

Technology Acceptance in Health: eHealth – the perspective of clinicians

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Abstract Technology has been introduced in the various fields of healthcare. In this dissertation, the goals will be to study the current state of eHealth in the Nacional Health System (NHS), which variables influence its acceptance by the healthcare professionals and how one can improve said acceptance. That information was acquired using two methods: individual interviews to both experienced specialists and policy deciders in this area to evaluate which topics would be further explored; Internet survey targeting all the physicians and nurses in the NHS. Then, through Principal Component Analysis and linear regression, one attempted to first identify and then correlate the different variables. Survey results from 151 respondents indicated their perception of: the greatest obstacle to be “Insufficient technological media in the workplace”; the greatest benefit for both themselves and their patients to be the reduction of the number of travels to and from the healthcare institutions; the greatest incentive to be “Incentives for the institutions to acquire telemedicine equipment”; a clear disagreement regarding the adequacy of the strategy for telemedicine in the NHS. An attempt was made to understand the underlying variables and they were built with good correlation between the items that were grouped together to explain them but with low correlations when compared to each other. The main recommendations that stem from this study are the clarification of the strategy for telemedicine to the healthcare professionals in the NHS and an investment in equipment acquisition to build on top of the professionals’ positive attitude towards telemedicine.

Keywords: eHealth, linear regression, Principal Component Analysis, technology acceptance, technology in healthcare, telemedicine

I. INTRODUCTION

THE definition of health has evolved through time, with this evolution being linked primarily to the culture of the society that created it. Initially, it was merely seen as the absence of disease and had mostly one component – physical well-being – which was perceived as a “gift from the gods”. However, in these last centuries, due to the numerous scientific and cultural developments, there have been several updates to the health concept to encompass, not only physical well-being, but also psychological and social well-beings. Currently, the definition adopted by the World Health Organization (WHO) suggests health is “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 2006).

Just like the definition of health, the practice and purpose of medicine have evolved considerably, with that evolution being due to several factors. Firstly, it has, naturally, kept up with the many different definitions of the health concept. Secondly, that evolution was intimately connected to the

variations on the geographic distribution of the population, which were dependent on the various migrations throughout the centuries. Third and finally, one has to highlight the natural change in medicine thanks to scientific breakthroughs, which have allowed an improvement in the living conditions, the eradication of certain infectious diseases and the early detection of genetic abnormalities, thus contributing to a positive evolution of numerous indicators, with the most noticeable being the average life expectancy at birth that, in Portugal, underwent a significant increase from the 71.78 years in 1980 to the 79.20 years in 2010 (George, 2012).

These three aspects suggest a series of challenges countries have to deal with nowadays. This is where eHealth enters, as a way to practice healthcare remotely, i.e., without the need for the caregiver and the patient in the same room. It has had a tremendous evolution recently thanks to the improvements of the Information and Communications Technologies (ICT), such as cellphones, computers and Internet, and has broadened its spectrum, no longer being confined to remote diagnosis and education and partaking now in previously inaccessible areas, such as treatment and prevention. Due to the huge scope of eHealth, there are numerous definitions for this concept, but the closest one officially acknowledged by the WHO is related to telemedicine and states that telemedicine is “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, all in the interests of advancing the health of individuals and their communities” (WHO Group Consultation on Health Telematics, 1998).

Nowadays, with technologies in health being used, not only for the practice of medicine, but also for other purposes such as nursing and even patient education, several authors have abandoned this term to adopt new ones, such as e-Health. eHealth is meant to have a broader scope and refer to every specialty in healthcare and not just the physicians themselves, as telemedicine suggests, even if recent studies have shown that the two terms are being used interchangeably and in a somewhat ambiguous way (Fatehi & Wootton, 2012). However, since this study will be applied to the Portuguese healthcare system, it was decided the most suitable definition to use throughout the main text of this dissertation and in every interaction with healthcare professionals would be telemedicine, as it is the one used by the Portuguese entities dealing with this subject.

Telemedicine is thus a complementary way of practicing medicine and improving population health and has various uses in the different areas of healthcare, such as diagnosis and prevention, for example. In diagnosis, there are recent studies showing telemedicine can reduce in 80% the need of face-to-face consultation on diabetic retinopathy diagnosis, with most of the required consultations being due to the insufficient definition of the image obtained (Mansberger et al., 2013). Shifting the focus to prevention, telemonitoring has been considered fundamental to follow patients with chronic diseases such as chronic obstructive pulmonary disease (COPD) and heart failure, having the potential to reduce not only the associated mortality rates but also the number of hospital admissions (Grupo de Trabalho de Telemedicina, 2015; Kotb, Cameron, Hsieh, & Wells, 2015).

Portugal has sought to keep up with the progress of developed countries in this area and has developed several initiatives for the introduction and improvement of health programs in Portugal, in areas as diverse as telemonitoring of COPD or teledermatologic screening (Grupo de Trabalho de Telemedicina, 2015). In order to promote telemedicine acceptance, there have been some objective measures in Portugal. The first one, created in 2013, states that, for every teleconsultation, regardless of being first or subsequent and programmed or emergent, hospitals are paid ten percent extra than the equivalent face-to-face consultation (Administração Central do Sistema de Saúde, 2016). The second was the creation, in 2015, of the Telemedicine Internal Promotor, who is someone appointed by the institution where they work and whose main goal is to promote the implementation, mostly on the clinical point

of view, of telemedicine at their workplace. The third main measure was the signing, in 2015, of a framework agreement to facilitate and potentiate the acquisition of telemedicine services by the different country regions and islands, with its main focus being telemonitoring and teleconsultation services (Grupo de Trabalho de Telemedicina, 2015).

As one can observe, there are several advantages of telemedicine but there are still a number of obstacles which contribute to telemedicine not living up to its full potential. To understand them, one should realize that “the task for every health care system is how to maximize the personal contact at the same time as maximizing the technical input, while all the time operating within a sustainable financial framework” (Wootton, Patil, Scott, & Ho, 2009). From this sentence, one can highlight several points of view one should take into account to study the integration of telemedicine in a national health system: how to do it to guarantee one obtains the necessary information for the patients’ well-being; how to do it without damaging the relationship between healthcare professionals and patients and without disrespecting the rights from both sides; how to do so with a dwindling amount of resources in the current context of demographic aging and international economic crisis. These factors end up significantly influencing the acceptance, by the clinics, of telemedicine, which has been often suggested as the main variable for the successful implementation, expansion and sustainability of this service in the national health systems (Wade, Elliott, & Hiller, 2014).

The study of the acceptance of new technologies is a particular application of a broader field, the study of the attitude of an individual towards a particular task. In 1975, Martin Fishbein and Icek Ajzen proposed the Theory of Reasoned Action (TRA), having initially isolated and identified four major variables – belief, attitude, intention and behavior – and then sought to study them more in depth (Fishbein & Ajzen, 1975). After this more thorough study of the variables, they then suggested, not only that they could be objectively analyzed and measured through probabilistic models, but also that they were interrelated, with beliefs resulting in attitudes, attitudes leading to the formulation of intentions and intentions leading to behaviors, which can, in turn, lead to new beliefs due to the fact that its realization allows the acquisition of new information, the main determinant of the formation of a belief. Ajzen later updated this theory to create the more general Theory of Planned Behavior (TPB).

Parallel to this development, other authors have studied and adapted TRA to other contexts, with the most relevant proposal for the topic in question being the Technology Acceptance Model (TAM), created to study behaviors related to the usage of information systems (Davis, Bagozzi, & Warshaw, 1989).

These different theories have been used to study ICT

adoption in many areas and healthcare is no exception, although the studies in this area have been mainly focused on the use of electronic databases and digital libraries (Gagnon et al., 2009) and that is what this study aims to mitigate.

Telemedicine acceptance, however, is too broad of a topic to study on its own. This study will have three main goals: understand what the opinion of the healthcare professionals on telemedicine is; study which variables influence, both positively and negatively, the acceptance of telemedicine and their relative importance to the professionals; how to increase the acceptance and further adoption of telemedicine, which will hopefully produce practical and concrete suggestions.

This information will be gathered using mainly two methods, with the first being the individual interview which is a qualitative method whose main purpose will be to provide a better context for the following method, which is the Internet survey, targeting a larger sample to attempt to get enough data to analyze and draw conclusions from.

II. METHODS

A. *Individual interview*

Individual interview, despite not being the staple method of qualitative research, was chosen because it allows the creation of a greater bond and, therefore, more trust between the interviewer and the interviewee, which allows the discussion of more personal topics, which the interviewee might have felt uncomfortable discussing in public. That is particularly important in some of the aspects one will approach further on, such as the interviewee's perception of others' opinions or his perception of the boss's opinion on this topic. Besides this extremely relevant benefit, individual interviews also help dealing with some of the constraints strongly related to the professional classes in analysis, such as: hectic schedules, because these busy professionals can barely accommodate one short interview, let alone a focus group; heterogeneity, because, when organizing a group method such as focus groups or group interviews, the best information stems from discussion between more similar persons, since the participants need to feel comfortable with each other, which is something particularly difficult to achieve considering the above constraints (Gibbs, 1997); interviewer reflection, by excluding every other task and any other interaction other than with the interviewer, the interviewee has time to ponder each question as long as they want, which will hopefully lead to more complete answers and a better understanding of his stance on the matter he is being questioned about (Birks & Malhotra, 2006).

Before selecting the interviewees, one should pick the common characteristic they should all have (Merton, 1990). In this case, the chosen characteristic was experience with telemedicine: it was decided that every interviewee should have been involved in a telemedicine program in his

professional career.

Acknowledging that it would be interesting to hear from both professionals involved in the important decisions regarding telemedicine and the specialists using it in their daily routine, and in an attempt to mitigate their downsides, it was decided the desirable sample of ten professionals would be a mix of professionals more involved in policy discussion and professionals working with telemedicine in their daily routine.

Concerning the structure of the method, the general interview guide approach was chosen for three main reasons: it encourages a more informal conversation, while still ensuring every relevant topic to the interviewer is discussed; it allows the interviewer to reword the previously prepared questions according to the interviewee's answers to previous questions and thus creates a more personal context; it allows some flexibility between interviews, not demanding the same approach for all of them and allowing the interviewer to tailor the guide to the interviewee (Turner III, 2010).

The interview had a total of 15 questions, the maximum number of questions considered recommended for such a method (Boyce & Neale, 2006). They allowed to gauge the interviewee's perspective on telemedicine as a concept, his experience with it, his opinion about the specific tools and their benefits they bring, the future of telemedicine in their specialty, his bosses' opinion on the topic and, last but not least, his opinion on the greatest obstacle for telemedicine acceptance in Portugal. Since the method allowed some flexibility, there were some adaptations to the interview guide to extract more information from each interviewee.

B. *Internet survey*

The first decision to be made in this section was who to target. There were some discussions about whether to include professionals such as pharmacists and healthcare technicians, but the longer execution period, generalization of the approach needed for that and the previously mentioned studies regarding clinician acceptance being the most important factor for telemedicine acceptance (Wade et al., 2014) ended up restricting the final targets to physicians and nurses.

There are two main types of quantitative methods: observations and surveys. When considering using observations to study healthcare-related questions, there are limitations, such as scheduling issues due to very unique working periods and the ethical concerns regarding patients' privacy. Moreover, for this stage of the research, the goal was to get to more professionals, which means it would be impractical to conduct dozens of observations with a single researcher, while still meeting the deadlines of this dissertation. Those limitations led to the chosen method for this stage of the research being the survey. When deciding which type of survey was going to be performed, factors such as restricted access to possible respondents' contacts, short time of administration, geographic range, perception

of anonymity and costs ended up leading towards the use of Internet platforms as the mode of administration.

When designing the questionnaire, there were two concrete limitations transmitted by the interviewees during the interviews stage that were considered throughout the process: healthcare professionals are bombarded with questionnaires and they tend to bypass them unless they identify with the cause; healthcare professionals are extremely busy and have very reduced available time and thus the desirable average time length for such an activity is around five minutes.

The questionnaire had a total of 24 questions, with 5 of them being for sample characterization purposes. They focused primarily on the questions whose responses seemed more relevant during the interviews, with a particular focus on the importance of the potential barriers to telemedicine acceptance, the benefits telemedicine can bring to patients, the importance of several characteristics of apps for their use in clinical settings, the importance of several incentives, both for the clinician and for the institution they work for, and the possible benefits for the clinicians themselves.

To measure each of these questions, a five-point Likert scale was used, without any change in polarization or randomizing of the questions, to avoid increasing the average response time and thus alienating the respondents.

To distribute the questionnaires and reach the maximum number of potential respondents, there were two types of approaches used: the first one targeted the author's personal contacts, while the second one targeted every public hospital, Regional Health Association (RHA), and even a few healthcare centers of the NHS and research facilities in Portugal. In total, the study will work with data from five collaborations with hospitals and one with a RHA, as well as the occasional response from the individual approaches.

III. RESULTS AND DISCUSSION

A. Individual interview

As one might imagine, a total of ten interviews with specialists with plenty of experience in telemedicine and policy deciders with years of decision making in this area generated too much information to display in this article. As such, only a portion of it will be presented, with a focus on the benefits, the future of telemedicine, incentives and obstacles.

The first topic to be addressed is the definition and the responses ranged from the textbook ones to deeper ones approaching topics such as the necessity, or absence of it, of technology, as well as the changes it introduces in the patient-clinician relationship. The scope of the term was actually one of the most debated topics in the entire interview guide, with some of the arguments resembling the ones discussed in the Introduction of this article. Regarding the frequency of use, the most mentioned one was daily, with one specialist reporting a weekly use, as part of the current national teledermatology project.

Regarding the question about the main benefits of telemedicine in the interviewee's area, it was an important topic to delve into as it allowed the author to understand first-handedly if the reported benefits studied and discussed were also being praised or even perceived as such in the Portuguese reality. The results can be seen in Table I and, as expected, among the most highlighted benefits were the reduction of time, both in scheduling the procedures and in the actual travels to the institutions, and money, both for the patients and the institutions.

TABLE I
Most discussed benefits of telemedicine

Benefit	Prevalence
Reduction of time spent by patients to access healthcare	7
Consulting with other clinicians to improve knowledge on specific diseases	4
Improved monitoring of the patients	4
Reduction of money spent by patients to access healthcare	4
Reduction of waiting list in healthcare facilities	3

When the interviews shifted to apps, the responses went from the complete and utter rejection to the enthusiast acceptance and even admittance of an already existing daily use. The most common concern about apps can be summed in "If the app is not certified in a way that tells me the data it provides is credible and I can act upon it, I do not have any interest in it." (Manuel Lopes, personal communication, July 6, 2016) There were further discussions about this certification, with conversations about the future European model for the regulation of this sector on top of the table.

About the potential of telemedicine, there was somewhat of a polarization of the opinions of the interviewees with specialists being extremely optimistic, while most of the policy deciders were mostly hesitant and stating the need for a change of paradigm in the NHS because "As long as you tolerate that a person can go home during a month and no one calls her, no one contacts her, because she will eventually return there physically, no one will actively attempt to contact her." (Henrique Martins, personal communication, July 29, 2016)

Incentives ended up bringing one of the very positive signs of this stage of the research with the funding of equipment acquisition being the most referred one, above all personal financial incentives. The entry barrier for this field is an extremely pressing issue and, for three of the specialists in this sample, it was the greatest way to promote telemedicine as the price of the required equipment to start pilot-projects has often been their doom.

The last question of the general interview guide was, without a doubt, the most anticipated one with the discussion of the obstacles bringing the results in Table II.

TABLE II
Most discussed obstacles to telemedicine acceptance

Obstacle	Prevalence
Ignorance from the clinicians about the benefits of telemedicine	4
Lack of interest / conflicting interest regarding this area	4
Drastic changes to the current workflow	3
Inadequate information systems	3
Lack of an adequate strategy to support telemedicine	3

As surprising as it may seem, the main two factors referred during this stage were not directly linked to any technical or financial aspect and were instead linked to the clinicians' thoughts and feelings towards telemedicine. Despite not being significant due to the small sample being analyzed here, the psychological aspect as the main barrier to telemedicine acceptance was also hinted by other authors analyzing, for example, the success of the implementation of telemedicine services in Australia (Wade et al., 2014).

The first of those factors is ignorance about the benefits of telemedicine, which is an issue that has been acknowledged by the Telemedicine Workgroup with the dissemination of information to both the clinicians and the general population being among the planned measures to increase telemedicine acceptance over the next few years.

The second factor consists of two different obstacles being grouped together because they are ultimately tied to the same underlying cause: perception of utility. One topic was particularly in evidence in this discussion and that topic was the feeling that telemedicine might lead to the end of face-to-face consultations, which have been the main clinical act for centuries.

The last obstacle on the table was explicitly mentioned by three interviewees and that is the reason for the accounted prevalence there but, if one were to include every indirect mention of it, it would have been the most prevalent obstacle in this sample of interviewees. The lack of strategy encompassed two main paradigms. Regarding local strategy, the main issues are the lack of communication between hospitals' administrative councils and the departments' teams problems with organization due to the required support structure on a team to accommodate the extra work telemedicine brings. When it comes to national strategy, the criticism is different with the lack of a neutral, politically-independent entity able to provide a more solid source of knowledge and therefore safety and trust on the subject being appointed as one of the main causes because, even

though most healthcare professionals agree telemedicine is indeed a positive thing, this strategy cannot be created within a four-years period, the duration of a government mandate in Portugal.

B. Internet survey

Before analyzing the results of the Internet survey, one should first take a look at the sample. The number of healthcare professionals in each class that responded to the survey can be seen in Table III.

TABLE III
Number of responses per professional class

Professional class	Number of responses
Physician	115
Nurse	22
	137

There were a total of 151 responses, with 137 complete ones. Out of those, the vast majority came from physicians, which means the discussions and further conclusions will naturally be more geared towards them. To provide some context, the number of responses obtained is only a fraction of the total number of physicians and nurses working in Portugal, which is, according to the latest stats, 65721 (Serviço Nacional de Saúde & Administração Central do Sistema de Saúde, 2016).

The distribution of the 33 specialties represented in the sample is too big to be displayed and thus only the six most common can be consulted in Table IV.

TABLE IV
Six most mentioned specialties and their prevalence

Specialty	Number of respondents
Dermatology	6
General Practice	38
Gynecology	6
Internal Medicine	15
Neurology	6
Pediatrics	8

General Practice and Internal Medicine are the two most common specialties, which is only natural if one considers those are the two specialties with the greatest number of physicians in the NHS (Serviço Nacional de Saúde & Administração Central do Sistema de Saúde, 2016).

Now that there is some additional information on the sample, one can move on to the analysis of the questions themselves. Just as for the interviews stage, displaying the complete analysis performed would be unfeasible and therefore only the most relevant questions will be discussed.

The first thing to analyze is the attitude of the respondents towards telemedicine, which was overall

extremely positive, with a great interest being seen in Figure 1. This mentality can give an idea of the willingness of the clinicians in the NHS to accept the further introduction of technology in their daily routine.

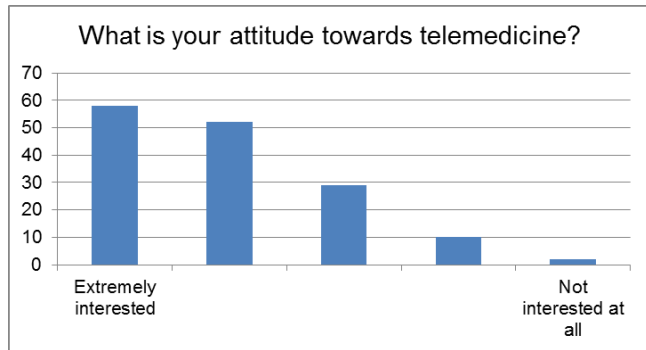


Figure 1 - Attitude towards telemedicine

The next question to analyze is the question related to the obstacles to telemedicine acceptance. Due to the big number of items, the display of the results would take over too much space if one were to identify each item in the plot. The items are displayed in Figure 2 following the same order as the one in Appendix 4 of the Dissertation that accompanies this article. Looking at the plot, one cannot overlook the great deal of importance attributed to items 4 and 5, corresponding to “Insufficient technological media in the workplace” and “Lack of clarification of the clinician's accountability”, two items that are not directly related to telemedicine itself, but to the technical and administrative support it requires to function properly.

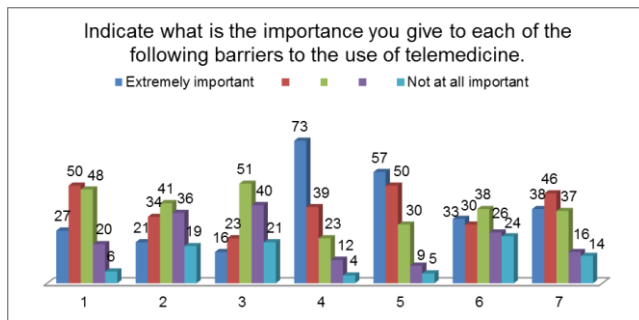


Figure 2 - Importance of the different barriers to the use of telemedicine

For the next question, the goal was to understand what were, in the clinicians' perspective, the most relevant benefits telemedicine could bring to their patients. The data can be consulted in Figure 3 and, once again, to allow a better display, item names were omitted and can be consulted in Appendix 4 of the Dissertation. From the analysis of the plot, there is one item that immediately stands out, which is “Reduction of time spent in travels to and from healthcare institutions”, with 91 respondents out of the 151 strongly agreeing with it and only a total of 11 respondents disagreeing this reduction is a benefit of telemedicine. Besides this item, two other items should be emphasized: “Reduction of total costs associated with

travels”, with 126 respondents agreeing patients save money in traveling to and from healthcare institutions thanks to telemedicine; “Reduction of the maximum response time in healthcare access”, with 115 respondents stating they think telemedicine can contribute to the shrinkage of waiting lists in healthcare. It is interesting to notice the three items the respondents agreed with the most are also the three most easily measurable, with respondents being more hesitant in considering more intangible topics when it comes to these benefits.

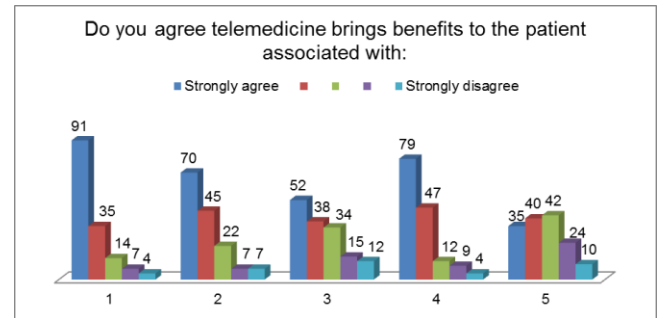


Figure 3 - Relevance of the patient benefits according to the respondents

Moving on, the respondents were asked if they had ever participated in a telemedicine project, with the goal being the evaluation of said projects and perhaps the influence that might have had in the respondents' attitude towards telemedicine. However, as one can see in Figure 4, the low number of participations invalidated any further analysis on this topic.

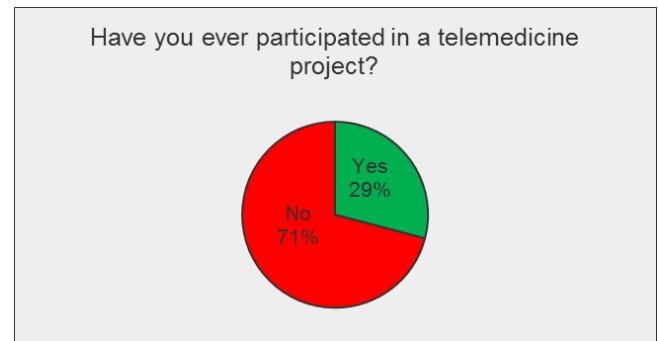


Figure 4 - Percentage of respondents with previous experience in telemedicine

The next question to analyze is related to the respondents' perception regarding the adequacy of the strategy of telemedicine in the NHS, which was one of the most mentioned obstacles during the interviews stage, as stated in Table II. The responses regarding this question can be consulted in Figure 5 and it confirms the tendency of the interviews, with a whopping 64 respondents out of the 143 manifesting their negative opinion towards the national strategy for telemedicine and only a total of 20 respondents reporting a perception of adequacy regarding it. When one considers the indication from the interviews and such a clear result from the survey, there are enough signals hinting at significant problems on the strategy for telemedicine in the

NHS and that those problems might be having an impact on how professionals face this subject.

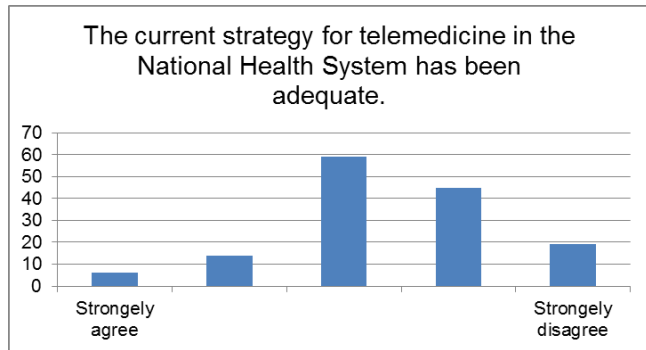


Figure 5 - Adequacy of the telemedicine strategy in the NHS

When discussing strategy, it is important not to overlook the incentives and that is exactly what the next question aims to study. Its purpose was to know which incentives were more important to the respondents and the results can be seen in Figure 6 (to check the items' names, please check Appendix 4 of the Dissertation that accompanies this article). "Incentives for the institutions to acquire telemedicine equipment" is the item that stands out the most, with 121 out of 143 respondents considering it important, which was to be expected as it was also the most referred incentive during the interviews stage since it allows the institutions to overcome the initial financial barrier and start with the telemedicine programs. The other curious information to extract from this question is the fact that "Financial incentives for the clinician" was considered the least important incentive, which might be another factor to look at as it is often the most referred incentive. It could be advisable to adjust the strategy for telemedicine in the NHS to give more importance to the other items instead.

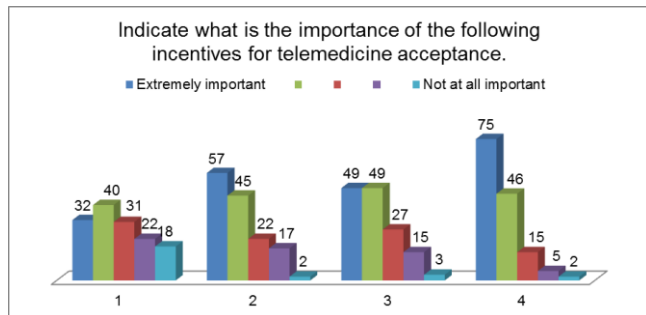


Figure 6 - Importance of the different incentives for telemedicine acceptance

Moving on, it is time to analyze how important each clinician benefit is to the respondents. The results are in Figure 7 and, before anything else, it is important to mention all the benefits had more respondents agreeing with their association with telemedicine than disagreeing with it, which shows, once again, the prior investigation in this topic was adequate to the reality in the NHS. The first item one should discuss is "Reduction of the number of travels" with a total of 117 out of the 143 respondents agreeing it is a benefit associated with the use of telemedicine. Also

noteworthy are the number of positive responses regarding items "Possibility of greater patient monitoring" and "Greater possibility of consulting on concrete clinical cases", two of the most mentioned benefits in conferences on telemedicine and, as a natural consequence, two of the most advertised topics. It is also important to notice the three most agreed upon benefits are the ones most closely related to the factual definition of the term telemedicine, with most of the others being either an increase in metrics, such as the "Productivity increase" or more intangible subjects, such as the "Strengthening of bonds between clinicians", which ended up being the item which attracted the least amount of attention in this question.

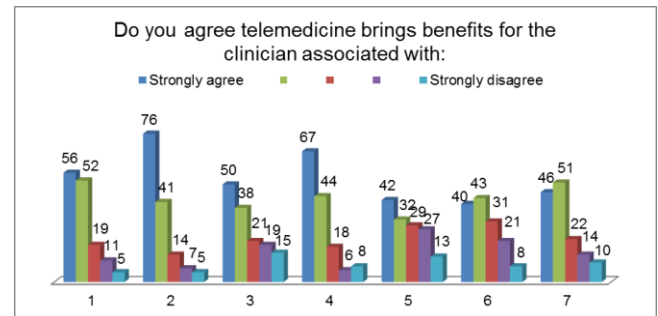


Figure 7 - Relevance of the clinician benefits according to the respondents

IV. CONCLUSIONS

The first point that needs to be emphasized is the eHealth vs telemedicine debate, which might seem like a paradox for anyone who reads the title and then the article itself. However, if one were to consider their pure definition, eHealth has a greater scope and focus on everything technology can do related to everyone involved in healthcare, while telemedicine focus on the physicians' part of the job. That is why, in the author's opinion, the term eHealth is the more fitting one for this dissertation's scope and that ended up being confirmed more than once during the realization of the interviews thanks to many discussions on this subject.

The second point one has to focus is that the bulk of the academic work on telemedicine focus on its technical aspects and their direct applications to healthcare and several examples of that can be found throughout the state of the art of this dissertation. That means other relevant aspects such as the study of the financial gains of its use are somewhat deprecated, which makes it that much harder to overlook the significant financial barriers concerning equipment acquisition since there is no specific evidence-based counter-argument for them. In addition to that, another relevant type of studies such as telemedicine acceptance ones are overlooked and there was not much to work on top of, something the author hopes to mitigate with this study.

Looking back at the study and all the information obtained, one will now take the analysis of trends in the

obtained data to suggest objective measures to increase telemedicine acceptance. In this topic, the first and perhaps most important suggestion stems from the identified distance between policy deciders and specialists on this subject during the interviews and the confirmation of that during the survey and it is the inadequacy of the strategy being used for telemedicine in the NHS. It was among the most identified obstacles during the interviews stage, as can be seen in Table II and it went on to be the question with the greatest number of negative responses of the survey, as seen in Figure 5. This does not mean there is no clearly defined strategy for the NHS and there are organizations doing relevant work on this and a few references to documents that support it throughout the dissertation, but it might mean that strategy is not being transmitted to the ones who have to execute it, thus giving the perspective of a lack of strategy. To reduce this feeling, there needs to be a greater communication between the more central decision-making groups and the clinicians.

Moving on to other suggestions, there is one measure which should be analyzed in greater detail and that is the investment in equipment for healthcare institutions, as that is the most important barrier for the acceptance of telemedicine according to the interviewees and the respondents of the survey. There are a few questions on the survey suggesting the respondents' mindset is favorable to the use of telemedicine and this might translate into the acceptance of telemedicine, should the main obstacles be dealt with first. There should also be a more intense propagation of the notion that patients are, indeed, interested in telemedicine. It is possible to see in Figure 2 and Figure 3 that respondents have a strong opinion regarding the impact of telemedicine in patient satisfaction with their services. Interviewees had a very different perception with some of them even mentioning that, once patients felt what telemedicine could add to their lives, they did not want to go back to the more traditional care. This could be done either through the use of feedback surveys to patients involved in telemedicine programs or through the dialog with patients associations to transmit to the clinicians their will to accept these technologies.

V. FUTURE WORK

This article attempted to explore one understudied topic of research: technology acceptance in health. It ended up providing some relevant information but it could not acquire a significant sample to further explore the trends noticed during the interviews. This means the first recommendation for future researches in this area is to perform a larger study targeted for these professionals and attempting to study the effects age and specialty have on the intention to use telemedicine. The larger sample should also allow the study of more conditional topics in greater detail, such as the success of telemedicine projects and how it influences the professionals' attitude towards telemedicine in general.

The second recommendation is to extend this study to the healthcare technicians as they are gaining an increasingly higher relevance in this process and having to learn how to deal with larger amounts of information, thus being an important part of the process of supporting physicians and nurses in accepting and using technology.

The third recommendation has to do with the financial impact of the introduction of technology in the NHS. There are barely any studies on this topic worldwide and the ones that do study costs and technology in health cannot meet the standards, not realizing basic analyses such as cost utility ones (Whitten et al., 2002). Despite cost reduction being a common argument to support telemedicine and eHealth in general, there is no scientific evidence that it happens, which means all the financial-related information policy deciders have at their disposal is the myriad of initial costs that comes with them, such as equipment acquisition, staff allocation and the temporary performance reduction during the adaptation period. There needs to be solid evidence that these technologies contribute to reduce costs in healthcare as that would be a valuable argument in this context of financial struggle worldwide.

The fourth and final recommendation of this study is to explore the issue surrounding the strategy for telemedicine in the NHS. It was perhaps the greatest problem this study identified and it showed most physicians and nurses which participated have a significantly different opinion regarding strategy from most of the policy deciders interviewed. This is particularly relevant when discussing an activity with substantial initial costs and temporary increases in workload for the professionals, two factors that can contribute to a reduction of actual use of these technologies.

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