cuidado de saúde (exemplo necessidade de cuidados urgentes) Falta de recursos em casa para poder fazer uma consulta em regime de telemedicina	"Concorda que a telemedicina seria prejudicial para os Utentes em:" Cobertura pelo seguro de Saúde Proteção de dados médicos Atrasos no cuidado de saúde (exemplo necessidade de cuidados urgentes) Falta de recursos em casa para poder fazer uma consulta em regime de telemedicina
Is it helpful to Clinicians?	To identify the factors known to be of advantage to the Clinicians	- additional revenue stream, - less exposure to illness and infection - patient satisfaction, - Reduced overhead expenses (Villines, 2020) Clinicians' perspective • Diagnosis and treatment faster -69%	peer-reviewed studies, academic research institutions, and medical journals and associations.	Concorda que a telemedicina seria benéfica para os Profissionais de Saúde em:" - fluxo adicional de receita (trata mais pacientes em menos tempo) - menor exposição a doenças e infeções - maior satisfação do paciente,	

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
		• Reduce referrals -3% • Increase patient's trust -9% • Improve skill and coordination -4% • Easy to use - 13%		- Redução das despesas gerais - Rapidez de diagnostico e tratamento - Facilidade na monitorização de pacientes	
Is it harmful to Clinicians?	To identify the factors known to be of disadvantage to the Clinicians	Disadvantages for healthcare providers: - licencing issues, - - Technological Concerns - inability to examine patients (Villines, 2020) - Increase in the number of tasks - Increase in time used to do tasks (Indria, Ajlani and Fraser.,2020)	peer-reviewed studies, academic research institutions, and medical journals and associations. Surveys and interviews described above in row 1	"Concorda que a telemedicina seria prejudicial para os profissionais de Saúde em:" Aumento na quantidade de tarefas Aumento no tempo utilizado para fazer tarefas Inabilidade para examinar pacientes Preocupações tecnológicas (qualidade infraestrutura e conectividade)	
What are the obstacles in adhesion?	To understand all the major areas affected that can be improved by the use of telemedicine, and what can be done to make telemedicine more appealing to use	Zanaboni and Wootton noted that advantages for users, such as ease of use and incentives, are the crucial determinant when designing an effective telemedicine system.36 Rho et al. showed that perceived ease of use affected perceived usefulness and respondents'	Surveys and interviews described above in row 1	"Na sua opinião, quais seriam os fatores de maior influência na adesão a telemedicina?" Facilidade de uso Claridade na informação Qualidade dos recursos técnicos (conectividade - internet e computadores/tablets)	

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
		intention to use the technology. the security of telemedicine technology should be considered at a high level. operational processes, such as maintaining the confidentiality of patient information and documentation, are the most important factors to establish a secure network for telemedicine (Ayatollahi, Sarabi and Langarizadeh,2015) Suggestion Improve infrastructure -40% • Improve service quality -34% • Periodical training - 16% • Increase funding – 10% (Indria, Ajlani and Fraser.,2020)		Segurança da tecnologia (confidencialidade nos dados) Formação e treino Disponibilização de ajuda técnica Recursos financeiros	
What can be done to make it a more regular use?	This study aimed to evaluate clinicians' perspectives on providing clinical care via telerehabilitation during the early implementation of a novel	Confidence in providing treatment via telerehabilitation significantly improved with time Clinicians became significantly more accepting of	This study used a repeated-measures design. Surveys were conducted at four separate time points over a six-month period:	"Aumentaria o seu uso da Telemedicina se as condições anteriormente constatadas fossem correspondidas?"	

Research Question	Dimensions in literature	Is the Information answered in the article?	What did they ask?	Question for clinicians	Question for Patients
	spinal telerehabilitation service (Cottrell et al., 2018)	telerehabilitation being a time- and cost-effective platform in which they could deliver care. Overall satisfaction was high, with technology becoming easier to use and ability to establish rapport significantly improved with experience	Eight clinicians were recruited, completing surveys at four separate time points. The surveys consisted of the following domains: demographics, technology experience, knowledge & confidence, acceptance, and satisfaction with using telerehabilitation in clinical service delivery.	1 – improvável → 5 – Extremamente provável	
Is there a future post pandemic of Telemedicine? Will it be further used?	To create a representative idea of clinicians' future use of telemedicine	Despite the clinicians' limited knowledge of telemedicine, a majority of them thought that the use of this technology is necessary. other studies show which clinicians have reported the necessity of using telemedicine (Ayatollahi, Sarabi and Langarizadeh, 2015)	Surveys and interviews described above in row 1	"Acha que a Telemedicina na sua área será útil no futuro, se bem implementada?" 1 – improvável → 5 – Extremamente provável	

Appendix C

Figure C.1.
Distributed Online questionnaire

Estudo Impacto da Telemedicina

Obrigada por ter aceitado participar neste estudo. Este questionário é feito no âmbito do mestrado de Gestão de Empresas e é sobre o tema " A utilização da telemedicina por pacientes e técnicos de saúde". O questionário é anónimo e toda a informação partilhada neste questionário será confidencial.

*Obrigatório

1. Qual a sua familiaridade com o uso das novas tecnologias? *

Marcar apenas uma oval por linha.

	Nunca uso	Raramente uso	Por vezes uso	Uso frequentemente
Chamadas áudio	◯	◯	◯	◯
Videochamadas	◯	◯	◯	◯
Videoconferências / Webinars	◯	◯	◯	◯
Internet	◯	◯	◯	◯
Redes Sociais	◯	◯	◯	◯

2. Sexo *

Marcar apenas uma oval.

- ◯ Feminino
- ◯ Masculino
- ◯ Prefiro não dizer
- ◯ Outro

3. Qual a sua idade? *

Appendix D

Table D.1.

Rotated Component Matrix Resulting from SPSS Analysis of data

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
P34- Sinto-me confortável em adotar a telemedicina no futuro	**.912**	.125	.100	.065	.027
P33- Tenho uma posição favorável no que toca à utilização do serviço de telemedicina.	**.815**	.230	.237	.168	-.097
P31- No geral, confio no serviço médico prestado pela telemedicina	**.806**	.078	.124	.290	.140
P32- Sinto-me confortável em comunicar com o meu médico/paciente ao usar o sistema de telemedicina	**.803**	.305	-.032	.188	.202
P35- A telemedicina é uma forma aceitável de prestar serviços de saúde	**.779**	.058	.202	.088	.299
P29- Senti que era capaz de me expressar eficazmente	**.769**	.174	-.045	.174	.322
P36- No geral, estou satisfeito com este sistema de telemedicina	**.638**	.164	.298	.193	.424
P16- Foi fácil aprender a utilizar o sistema	.140	**.855**	.309	-.033	.032
P15- É simples utilizar este sistema	.091	**.831**	.278	.161	.151
P24- O sistema é simples e fácil de entender	.182	**.802**	.092	.261	.190
P18- Acredito que posso poupar tempo ao utilizar este sistema	.271	**.533**	.109	.170	.348
P17- É fácil realizar a minha consulta ao utilizar este sistema	.305	**.526**	.163	.229	.490
P13- Sou bom a utilizar os sistemas de telemedicina	.179	.227	**.843**	.212	.099
P14- Sou capaz de utilizar o sistema de telemedicina corretamente.	.126	.329	**.840**	-.026	.112
P12- Tenho experiência vasta no uso destes sistemas.	.095	.122	**.785**	.125	.096
P11- Sou capaz de utilizar os sistemas para o serviço de telemedicina.	.208	.497	**.504**	-.399	.163
P25- Este sistema responde a tudo o que eu gostaria que fizesse	.122	.234	.249	**.798**	.214
P30- Considero que as consultas fornecidas em telemedicina são iguais às visitas presenciais	.440	-.122	.095	**.719**	.048
P27- Eu consegui ver o meu médico/paciente como se nos contactássemos pessoalmente	.216	.244	-.246	**.632**	.275
P23- Gosto de usar o sistema	.434	.386	.274	**.621**	.172
P22- A forma como interajo o sistema é agradável	.224	.490	.230	**.515**	.275

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
P26- Eu pude facilmente falar com o meu médico/paciente	.103	.214	.223	.231	**.805**
P28- Eu consegui ouvir o médico/paciente claramente	.352	.201	.048	.141	**.730**
Eigenvalue Factor Analysis	10.255	2.899	1.900	1.415	1.029
Percentage of Variance Factor Analysis	44.588	12.602	8.261	6.154	4.475

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a] Rotation converged in 6 iterations

From this table we can infer 5 different factors, with the first one being the most inclusive, and the last one being the least inclusive. The identified factors were then renamed and tested for their reliability, according to their included dimensions and Cronbach Alpha Coefficient, respectively, as represented on table 2.2.3.3. As our population volume is reduced, these results do not yield enough weight to discard our primary model.

Table D.2.
Classification of the identified factors

Factor	*Dimensions*	*Question number*	*Factor Designation*	*Cronbach Alpha Coefficient*
1	Trust Satisfaction Acceptance Quality of telemedicine Interaction	31 32-34 35-36 29	Acceptance and Future use	$\alpha = 0{,}938$
2	Easiness of Use Quality of telemedicine Interface	15-19 24	Easiness of Use	$\alpha = 0{,}882$
3	Self-Efficacy	11-15	Self-Efficacy	$\alpha = 0{,}820$
4	Quality interface Quality of telemedicine Interaction Overall Quality	22,23,25 27 30	Quality	$\alpha = 0{,}848$
5	Quality of telemedicine interaction	26-28	Communication	$\alpha = 0{,}781$

From our reliability analysis, we can see that all values pertain at least 0,8 score, being considered of good reliability.

Appendix E

Table E.1.
SPSS Correlation table

Correlations

		Qual a sua idade?	Habilitações literárias	Self-efficacy	Easiness_of_use	Usefulness	Quality interface	Quality interaction	Trust	Satisfaction	Acceptance
Qual a sua idade?	Pearson Correlation	--									
	N	80									
Habilitações literárias	Pearson Correlation	**-.243***	--								
	Sig. (2-tailed)	.030									
	N	80	80								
Self_efficacy	Pearson Correlation	-.180	.102	--							
	Sig. (2-tailed)	.110	.366								
	N	80	80	80							
Easiness_of_use	Pearson Correlation	**-.271***	-.014	**.561****	--						
	Sig. (2-tailed)	.015	.904	<.001							
	N	80	80	80	80						
Usefulness	Pearson Correlation	-.158	-.097	**.428****	**.587****	--					
	Sig. (2-tailed)	.160	.390	<.001	<.001						
	N	80	80	80	80	80					
Quality_interface	Pearson Correlation	**-.383****	.068	**.462****	**.691****	**.630****	--				
	Sig. (2-tailed)	<.001	.551	<.001	<.001	<.001					
	N	80	80	80	80	80	80				
Quality_interaction	Pearson Correlation	**-.263***	-.026	**.264***	**.492****	**.626****	**.678****	--			
	Sig. (2-tailed)	.018	.820	.018	<.001	<.001	<.001				
	N	80	80	80	80	80	80	80			
Trust	Pearson Correlation	-.190	.065	**.293****	**.414****	**.667****	**.486****	**.656****	--		
	Sig. (2-tailed)	.091	.570	.008	<.001	<.001	<.001	<.001			
	N	80	80	80	80	80	80	80	80		
Satisfaction	Pearson Correlation	-.086	.070	**.357****	**.466****	**.610****	**.514****	**.650****	**.783****	--	
	Sig. (2-tailed)	.447	.536	.001	<.001	<.001	<.001	<.001	<.001		
	N	80	80	80	80	80	80	80	80	80	
Acceptance	Pearson Correlation	-.173	.063	**.402****	**.521****	**.715****	**.560****	**.551****	**.719****	**.737****	--
	Sig. (2-tailed)	.125	.581	<.001	<.001	<.001	<.001	<.001	<.001	<.001	
	N	80	80	80	80	80	80	80	80	80	80

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Appendix F

Table F.1.
SPSS T-test table

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance		Mean	Std. Error	95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Difference	Difference	Lower	Upper
Self_efficacy	Equal variances assumed	1.937	.168	-.606	78	.273	.546	-.08667	.14292	-.37119	.19786
	Equal variances not assumed			-.606	61.164	.273	.547	-.08667	.14294	-.37248	.19915
Easiness_of_use	Equal variances assumed	.006	.937	-3.241	78	<.001	.002	-.43667	.13473	-.70489	-.16844
	Equal variances not assumed			-3.068	51.224	.002	.003	-.43667	.14233	-.72237	-.15096
Usefulness	Equal variances assumed	3.338	.072	-3.519	78	<.001	<.001	-.60027	.17060	-.93991	-.26062
	Equal variances not assumed			-3.177	44.066	.001	.003	-.60027	.18893	-.98102	-.21951
Quality_interface	Equal variances assumed	1.970	.164	-2.445	78	.008	.017	-.37667	.15406	-.68338	-.06996
	Equal variances not assumed			-2.340	53.099	.012	.023	-.37667	.16097	-.69951	-.05382
Quality_interaction	Equal variances assumed	1.151	.287	-2.816	78	.003	.006	-.41733	.14818	-.71234	-.12232

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance		Mean	Std. Error	95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Difference	Difference	Lower	Upper
	Equal variances not assumed			-2.708	53.941	.005	.009	-.41733	.15409	-.72626	-.10840
Trust	Equal variances assumed	.492	.485	-.821	78	.207	.414	-.16000	.19484	-.54790	.22790
	Equal variances not assumed			-.790	54.106	.216	.433	-.16000	.20241	-.56579	.24579
Satisfaction	Equal variances assumed	.069	.793	-1.858	78	.033	.067	-.3113	.1676	-.6450	.0223
	Equal variances not assumed			-1.832	58.564	.036	.072	-.3113	.1699	-.6514	.0287
Acceptance	Equal variances assumed	.912	.342	-1.347	78	.091	.182	-.21667	.16086	-.53691	.10357
	Equal variances not assumed			-1.271	50.749	.105	.209	-.21667	.17042	-.55883	.12550