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What do Portuguese patients think of their National Health System?

*A study on the expectations and satisfaction in the
Portuguese healthcare service*

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“To know even one life has breathed easier because you have lived. This is to have succeeded.” - Ralph Waldo Emerson

Abstract

This thesis takes upon the Healthcare industry with the main goal of understanding the opinion of Portuguese patients with the National Health System. Concretely, the study examines patient expectations and patient satisfaction within the Portuguese context through the use of online and offline surveys distributed to the population. Despite the use of a non-representative sample, with most of the respondents living in Coimbra, our findings indicate that participants expect a more functional health system, preferring a quick and efficient service focused on practicality. Participants in this research ranked their satisfaction with the National Health Service with a 13 out of 20, indicating possibly that they're not dissatisfied but they think that there's a lot of room for improvement. Relationship with their doctors, waiting time and hospital's environmental variables reported the lowest scores revealing that possibly an intervention is needed in these areas to improve patient satisfaction.

Esta tese baseia-se na indústria da saúde com o objetivo principal de perceber quais as opiniões dos utentes do Sistema Nacional de Saúde Português. Concretamente, o estudo examina as expectativas dos pacientes e a satisfação dos mesmos no contexto Português através do uso de entrevistas anónimas e questionários distribuídos à população via internet. Apesar do uso de uma amostra não representativa, com a maioria dos entrevistados a viverem em Coimbra, os resultados indicam que os participantes esperam um sistema de saúde mais funcional, preferindo um serviço rápido e eficiente focado nos aspetos práticos. Os participantes desta investigação avaliaram a sua satisfação com o Serviço Nacional de Saúde com um 13 numa escala de 1 a 20, indicando possivelmente que não estão insatisfeitos, mas que consideram que há muito para melhorar. Relação com os médicos, tempos de espera e variáveis referentes ao ambiente dentro do hospital tiveram as piores classificações, revelando que possivelmente uma intervenção é necessária nestas áreas para aumentar a satisfação dos utentes.

Preface

I've never really understood why my fellow colleagues took pictures of their thesis' delivery. It didn't made sense to me at all until I've passed through the process myself. After four challenging months, I've came to notice that this document represents more than just 13000 words on patient satisfaction with national health service in Portugal. At face value, it represents the end of 18 years of education and the beginning of, hopefully, a successful and exciting career in the field of management. It represents all the exams and presentations, homework and study marathons I've ever face in my academic life. It represents not only my work but the work of my family, friends, colleagues and teachers, who kept me in line and "lead me not in temptation". For that tremendous difficult task, I dedicate this thesis to them.

To my mother, for being my 24/7 emergency line and, honestly, the best mom the world has to offer. To my dad, for financing my education and teaching me a lot of good and bad things. To Marta, for being the rock and glue that holds me together. To my sister, to my aunt Paula and cousins, Virgilio and Hugo, for all the support and constant presence. To Nuno and Manuel, for providing empirical evidence that introverts can have friends and to Professor Kyryl, Susana Frazão Pinheiro and all Católica Lisbon staff, for the academic support and inspiration. Finally, to my grandfather Sebastião for all the inspiration and quality of life I am able to enjoy today.

Besides this, my thesis also represented the end of a tremendous, self-inflicted challenge. When I first decided on healthcare as the industry to focus on, I was looking to learn more about a field where managers are really put to the test, where profit problems cannot be solved by cutting costs or firing people, where declines in quality do not represent less sales but more deaths. This is the setting for the modern-day healthcare manager and it is a highly stressful one. How do you decrease costs and still improve quality? How do you expand your coverage without additional funds? My main goal was to learn more about it and to suggest an improvement to the Portuguese case, based on some sort of primitive empirical evidence, and I honestly think it was achieved.

In the end, it was interesting to realize that my dissertation process was just like reading the last pages of a mystery novel as I was equally stressed and eager to end it, but empty on the inside when it finished. Time to move on to another book, some would say, but before, here I stand with two CDs and two hard copies in one hand, smartphone on the other and Católica Lisbon on the background, ready to take my "thesis delivery picture".

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Introduction

Topic Introduction

Health, and the management of healthcare, has become one of the biggest challenges of the modern world. In developed countries, governments are faced with an expanding and older population, resulting essentially from life expectancy increases. Expenditures in the global healthcare industry are projected to reach 8.7 trillion dollars in 2020 whereas spending as a percentage of gross domestic product (GDP) should rise slightly, representing more than 10% of the total value created in a country (Deloitte, 2017). Thus, reforms in healthcare management are essential to increase efficiency and reduce costs, but governments and reformists should not forget that the main goal of healthcare is health itself. Reflections on how to solve this problem yielded a new interesting view. As Ash & Volpp state, in a comparison with the famous Kodak case-study, “whereas doctors and hospitals focus on producing healthcare, what people really want is health” (Ash & Volpp, 2012). Furthermore, the authors argue that “doctors and hospitals who pay attention to the business they are actually in — defined by the outcomes their “customers” seek — will leave the doctors and hospitals who don’t behind, captured in a Kodak moment” (Ash & Volpp, 2012). Similarly, in an attempt to propose a fix to the healthcare problem, Michael Porter argued that “we must move away from a supply-driven health care system organized around what physicians do and toward a patient-centered system organized around what patients need.” (Porter & Lee, 2013) suggesting a six steps value agenda that provides a “fundamentally new strategy”, one focused on “maximizing value for patients”. Overall, this paradigm shift towards “value-based systems” and “patient-centered care” lead many hospitals and governments to focus on satisfying patients and improving the healthcare experience. In a survey run in 2009 in the United States, over 90 percent of top-level hospital executives said that “enhancing patient experience is one of their top priorities” (Betts, et al., 2016). Since then, the literature on patient experience and patient satisfaction grew exponentially, providing a vast number of studies that allow hospitals and governments to better understand the patients and adapt the system to meet their expectations.

Despite this, the Portuguese setting is astonishingly different with discussions about the healthcare system being dominated by supply-side topics, with limited attention given to the demand-side of the health equation, the Portuguese patients. There’re reasons to believe that the opinions, expectations, and perceptions of Portuguese patients remain unknown for the government and hospital providers.

Problem Statement and Research Questions

Recognizing this problem, the main purpose of this thesis is to investigate the patient's opinion of the Portuguese healthcare system and provide feedback regarding the main expectations and satisfaction levels of Portuguese patients. Concretely, this study will focus on answering two main research questions:

- What are the main expectations and requests of Portuguese patients?
- What do Portuguese patients think of the National Health Service?

The first question is important to provide information for the main stakeholders about what is expected from the National Health System. Doctors and governments will be interested in knowing the various mindsets of their patients so that they can adapt the services to better serve them. Additionally, it would be interesting to know how individual patient characteristics relate to expectations and if different expectations lead to different satisfaction results.

The second question is designed to provide feedback about the current opinion of the Portuguese population regarding the healthcare service. It is important not only to see if patients are satisfied, but to go a little bit further and identify sources of dissatisfaction. It would also be important to see how satisfaction correlates with individual characteristics.

Thesis Structure

The answer to these questions is organized in four additional chapters. Chapter 2 provides an extensive analysis of the current literature on the topic, covering a brief overview of the healthcare industry and a Portuguese health system description as well as a critical analysis of the current knowledge on patient expectations and patient satisfaction. Subsequently, in Chapter 3, the main methodology chosen is discussed and justified by stating its main advantages regarding other forms of data collection available. Finally, Chapter 4 presents the empirical results and Chapter 5 summarizes the main conclusions, establishing future research topics and providing future recommendations for the main stakeholders of this work.

Literature Review

Describing the Health Care Industry

In 2012, the United Nations General Assembly approved a resolution to ensure that governments would focus on providing universal access to affordable and quality health services. This measure confirmed, not only the consensus on the urgency of achieving Universal Health Coverage, but also the level of political concern about the world's health systems (Boerma, et al., 2015). Additionally, as the population ages, with predictions estimating that by 2020 over 604 million people will be more than 65 years old (8% increase from 2015) (Deloitte, 2017), health providers and governments will need to address a series of operational and financial challenges, not only to achieve the goals already mentioned but to control the exponential climb of healthcare costs. As private spending on healthcare increases and the health market becomes deregulated, patients will demand more quality from their health providers (Deloitte, 2016). Thus, governments and providers face a tridimensional challenge to reduce costs, achieve universal health coverage and ensure a higher quality of care to satisfy increasingly demanding “customers”.

A “shift from volume to value” has been assumed to be an important strategic move in addressing these issues, especially the need for improved quality (Ash & Volpp, 2012; Deloitte, 2016; Porter & Lee, 2013). In fact, in some countries that shift has already begun, starting by the financial side of the equation as “the way in which providers are paid is known to have a profound impact on the volume and quality of health services delivered” (Cashin, et al., 2014). Therefore, it's no surprise that “over the last ten years, policymakers have turned their attention to one of the most powerful instruments for altering provider behavior – the provider payment mechanism” (Cashin, et al., 2014).

Consequently, new payment and reimbursement models are emerging, also in some “OECD countries like the United States (US), United Kingdom (UK), and Germany, linking payment incentives with health outcomes” (Cashin, et al., 2014). These models, known as pay-for-performance (P4P) models, aim to “reward healthcare providers who expand their focus from solely delivering a highly technical set of services that improves the patient's health, to creating an atmosphere that makes hospitalization more humane and respectful of patients' values and preferences” (Stanowski, et al., 2015).

The main goal of these new payment models is to reward not the institutions who deliver more services, but the ones that deliver more value, enhancing the quality of the whole system (Deloitte, 2016). “Patient satisfaction is considered to be a major indicator in the evaluation and improvement of quality in health care” (Hekkert, et al., 2009) and satisfied patients are important for the whole health system because they “comply more with medical treatments, maintain a relationship with their specific provider and recommend the health service to others” (Hekkert, et al., 2009; Manary, et al., 2013).

However, some authors critically claim that patient satisfaction measures have no relation to the quality of care, arguing that “there are unresolved methodologic issues related to the measurement and interpretation of patient experiences” (Manary, et al., 2013). “In addition, patients often request discretionary services that are of little or no medical benefit, and physicians frequently accede to these requests” (Fenton, et al., 2012) in the name of improved patient satisfaction, that was “associated with lower emergency department utilization, higher inpatient utilization, greater total health care expenditures, and higher expenditures on prescription drugs” (Fenton, et al., 2012). Critics of user satisfaction surveys argue that an “overemphasis on patient satisfaction could have unintended adverse effects on health care utilization, expenditures, and outcomes” (Fenton, et al., 2012).

Although it is reasonable to assume that patient satisfaction will not change healthcare by itself, it has been proved empirically that “satisfied patients are more adherent to physician recommendations and more loyal to physicians”. The ideal design of a patient-centered culture requires that physicians deliver “evidence-based care in accord with the preferences of informed patients”, improving satisfaction but also health outcomes while using resources efficiently. Achieving this will not only require commitment from physicians, but also a deep understanding of what drives patient satisfaction in the first place (Fenton, et al., 2012).

A Brief Overview of the Portuguese Health System

In order to set up the environment where this study takes place, it is useful to review how the healthcare industry is organized in the Portuguese setting. According to Barros (2017), “The Portuguese health system has the (public) National Health Service as its backbone.” Constructed in 1979, the National Health Service (NHS) provides “public insurance, universal coverage, almost free access at the point of use” and it’s mainly financed by general taxation (Oliveira & Pinto, 2005). The NHS is publically governed and its provision is made through a series of public and private providers. Oversight and implementation of health policy is led by the government through the Ministry of Health, whose main responsibilities also include regulation, planning and management of the NHS and regulation, auditing and inspection of private providers (OECD, 2015).

The Portuguese system is designed to promote centralized control, through the Ministry of Health and its several institutions, and decentralized management with 5 Regional Health Authorities (RHA) (North, Center, Lisbon and Vale do Tejo, Alentejo and the Algarve). These RHA’s “are responsible for the regional implementation of national health policy objectives and coordinating all levels of health care, following regionally set health plans and directions from the Ministry of Health”. (OECD, 2015) However, the RHAs have been restricted to the management of primary care, and most powers are still exercised at central government level. (Oliveira & Pinto, 2005) Additionally, these authors are critical of recent reforms and posterior implementations of the “actual” NHS, claiming that it “eroded the equity principles on which the system was, in theory, based”. As an example, they claim that “the care provided by the NHS has never been free at the point of use and the system has never provided the promised generality of benefits (e.g. coverage for all health care services)” (Oliveira & Pinto, 2005).

Provision of Services

By feeling ill, the patients’ first contact with the health system can happen through a multitude of different services: “the NHS call line, primary care in the public sector, individual or small medical practices in the private sector, private or public hospital emergency services” (Barros, 2017). Primary care provision in Portugal is mainly organized within the NHS (Barros, 2017) while Secondary care in Portugal consist of both publicly and privately owned facilities with most of the hospitals concentrated in the coastal region.

Regarding Tertiary care, Barros (2017) states that “long-term care services are part of the national network of continued care, which has NHS units and contracts with private entities, both for-profit and non-profit.” Most of these entities are nursing homes or recovering facilities and “many of the non-profit organizations involved in long-term care are associated with local faith-based charities, which have a long tradition of caring for the elderly in Portugal.”

Coverage

In terms of health coverage, “the NHS provides universal and comprehensive coverage”. The user charges exist as a way to moderate demand with exemptions created to ensure that “no person in need is denied access to healthcare due to financial barriers” (Barros, 2017). Major inequalities arise, however, due to the possibility of having double health coverage. This can be achieved by subscribing a private Voluntary Health Insurance (VHI) or by having access to one of the multiple insurance schemes offered to certain type of professionals (health sub-systems).

VHI is offered in the private market, under both individual and group policies, allowing for faster access to healthcare, mainly medical specialists and exams. Health subsystems, on the other hand, provide coverage for certain type of professionals, with the most significant being ADSE, for state workers and SAMS, for banking professionals. With subsystem coverage, is possible to go to a specialist consultation without referral from primary care and it’s possible to access private providers (under reimbursements and copayments) (Barros, 2017).

This is a base of major criticism by most authors as “people enrolled in most subsystems and in private health insurance are free to purchase services wherever they choose” (Oliveira & Pinto, 2005), while those with only one degree of coverage are limited to the NHS services and methods.

As an example, within the public sector, from 2013 to 2015 there “was a decrease in the use of emergency services of the NHS”, while “there was an increase in the use of private hospital unscheduled and emergency services” (Barros, 2017). This was a response to the increase of user charges in NHS hospitals in 2012 that led those covered by public and private health subsystems to “attend private hospitals as the associated copayment was smaller than the user charge prevailing in the NHS hospitals” (Barros, 2017)

Funding

“The Portuguese health system is funded mostly through taxes, but also with a relatively considerable rate of cost-sharing” through out-of-pocket payments by patients (OECD, 2015) According to Barros (2017), out-of-pocket payments from households represent 27% of the total funding for health with a considerable proportion being pharmaceutical products and exams. In concrete terms, total health expenditure in Portugal has increased steadily in the last 20 years, with the country being one of the top health care spenders in the EU in terms of GDP (Oliveira & Pinto, 2005). By 2015, health care expenditure per capita in Portugal was 1.967€ (for the EU28, health expenditure per capita is 2.781€) (Barros, 2017).

Understanding Patients' Expectations

In the last section, the quality and status of the Portuguese healthcare system was reviewed, but studying patients, by assessing their expectations and satisfaction levels, can provide us with a more complete picture, incorporating both supply-side and demand-side aspects.

An important note, however, should be made regarding satisfaction study results. It can be tempting to assume that high satisfaction is connected to high quality of care. However, Locker & Dunt (1978) warned researchers and governments to be aware that “expressions of satisfaction should always be interpreted in the context of some understanding of the rationale that underlies those expressions, rather than being taken at face value”. With this in mind, it can be assumed that in order to really know what patients think, we really need to understand how they think, that is, to study what are the psychological processes that motivate a given satisfaction response.

According to Thompson & Sunol (1995) “expectations are believed to be one of the primary determinants of patient satisfaction”. Largely studied by the fields of marketing and psychology, Zeithaml et al (2009) defined customer expectations “as beliefs about service delivery that serve as standards against which the quality of a service is judged”. Transposing to the healthcare context, one can classify expectations as “beliefs [...] formulated by clients or patients about the services they think they are to receive” (Thompson & Sunol, 1995).

In order to provide structure to the analysis, this study uses Thompson & Sunol (1995) classification of expectations in 4 main categories: Ideal; Predictive; Normative and Unformed

Ideal expectations are classified as aspirations, desires and preferred outcomes. They are what the patient thinks the service can be or “the user’s perspective of the potential for a service”. Normative expectations represent what should happen and “can be equated to what users are told, or led to believe, or personally deduce that they ought to receive from health services”. Predicted expectations are the realistic and anticipated outcome. They can be classified as what the patient believes it will actually happen and “they’re likely to result from previous experiences, reported experiences and other sources of knowledge”. Lastly, unformed expectations tend to occur when patients are unable to articulate their expectations. This can happen either because they don’t have any, because they find it too difficult to express them or simply because they take some attributes of care for granted.

Expectations, as beliefs, must be supported and sustained by cognitive processes (Thompson & Sunol, 1995) which in turn are modified and formed through a set of influencers. These influencers were classified as Social, the result of sociodemographic characteristics, group pressure, equity standards and social norms; Context related; and Personal, concerning individual needs and values. (Thompson & Sunol, 1995)

At Context level, it is important to highlight the very specific nature of the healthcare environment in the formation of expectations. In those terms, generalization of consumers’ preferences to the field of healthcare must be done bearing in mind the characteristics of this specific environment. Thompson & Sunol (1995) highlighted several number of reasons that justify this argument.

According to the authors, “the duration of the interaction [...] is usually more than momentary and [...] can be very long”. The affective state as well, the authors point out, is very different than someone who is buying a car or staying in a hotel. Additionally, the authors argue that the purpose of health services is concerned with needs as opposed to wants or desires, thus, “the goal of health policy should be to create and sustain a healthy population, by meeting their needs rather than creating unnecessary demands” (Thompson & Sunol, 1995). Finally, the emotional charges involved in a given interaction with the service can difficult the way in which patients communicate their expectations, “for example, delivery of a healthy baby can remove from memory some of the dissatisfaction that may have occurred during antenatal care” (Thompson & Sunol, 1995).

How does Patients' characteristics influence their Expectations?

In the Social category, culture is believed to play an important part in shaping expectations. Several studies have found empirical evidence confirming that different cultures resulted in different patient and consumer preferences (Bianchi, 2001; Dash, et al., 2009; Furrer, et al., 2000; Polsa, et al., 2013). Additionally, Donthu & Yoo (1998) have studied the impact of the famous Hofstede's cultural scale on the patients' mindset, concluding that low power distance, individualism and high uncertainty avoidance are positively related to higher expectations. Karami et al (2016) found, not only that expectations have an impact on latter perceptions of quality, but also that cultural values have significant impact on patients' preferences and perceptions, allowing us to reinforce the importance of studying this problem at country level. Finally, Jung et al. (2003) studied how patient demographic characteristics influence their expectations, discovering that variables like age, gender, education and socioeconomic status yielded different preferences for different groups of patients. For example, the authors found evidence that younger patients tend to value "control over their healthcare, clear involvement in decisions and being told the truth" more than older patients. On the other hand, older patients expected a more traditional doctor role, linked with GP care as opposed to specialist care, preferred by younger patients (Jung, et al., 2003).

This can be linked with the Personal category of influencers of patients' expectations. According to Cheraghi-Shoi et al. (2006), "patients only have pre-determined preferences for a small set of issues of immediate concern", for example, patients have formed expectations regarding waiting times because of everyday experience. However, "when faced with novel attributes patients may not have an experiential basis within health care to make an immediate response".

As Hills (2002) argues that attitudes, cognitions, emotions and behaviors are based on one's values, it makes sense that "making a judgement of preference for a novel entity means judging it with reference to this abstract value system structure" (Cheraghi-Shoi, et al., 2006).

In this field, the theory of basic values constructed and present by Schwartz in 1987 ((Schwartz & Bilsky, 1987; Schwartz, 1992; Schwartz, 1994) and reviewed in 2012 (Schwartz, et al., 2012), can help us better understand personal differences towards expectations of healthcare.

The author defined basic values as “trans-situational goals, varying in importance, that serve as guiding principles in the life of a person or group” (Schwartz, et al., 2012) and “arranged the values on a circle that represent a continuum of related motivations, like the circular continuum of colors” (Davidov, et al., 2008)

Figure 1 – The Circular Motivational Continuum of 19 values (Schwartz, et al., 2012)



According to the theory, the top half of the outer circle represents the growth values, the ones more likely to motivate people when they are free from anxiety. Conversely, the bottom half represents values people use to protect themselves from anxiety and threat. On the right, values reflect a personal focus and on the left, they represent greater social concerns. Interestingly, the 4 main categories of values are organized in a way that pursuing a determined category conflicts with the

correspondent category on the other half of the circle, thus, pursuing self-direction values, would conflict with the pursuing of traditional and conformity values (Schwartz, et al., 2012).

This rationale can provide theoretical evidence to explain the relationship between sociodemographic characteristics and patients’ expectations. Schwartz et al (2012) found empirical evidence to support that age correlated positively with conformity, tradition and security values, explaining why older patients tend to prefer a more traditional doctor role. On the same note, it could be that younger people pursue values more related to self-direction of thought and action, preferring a more active role in their healthcare management. Glenn (1974) offered a theoretical hint into this by arguing that “people tend to become more embedded in social networks and more committed to habitual patterns as they grow older”.

Additionally, self-direction values correlated positively with education, which confirms Jung et al (2003) empirical evidence that more educated patients prefer a more democratic doctor, more information and more specialist care than less educated patients. As “education likely enhances the ability and motivation to think independently” (Schwartz, et al., 2012), more educated patients relate and pursue self-direction values, formulating their expectations and preferences towards a democratic doctor and shared decision-making.

How does Patients' Expectations relate to Patient Satisfaction?

Finally, It is important to understand how patient expectations relate to patient expressions of satisfaction or dissatisfaction.

One of the first theories to emerge in the Literature on this topic was the “value-expectancy model” (Linder-Pelz, 1982), which stated that patient satisfaction related to the patients' beliefs that care possesses certain attributes and the patients' evaluation of those attributes. In sum, patient satisfaction would be a result of two different sources of information: patients' beliefs and his/her evaluation of the dimension of care.

Williams (1994) offered a different point of view by questioning whether patient satisfaction could be viewed as largely the fulfilment of patient expectations and values. In fact, an additional study conducted by Linder-Pelz found out that expectations and perceived occurrences related independently to satisfaction, rather than satisfaction resulting from the interaction between the two. Additionally, this study was not able to confirm the expectancy value theory, with expectations explaining only 8% of the total variation in satisfaction (Linder-Pelz, 1982). Williams (1994) further argued that expectations might not even exist in the first place, claiming that “if the patients come into contact with the system for the first time then expectations [...] might be waiting formation”. In the same note, Williams adds that even if expectations exist, the legitimacy of its relationship to satisfaction is dubious. For example, patients might feel their expectations regarding high technical aspects of care to be not valid and, as a consequence, some “reports of satisfaction [...] may be more accurately interpreted as an expression of confidence in the ability of the medical staff”. Lastly, Williams concludes that even if expectations exist and their relationship with satisfaction is valid, evaluations of care hardly reflect the quality of care. If a patient expects his doctor to assume a paternalistic role and assumes that his role is to remain passive, the fulfilment of these expectations might produce a positive evaluation that is irrespective of the quality of care.

In order to better understand the relationship between these two dimensions, it is useful to look at the marketing literature on consumer satisfaction. A dominant theorem is the expectancy disconfirmation paradigm that claims that “satisfaction or dissatisfaction is the result of a comparison between prior expectations and perceptions of actual product or service attributes” (Thompson & Sunol, 1995).

“Consumers are posited to form pre-consumption expectancies, observe product performance, compare performance with expectations, form disconfirmation perceptions, combine these perceptions with expectation levels and form satisfaction judgments” (Oliver, 1993). Additionally, in a model presented later in this thesis, Oliver altered his view by claiming that disconfirmation was only one dimension of the cognition component of satisfaction. According to the author, “satisfaction is a function of cognition, affect, and direct experience” (Oliver, 1993).

In order to better explain the effect of disconfirmation, and consequently expectations, on satisfaction ratings, Anderson (1973) developed the assimilation-contrast theory in which the author claims that when perceptions of attribute performance differ only slightly from expectations, there is a tendency for people to displace perceptions towards their expectations, calling this phenomenon “the assimilation effect”. However, there’s a point where people stop displacing and start exaggerating the increasingly large variation between perceptions and expectations, a phenomenon called “the contrast effect” (Anderson, 1973).

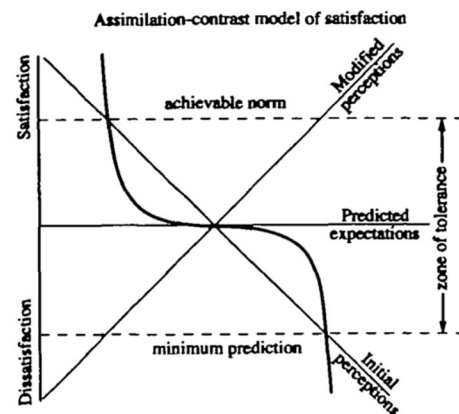
Additionally, Parasuraman et al (1991) suggested that between the levels of normative expectations (what the consumers think it should happen) and the minimum predictable expectations (what the consumers think it will probably happen), service perceptions will be satisfactory, defining this zone as the “zone of tolerance”. Furthermore, the authors distinguished between outcome and process expectations, which is useful since in the healthcare context, expectations people hold about outcome may be higher than those hold about process. While the quality of hospital food may be important, it is likely to have larger zone of tolerance, and a lower level of normative expectations than certain medical procedure or surgery.

To sum up, Thompson & Sunol (1995) developed a more complete model, combining these mentioned contributions. This model offers a better understanding of how patient expectations can impact post-assessed satisfaction and its graphic representation is exhibited in Figure 2.

According to this model, assimilation effect is deemed to occur within the zone of tolerance, with the lower end being the minimum predictable expectations and the upper end being the normative expectations.

When predicted expectations are lower than initial expectations, there's only a small amount of satisfaction. Initial perceptions tend to be downgraded to match predicted expectations.

Figure 2 – The Assimilation-contrast model of satisfaction (Thompson & Sunol, 1995)



Conversely, when predicted expectations are slightly higher than initial perceptions, perceptions tend to be augmented to match predicted expectations, thus producing less dissatisfaction than would otherwise be predicted.

Outside the zone of tolerance, the contrast effect takes place. When predicted expectations are well below initial perceptions, high satisfaction is increasingly exaggerated, while on the other hand, when predicted expectations are well above initial perceptions, high dissatisfaction might be evident.

This model offers theoretical evidence to the reasons why disconfirmation theory has empirically been unable to explain large variations of patient satisfaction (Thompson & Sunol, 1995). However, as the authors point out, it is important to consider that “patient satisfaction is, by definition, an affective domain, whereas expectations lie within the cognitive domain” therefore, specially in the healthcare context, the affective states of the patient might have a serious effect in its cognitive evaluations.

Understanding how patient expectations relate to their satisfaction perceptions and satisfaction evaluations is useful, however, “if we wish to fully understand the views of service users we must first discover what rights and obligations they sense they have, in other words what they perceive their role to be” (Williams, 1994).

In order to achieve this, Chalamon et al (2013) developed a segmentatiton tool to empirically classify patients in terms of their expectations. In their study, the authors identified four main patient profiles:

The Hedonist – “For these patients, buying healthcare products is similar to shopping”. These patients love going to the doctor and they visit one even when it is not necessary. They are less sensitive to price and enjoy buying new medicines.

The Functional – In this group patients look essentially for efficiency and quickness of service. They visit doctors when they feel ill or when they think they need. “The more practical the healthcare system is, the more satisfied they will be”. They are not sensitive to the price.

The Trustful - Patients in this group have been found to be older than the others. “For these patients, the doctor is viewed as a confident and the pharmacist as an adviser”. Besides trusting the healthcare system, they give more importance to relationship they have with their doctor.

The Critical (Consumerist) - About 74% of the patients in this group reported a monthly income under €1500 (under this study). These patients are very sensitive to price and need to ask questions and solicit advice to feel more confident. Moreover, these patients have a cost-optimization approach, adopting strategies to obtain lower prices or totally reimbursed products.

Defining Patient Satisfaction

What is Patient Satisfaction?

“The lack of attention to the meaning of the construct "patient satisfaction" has been seen as the greatest single flaw in patient satisfaction research” (Sitzia & Wood, 1997). In fact, there’s substantial academic controversy towards what patient satisfaction really means, what are its drivers and how should it be measured (Gill & White, 2009; Sitzia & Wood, 1997; Williams, 1994). There is a vast number of studies that focus on assessing patient satisfaction, but there is currently a small body of work “which critically reviews the literature and analyses the construct and its use” (Gill & White, 2009). Furthermore, Crowe identified some agreement that a universal definition of satisfaction with healthcare has not been achieved and that “understanding the process by which a patient becomes satisfied or dissatisfied remains unanswered.” (Gill & White, 2009)

Historically, the main theories regarding the topic were published in the 1980s. Gill & White (2009) reviewed the literature and resumed research into five key theories of patient satisfaction:

- 1) The discrepancy theory proposed by Fox & Storms (1981) defines satisfaction as “the perceived discrepancy between that which an individual desires and that experienced as a proportion of those desires” (Williams, 1994). Fox & Storms (1981) further argued that the focus shouldn’t be achieving consistent satisfaction ratings, but understanding the conditions that lead to discrepant results. “This implies that a concentration upon areas of expressed dissatisfaction is more valuable than obtaining consistency of expressed satisfaction” (Sitzia & Wood, 1997). In fact, a positive satisfaction rating does not necessarily mean that the patient is satisfied, it could only mean that nothing bad has happened at all.
- 2) A contrasting theory was proposed by Linder-Pelz (1982) postulating that satisfaction is a “positive evaluation of distinct dimensions of care”. Known as “the Value-Expectancy model”, the theory establishes that satisfaction is an expression of an attitude, an affective response related to the patient’s beliefs that care possess certain attributes and the patient’s evaluation of those attributes. (Sitzia & Wood, 1997)

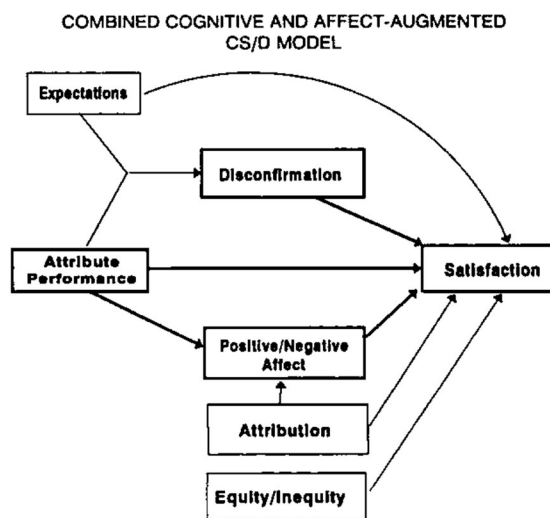
- 3) The Determinants and Components theory developed by Ware et al (1983) divided satisfaction into its determinants, composed by “patient” characteristics such as expectations and sociodemographics, and its components, composed by the several dimensions of care (interpersonal manner, technical quality of care, assessibility/convenience, finances, outcomes of care, physical environment, availability and continuity of care). Additionally, Ware et al (1983) were among the first to establish the difference between satisfaction reports and satisfaction ratings, enhancing that “it is wrong to equate all information derived from patient surveys with patient satisfaction”. According to the authors, surveys are composed of objective and factual reports and subjective ratings. “For example, patients can be asked to report the length of time spent with their provider or to rate whether they were given enough time”, therefore, “satisfaction ratings attempt to capture a personal evaluation of care that cannot be known by observing care directly”. (Ware, et al., 1983)
- 4) Fitzpatrick & Hopkins (1983) offered a different approach by explaining satisfaction through a set of three different models, which one of them strongly linked to one determinant of satisfaction. In the first model “the need for familiar”, the authors argue that expectations, socially created, are the primary determinant of satisfaction influencing satisfaction directly. The second model, “the goals of help-seeking”, states that the major concern of patients is not satisfaction, but some resolution to their health problem, meaning that patients are likely to judge a health professional or treatment by whether it helps them to achieve their goals or not. Finally, the last model, “the importance of emotional needs”, proposes that affective and emotional states are present in every healthcare interaction, with many patients experiencing uncertainty and anxiety. Therefore, patients will judge “satisfaction” by observing affective behavior and communication skills of their doctors and nurses. (Sitzia & Wood, 1997)
- 5) Finally, Donabedian, in his well-known model of overall quality in healthcare, defined satisfaction as “the principal outcome of the interpersonal process of care”. Despite, arguing that a patient judges the quality of care in all aspects, he does it in particular to the interpersonal component of care. (Gill & White, 2009)

More recently, Crowe et al. (2002) and Urden (2002) pointed out that “patient satisfaction is a cognitive evaluation of the service that is emotionally affected, and it is therefore an individual subjective perception” (Gill & White, 2009). In fact, critics of patient satisfaction studies and surveys highlight its subjectivity as one of the main flaws of this instrument.

However, Ware et al (1983) argued that this is also one of its unique strengths, as satisfaction ratings are believed to bring new information to the satisfaction equation, mirroring realities of care and reflecting personal preferences and individual expectations.

Outside the healthcare context, Oliver’s cognitive affective theory (Oliver, 1993) seems to provide a similar definition and an overall view of the theories presented above.

Figure 3 –The Cognitive-Affective model of satisfaction (Oliver, 1993)



The model represented in Figure 3, considers two big domains that influence consumer evaluation of post-purchase. On one hand, “the cognitive antecedents [of satisfaction, that] include expectations, performance, disconfirmation, attribution, and equity/inequity”, with disconfirmation being the interaction between expectations and initial perceptions and attribution being described as process by which consumers attribute favourable outcomes to themselves through the consumption of the good/service.

On the other hand, Oliver recognized that satisfaction is also influenced by an array of affective states. According to the author, consumers “form two summary affect states, one based on the positive affects in consumption and the other on the negative affects”. Interestingly, these affective states are believed to make independent contributions to overall satisfaction, for example, “a restaurant dining encounter evokes both negative and positive affective reactions because of the complexity of this type of service”.

In the cognitive side of the equation proposed, it is worth noting that expectations make two different contributions to satisfaction, influencing it directly, regardless of any aspect of care, and indirectly through the disconfirmation phenomenon. Additionally, equity has a direct influence on satisfaction as “generally, consumers tend to be more satisfied when they perceive fair treatment” (Oliver, 1993).

Finally, the empirical test of this model offers an useful insight to its use in the healthcare context. The study included two samples, comparing satisfaction of people buying a car and satisfaction of people attending a marketing course, concluding that disconfirmation was the best predictor of satisfaction in the first situation but that affect was the best predictor for satisfaction in the second situation. Thompson & Sunol (1995) offered an explanation claiming that “it may be that students' fear of failure in their course leads to dissatisfaction”.

At last, it is important to distinguish between perceptions of service quality and patient satisfaction. “In the healthcare sector, there is an urgent need for differentiation and standardisation of the definitions and constructs for satisfaction and perceived health service quality” (Gill & White, 2009), with both terms being confused in the literature and patient satisfaction being often used as proxy to measure health service quality perceptions.

Dagger et al (2007) defined service quality as a “consumer’s judgment of, or impression about, an entity’s overall excellence or superiority” and developed a model according to which patients evaluate quality in three base dimensions.

Figure 4 – Multidimensional Hierarchical Model of perceived service quality (Dagger, et al., 2007)

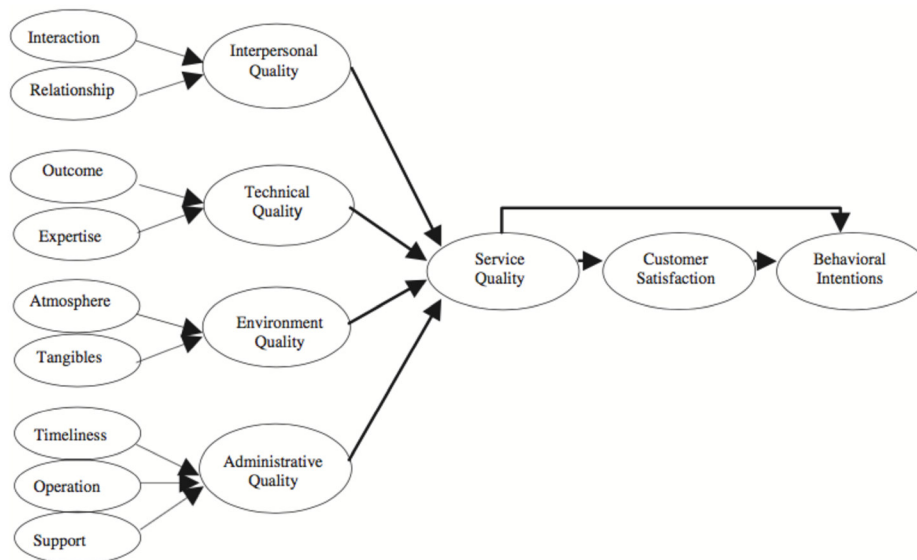


Figure 4 presents that model, establishing the four bases of service quality perception: interpersonal quality; technical quality; environmental quality and administrative quality. The authors add nine underlying subdimensions by which patients evaluate a given health service.

Importantly, this study found out that service quality is one important determinant of both satisfaction and behavioral intentions of patients, suggesting that perceiving health service as a quality one leads to happier patients and more commitment to treatment and guidelines. Additionally, the authors clarify that “service quality, as a cognitive evaluation, precedes the more emotive satisfaction construct”.

As a recommendation for researchers and other stakeholders, Gill & White (2009) argue that “a focus entirely on perceived service quality, as the definitive construct, is justified”, given “the existing evidence that the patient satisfaction is an unpredictable construct”. In fact, it is possible to relate the model proposed by Dagger with the one proposed by Oliver, by replacing “attribute performance” for “service quality” in the model of Figure 3.

How does Patient Satisfaction relate to Patient Characteristics?

Lastly, understanding how social and personal characteristics can affect healthcare satisfaction will prove to be useful in the interpretation of results. As “it is commonly believed that satisfaction with health care may be dependent upon variables such as social class, marital status, gender, and - in particular – age” (Sitzia & Wood, 1997).

Regarding age, several studies have found empirical evidence that older patients tend to report higher satisfaction levels than younger users (Sitzia & Wood, 1997). Additionally, evidence from satisfaction studies in Portugal also confirm this result. (Lemos, et al., 2009; Mendes, et al., 2013). Justifications for this can be found in the “Understanding Expectations” section of this document where it is argued that possibly older patients have less expectations than their younger correspondents, assuming a behavior similar to the “Trustful” segment described before. Sitzia & Wood (1997) confirmed that research shows that older respondents expect less information from their doctor but also that older patients are more satisfied with more aspects of care than younger patients. Finally, younger patients were said to comply less with medical instructions (Sitzia & Wood, 1997), a result that might be explained by their easiness of looking for information on online sources. It could be the case that younger patients are, not better but, more informed and thus more skeptical of doctor’s advice, but no direct empirical evidence was found to confirm this hypothesis.

Empirical research, however, confirmed that education is significantly and negatively related to satisfaction, meaning that high education leads to lower satisfaction ratings (Hall & Dornan, 1990). However, generalization of these results should be viewed skeptically, given cultural differences between the Portuguese and American cultures. Despite the lack of empirical evidence in Portugal, Mendes, et al (2013) in a study conducted in Alentejo region, with a “low educated” sample, identified high levels of general satisfaction with primary care, that can represent a tendency to confirm the overall trend that more educated patients tend to be less satisfied with medical services.

Gender differences and its relation to satisfaction is a controversial topic in the literature with some authors arguing for no significant relationship (Hall & Dornan, 1990) and few reports stating otherwise (Sitzia & Wood, 1997). In Portugal, Pereira, et al (2001) reported that gender was one of the main predictors of satisfaction and the study results indicated that female patients were globally less satisfied than male patients.

Additionally, social class and income level yield interesting results, indicated that higher classes tend to be more satisfied with healthcare than lower classes (Sitzia & Wood, 1997), despite some lack of consistency of the term “social class” (Hall & Dornan, 1990). This result can be also explained by the segmentation described in the last section of this thesis. As Chalamon et al (2013) stated, “The Hedonist” group related to higher income levels, thus its normal to assume higher levels of satisfaction among this group.

At last, social influences can lead to interpretation mistakes that can prove to be fatal in any study of satisfaction. Sitzia & Wood (1997) reported a group of biases and effects found in the literature that can alert us to the common unconscious behaviors of reporting patients. The “social desirability response bias” indicated that users may report greater satisfaction only because they believe that positive comments will be more socially acceptable to the researcher. In the same line of reasoning, patients will fall into the “ingratiating response bias” if they attempt to look nice towards the survey administrator or medical staff. On the other hand, if patients feel that the continuation of a given subsidy or social program depends on satisfaction ratings, they will act on self interest, evidencing “self-interest bias”. Interestingly, the well known “Hawthorne effect” can provide bias to the data collection. The simple fact that users realise that health suppliers are concerned about their opinion can lead to a more positive perception of service quality. Conversely, “the cognitive consistency theory” postulates that patients might report high satisfaction levels as a way to justify the time and effort invested in the treatment. Finally, “gratitude bias” and “simple indifference” can lead to confusing satisfaction results, which lead Williams (1994) to conclude that dissatisfaction only occurs when something extremely negative has occurred.

All these considerations must be taken into account not only in the construct of this study, but also in the interpretation of results in order to properly present valid conclusions towards the main stakeholders of this thesis.

Methodology

This thesis' main objectives were divided in two major groups: The study of patient expectations and the study of patient satisfaction. Shirley et al (2016) argue that the literature on patient satisfaction and patient experience has not yet agreed-upon a single standard measurement tool, confirming the claim that there's no perfect way to measure neither patient satisfaction or patient expectations.

Similarly, Kravitz (2001) argued that approaches to measurement of patient expectations differed in 3 main dimensions: - Timing (Before the visit, after the visit or both); - Form of administration (Personal interviews, telephone interviews or self-administered questionnaire); - Level of specificity (using more general questions like "Are there any things you were hoping the doctor would do for you today?" or a more specific approach). The same study concluded that patients disclosed more expectations when presented with a detailed checklist than when interviewed. Additionally, the author also argues that, "for most purposes, post-visit only designs that directly ask about unfulfilled expectations will suffice".

Regarding patient satisfaction, Shirley et al (2016) clarifies that quantitative methods of measuring patient satisfaction are more common, providing more accurate data to evaluate and compare the patients' perceptions and opinions of a given healthcare provider. In fact, Fottler et al (1997), claim that qualitative measures are often related to disadvantages like influencing provider behavior, lack of statistical validity/reliability and greater costs. As a consequence, most qualitative measures are used in order to develop a survey that would later be used in a quantitative assessment (Shirley, et al., 2016). However, the use of quantitative measures could also be linked to some biases and limitations that are addressed in the limitations section of this study.

Ideally, according to the literature reviewed, this study should be done by randomly selecting a given proportion of private and public hospitals in different regions and then inquiring patients randomly on the site about their expectations, perceptions of quality and satisfaction. This would ensure a random, representative sample of the Portuguese population. One post-visit survey should be enough, although two surveys could also be administered to reduce the burden of participating in the study. The patients' waiting time could be used to assess expectations and a second survey could be distributed at the check-out to assess perceptions and satisfaction.

Using this methodology would imply strict collaboration with various healthcare providers and public institutions, not only in terms of licenses and permissions but also regarding staff collaboration to collect and possibly distribute the surveys, thus making it impossible to do within this study's time period. Considering this, a more practical methodology was designed. A single survey was created with the goal of identifying tendencies that could represent the opinions and expectations of the Portuguese population regarding their health system. The survey was composed by two sections, first asking about overall expectations regarding healthcare, and then about overall perceptions of quality and satisfaction with the health system in Portugal. The survey was written in Portuguese and distributed both via online and offline channels to achieve a better response rate from the older generations. Every respondent was required to have more than 18 years old and participants were informed in the beginning about the purpose of the study and the anonymity of their responses.

To assess patients' expectations, the study done by Chalamon et al (2013) was used as a reference. The study was adapted by constructing sentences in Portuguese based on the study's segments descriptions. Respondents were then asked to classify these constructed sentences in a 5-point Likert scale according to their level of agreement. The six main categories (Reasons to visit a doctor; Characteristics of a good hospital/clinic; Preferred doctor/patient relationship; Preferred doctor communication; Position regarding self-medication; Characteristics of a good pharmacy) were assessed with one question per category and each one of these questions had four sentences, linked to a correspondent patient segment. As the profiles were not mutually exclusive, participants were scored in each one of the profiles in a 1 to 30 scale. Later, a descriptive analysis was done to depict the main expectations of the participants of this study and then, an inferential analysis was conducted to check for relations between the patients' profile and patients' sociodemographic characteristics as well satisfaction levels. To do this, first Pearson's correlation tests were run across a set of variables and summarized in a plot, hypothesis were build based on the significant correlations and then Analysis of Variance (ANOVA) tests and t-tests were run to confirm that the relationship was statistically significant.

Patient satisfaction was assessed using Dagger et al (2007) as a reference. In the last section of this thesis, it was argued that there's some academic controversy regarding patient satisfaction due to the lack of agreement regarding its meaning and its descriptive models. Because of this, it seemed preferable to use the model by Dagger et al (2007) rather than a model on patient satisfaction. As perceptions of service quality were identified as a cognitive precedent of patient satisfaction (that is a more emotional evaluation), this model also had the advantage of allowing a reliable understanding of what constituted the main sources of dissatisfaction.

In this study, all the dimensions of the model were assessed because the object of this thesis was not only to understand the patients' perceptions of quality and satisfaction, but also the reasons behind their expressed opinion. The survey proposed by the authors followed the descriptive model already presented in the last section and represented by Figure 4 as respondents were asked to classify sentences in a 7-point Likert scale according to their agreement. The items' classifications were summed and translated into a 1 to 20 scale in each one of the variables, thus allowing for direct comparison. In order to learn more about the relationship between satisfaction and patient socio-demographic characteristics a correlation matrix, based on Pearson's correlation tests, was built and hypothesis were developed based on significant correlations with ANOVA tests used to confirm the results. Finally, because the survey proposed by the academic paper was in English, a translation to Portuguese was required.

The sample was constructed by distributing the survey to friends, family and acquaintances. To promote the participation from different age groups and regions, the offline version was distributed in coffee shops, restaurants and hair salons. Therefore, the sample is not random nor representative of the Portuguese population, a concern whose consequences are later addressed in the results' analysis and limitations section of this study. All the results and statistical treatment of the data were done using R and Rstudio software.

Finally, a trial version of the survey was distributed to two volunteers in different age groups. As a result of their feedback, wording of instructions, questions and sentences was readjusted to avoid confusion and misunderstandings. One variable of the survey and model proposed by Dagger et al (2007), the "Support" component of "Administrative Quality" assessment, was highlighted as problematic by both volunteers.

In the original model, this variable intended to assess patient satisfaction with support services of the provider like groups or activities. As this variable was a variable measuring extra services to inpatients, it was concluded that respondents might not be aware of these services, thus causing confusion and bias in responses. As a result, this variable was excluded from the survey. Additionally, as the survey could be considered repetitive especially in the patient satisfaction dimension, two “attention-check” questions were used to assess if respondents were responding at random with those who failed both questions being removed from the survey.

Results' Analysis

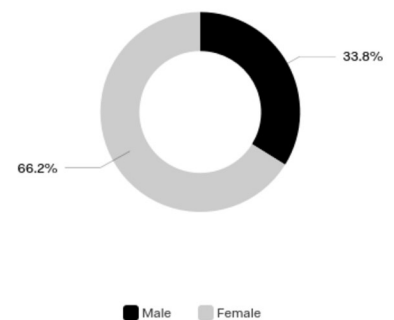
Descriptive Analysis of the sample

This study managed to collect 220 individual responses, from which 15 were rejected because they were not complete. Additionally, 4 responses failed the two attention tests described earlier and were removed from the data, yielding a total of 201 valid responses to the designed survey. To promote a better interpretation of results, it is important to get familiar with the data set collected and, in order to achieve this, responses were analyzed through five main socio-demographic variables: Gender; Age; Income; Education and District of Residence.

Gender

Figure 5 shows the distribution of respondents by Gender, with 133 females and 68 males, concluding that for each male response there was almost 2 women responses. This inequality might be explained by the distribution of the surveys in beauty hair salons, a place more commonly frequented by women.

Figure 5 – Distribution of the Sample by Gender



Age

Respondents' age was, on average, 44 years old with an average distance towards the mean of 18,5 years. Figure 1A, in the Appendix, shows the classification of responses in 4 different age groups (under 30, 30 and under 50, 50 and under 65, over 65). The bulk of respondents were classified in the second group with the least represented segment being the “50 and under 65” group with only 17 responses. Despite this, the National Statistics Institute in Portugal reports an average age of the population similar to the one obtained in this sample (44 years old).

Figure 6 – Descriptive Statistics of Age variable

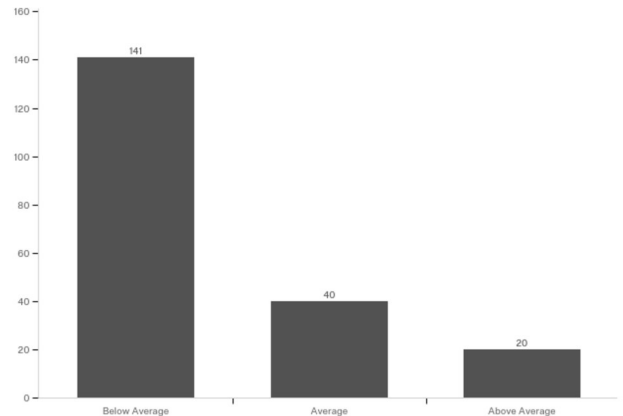
Statistic	N	Mean	St. Dev.	Min	Max
Age	201	44.030	18.506	18	93

Income

Regarding the Income variable, participants were asked to report their family monthly disposable income according to five main groups (less than 1000€, 1001€ to 2000€, 2001€ to 3000€, 3001€ to 6000€, more than 6000€). Figure 2A in the Appendix shows the distribution of the results, providing a highly left-skewed picture which means that there were a lot more respondents from the first two lower income groups than from the other three.

Additionally, responses were also classified according to their positioning towards the national average. According to PORDATA institute, the average disposable income per month in a family is around 2400€ (28,737€/year), so respondents from groups 1 and 2 were classified as “Below average”, respondents from group 3 were classified as “Average” and participants from groups 4 and 5 were classified as “Above Average”. Figure 7 confirms that 141 individuals were classified as “Low Average”, while only 40 and 20 were classified as “Average” and “Above Average”, respectively. This means that around 70% of the sample earns less than the average of the Portuguese population, compromising the generalization of results towards this variable.

Figure 7 – Distribution of the Sample by Income Type



Education

In terms of Education, a similar analysis was done to characterize the sub-population. 54% this sample, as it is possible to see in Figure 3A in the Appendix, is composed by respondents with tertiary education (110 out of 201 participants) while 35% reported having secondary or post-secondary education (71 out of 201 participants). Only 16 participants (8%) revealed having basic education and there were also 4 participants who chose not to reveal their level of studies. Based on these results, participants were sub-divided in two groups, one composed by those having superior education (“High Education”) and another composed by the rest of the sample (“Low Education”).

Figure 8 – Distribution of the Sample by Education Level

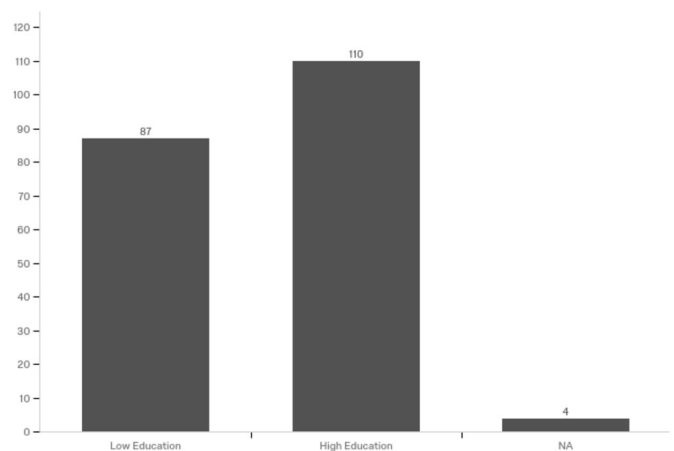
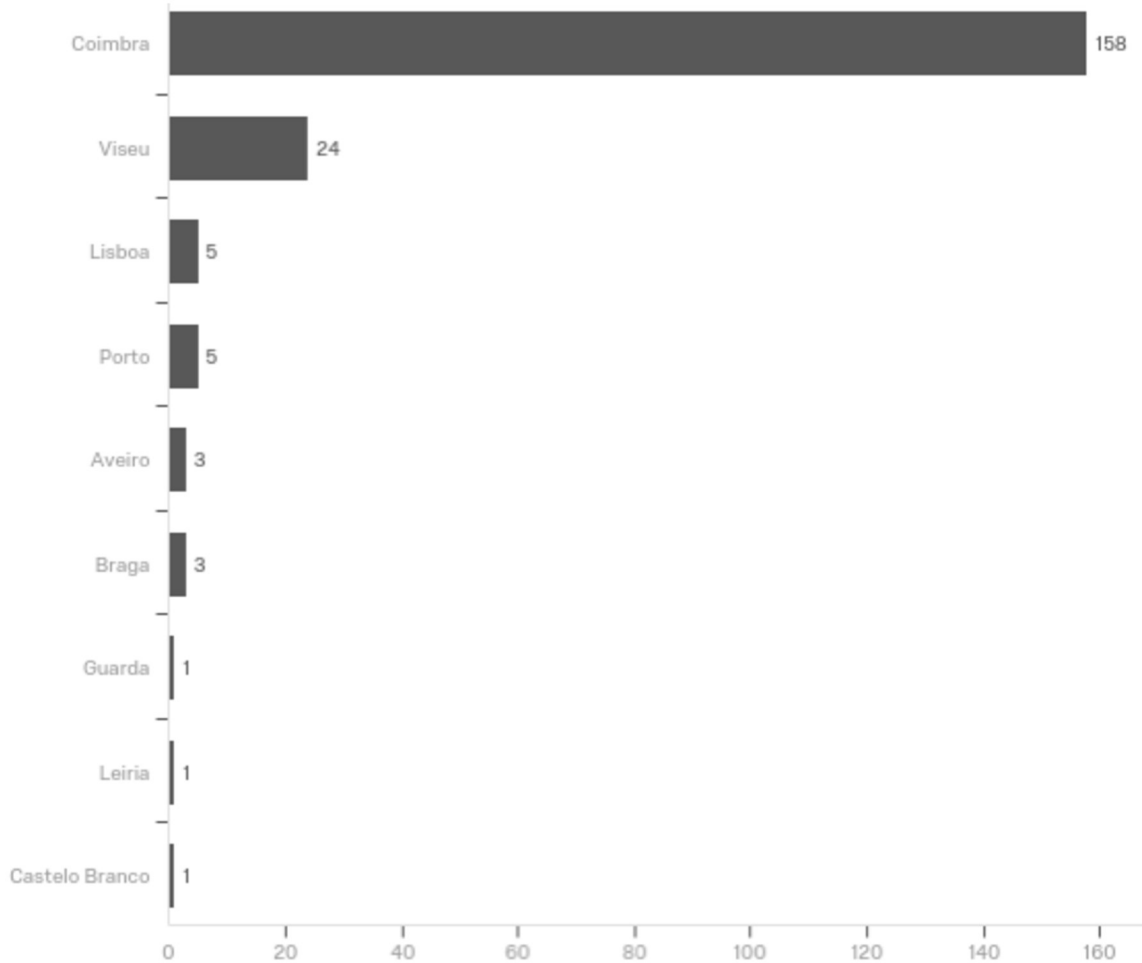


Figure 6 shows the distribution of respondents according to this classification. Comparing these results with data from PORDATA, which tell us that only 17,8% of the population over 15 years old has superior education, it is possible to conclude that this sample is not representative of the population in terms of level of education.

District of Residence

Figure 9 – Distribution of the Sample by District of Residence



Finally, most of the respondents live in the district of Coimbra as this is the hometown of the researcher. These results have serious consequences in the interpretation of further results as Coimbra is, according to PORDATA, the district in Portugal with more doctors and pharmacists with 32,6 doctors and pharmacists per habitant. A comparison between interior and coastal regions is also not possible due to the low representation of interior regions. That being said, the analysis was mainly done by splitting the sample into two groups, those living in Coimbra and those not living in Coimbra with 158 participants living in the city and 43 living outside Coimbra.

What are the main expectations and requests of the Portuguese patients?

One of the main goals of this study was to assess the main expectations that patients had before visiting their doctors. As referred in the Methodology section, this assessment was done using the segmentation of patients, presented by Chalamon, et al (2013) as a proxy to measure the expectations of the participants in this study.

Figure 10 –Descriptive Statistics of Patient Profile Results

Statistic	N	Mean	St. Dev.	Min	Max
FunctionalResult	201	22.746	3.431	6	30
CriticalResult	201	16.224	3.695	6	29
HedonistResult	201	18.323	3.309	6	29
TrustfulResult	201	20.642	3.774	6	29

Figure 10 summarizes the main descriptive statistics regarding the four profiles (Hedonist, Functional, Critical, Trustful). The Functional profile scored higher on average among the

sample, meaning that most patients identify more with “Functional” aspects of care. On the other hand, the Critical profile was the least popular one with an average score of 16.2 out of 30 points possible. A look at the distribution of the profile results in Figure 4A in the Appendix yields the same conclusions with the “FunctionalResult” distribution being noticeable more skewed to the right than all the others.

According to the theory described early, this means that respondents declared a preference for a practical relationship with the Health System, expecting a quick and efficient service from the hospital providers. Trustful aspects of care ranked second on average, possibly indicating that participants trust in the health system and that they value personal relationships with doctors and staff. Conversely, the lower average result of the Critical aspects of care might indicate that most respondents are not price sensitive regarding healthcare expenses and they don’t act on a cost-optimization approach. However, it is important to keep in mind that it is not possible to conclude if this represents the opinion of the rest of the Portuguese population due to the unexistence of a representative sample.

How does Expectations vary with Patient Characteristics?

Another major issue that this thesis was interested in studying was the relationship between expectations and patients' characteristics. Do different patient characteristics yield different expectations types and if so, how do they correlate with each other?

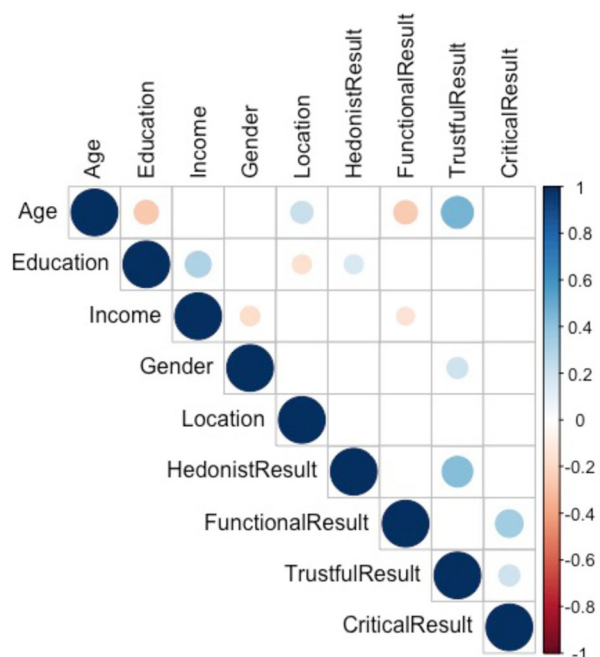
Regarding the first question, we already concluded through the literature that there's substantial evidence that confirms that different socio-demographic characteristics resulted in different expectations, so the focus of this study shifted to the second question. The results were summarized in the matrix represented by Figure 11. In this matrix, correlations are represented by circles, with the color of the circle corresponding to the size of the correlation according to the adjacent scale presented. Significance level is translated by the opacity of the circle, meaning that very significant correlations are clearer. To allow for a better visualization, correlations with a significance level higher than 5% were classified as insignificant and removed from the graph.

The first conclusion that it is possible to withdrawn from this figure is that Location (dummy variable classified into 1 if living in Coimbra and 0 if not) had no effect on patient's profile results, an expected conclusion given that there's not enough variation in the sample to conduct a proper analysis at this variable level.

In contrast, Age reported a significant positive correlation with Trustful results (meaning that older people scored higher in Trustful aspects of care) and a significant negative correlation with Functional results, suggesting that younger participants favored practically in the healthcare service.

In the line below, the graph seems to suggest that Education correlates positively with Hedonist results, with higher educated people identifying more with a pleasure attitude towards health.

Figure 11 – Correlation Matrix of Patient Profile Results and Patient Characteristics



Assuming this relationship to be true, it can possibly be explained by the more predisposition from more educated participants to follow a healthy life style, however, this interpretation must be aware of the possible selection bias presented in this sample.

Finally, while Gender (a dummy variable classified into 1 if female and 0 if male) interestingly correlated positively with Trustful results, indicating that possibly female patients value more the relationship with their doctor and trust more in the health system, Income negatively correlated with Functional results, with higher income participants reporting a lower score in the functional aspects of care.

Based on Figure 11, it was possible to construct five sets of hypotheses that would be tested to confirm these interpretations. Results of the tests, that can be found in Figures 6A to 9A of the Appendix, showed that:

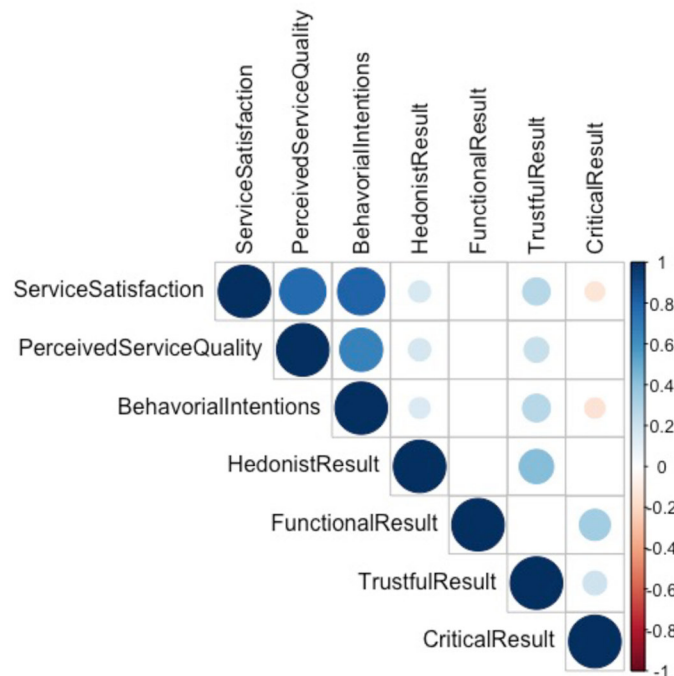
1. Different age groups scored different Trustful results, backing up the conclusion that older participants trusted the health system and value more their relationship with doctors. In this sample, the correlation coefficient between Age and Trustful results was 0.464.
2. Different age groups also scored differently in Functional aspects of care, confirming that there was a correlation between the variables with younger participants valuing more quickness and effectiveness. Estimates in this study indicate a negative correlation of 0.25.
3. There was not enough statistical evidence to reject the null hypothesis that different income groups scored equally Functional results, thus forcing us to doubt the interpretation made earlier about Income and Functional results
4. Differences in Education yielded different Hedonist results, confirming that higher educated participants have a more hedonist perspective of the healthcare system. This sample indicates a correlation of 0.16.
5. Females and Males scored different Trustful results, possibly confirming that Females value more their relationship with the doctor than males and that women trust more in the health system. According to the analysis correlation between these variables was 0.2.

How did expectations relate to satisfaction levels?

Finally, the study of expectations could not be closed until an evaluation of the relationship between expectations and satisfaction levels.

Considering this, a correlation analysis between the results of the 4 main profile types and the main variables used to assess satisfaction (Service Satisfaction, Perceived Service Quality, Behavioral Intentions) was done.

Figure 12 – Correlation Matrix of Patient Profile Results and Main Satisfaction Variables



Results were summarized in Figure 12 using the same classifications and methodology as before. In this figure, it is interesting to see that Hedonist results correlated positively with all variables of satisfaction as well as Trustful results, which can mean that participants who trusted more in the health system and participants who have pleasure in consuming healthcare products are more likely to be satisfied than others.

Conversely, Critical results correlated negatively with Service Satisfaction and Behavioral Intentions indicating that possible, those with a more critical attitude towards health are more likely to be less satisfied.

As described in the Methodology section, t-tests were run to confirm these statements. Detailed results of the hypothesis tested can be found in Figures 10A to 17A of the Appendix. Through these 8 tests it was possible to conclude that:

1. There was not enough statistical evidence to confirm that participants who scored higher on Trustful or Hedonist results scored on average higher satisfaction or higher perceived quality levels
2. It was not possible to confirm that lower Critical results were correlated with lower satisfaction scores.
3. Trustful results were on average higher between participants who also scored higher Behavioral Intentions scores, meaning that in this sample, users who trust more in the health system were more likely to recommend, stay within the same healthcare provider or comply with medical treatment.
4. Participants who scored lower on Behavioral Intentions reported higher Critical results, indicating, as expected, that users who adopt a consumerist approach towards healthcare are less likely to have positive behaviors following the appointment.
5. There was no statistical evidence to confirm that participants who reported higher Hedonist results also scored higher Behavioral Intentions results.

What do Portuguese patients think of their National Health System?

Are Patients satisfied? What were the main sources of dissatisfaction?

Besides the study of expectations in the Portuguese context, this thesis also had the goal of studying current satisfaction levels with public healthcare providers. The main descriptive statistics regarding each one of variables in the model proposed by Dagger can be found in Figure 13.

By first looking at 1st Dimension variables, it is possible to see that average results were satisfactory.

In fact, most of the variables scored positive results (above 10) but all variables scored under 15 (out of 20) possibly meaning that, although participants are satisfied, they think there's a lot of room to improve.

On average, participants classified the quality of the public healthcare service with an 11 in the 1-20 scale, but interestingly, they reported higher satisfaction levels (13/20) and even higher behavioral intentions (14/20).

Figure 13 – Descriptive Statistics of Satisfaction Variables

Descriptive Statistics of 1st Dimension Variables					
Statistic	N	Mean	St. Dev.	Min	Max
ServiceSatisfaction	201	13.195	3.347	2.857	20.000
PerceivedServiceQuality	201	11.930	3.494	2.857	20.000
BehavioralIntentions	201	14.056	3.367	2.857	20.000

Descriptive Statistics of 2nd Dimension Variables					
Statistic	N	Mean	St. Dev.	Min	Max
InterpersonalQuality	201	12.561	3.622	2.857	20.000
TechQuality	201	13.096	3.380	2.857	20.000
EnvironmentalQuality	201	10.869	3.764	2.857	20.000
Administrative.Quality	201	11.689	3.381	2.857	20.000

Figure 14 – Descriptive Statistics of Satisfaction Components Variables

Descriptive Statistics of Interpersonal Quality Variables					
Statistic	N	Mean	St. Dev.	Min	Max
Relationship	201	9.718	4.346	2.857	20.000
Interaction	201	14.126	3.077	2.857	20.000

Descriptive Statistics of Technical Quality Variables					
Statistic	N	Mean	St. Dev.	Min	Max
Expertise	201	14.453	3.394	2.857	20.000
MedicalResults	201	14.556	3.016	2.857	20.000

Descriptive Statistics of Environmental Quality Variables					
Statistic	N	Mean	St. Dev.	Min	Max
Atmosphere	201	11.906	3.787	2.857	20.000
Decoration	201	11.288	3.599	2.857	19.184

Descriptive Statistics of Administrative Quality Variables					
Statistic	N	Mean	St. Dev.	Min	Max
WaitingTime	201	10.128	4.700	2.857	20.000
Operation	201	12.338	3.456	2.857	19.429

Figure 18A in the Appendix, that splits the participants in two groups, those who classified these variables above 15 and those who classified them under 15, confirmed that the number of “Above 15” respondents is significantly higher for Behavioral Intentions than for the other two variables.

The 2nd Dimension variables can help us find out the reasons for these overall results. Average scores for these 4 groups were quite different with Interpersonal and Technical Quality scoring higher averages than Environmental and Administrative Quality. The interpretation of this result is straightforward possibly meaning that participants in this study considered that Environmental aspects, such as decoration and infrastructures, as well as Administrative aspects, such as waiting time and efficiency, were worse than staff related aspects measured by the other two groups (Interpersonal and Technical Quality).

In figure 14, it is possible to find the average results per components of these groups. In here it's possible to conclude that despite a good average result in Interpersonal Quality, Relationship was considered negative, possibly meaning that respondents think that work must be done to improve how medical staff interacts with its patients. Additionally, Waiting Time registered the second lowest average result indicating that participants are not satisfied with this component of care. Interestingly, both components of Technical Quality reported a very good average result when compared to other variables, possibly meaning that participants have confidence in the expertise and medical results of public healthcare providers.

Satisfaction Levels and Patient Characteristics

At last, this research was interested in learning more between the relationship between patient satisfaction and patient characteristics, more specifically how did satisfaction variables vary with patient socio-demographics.

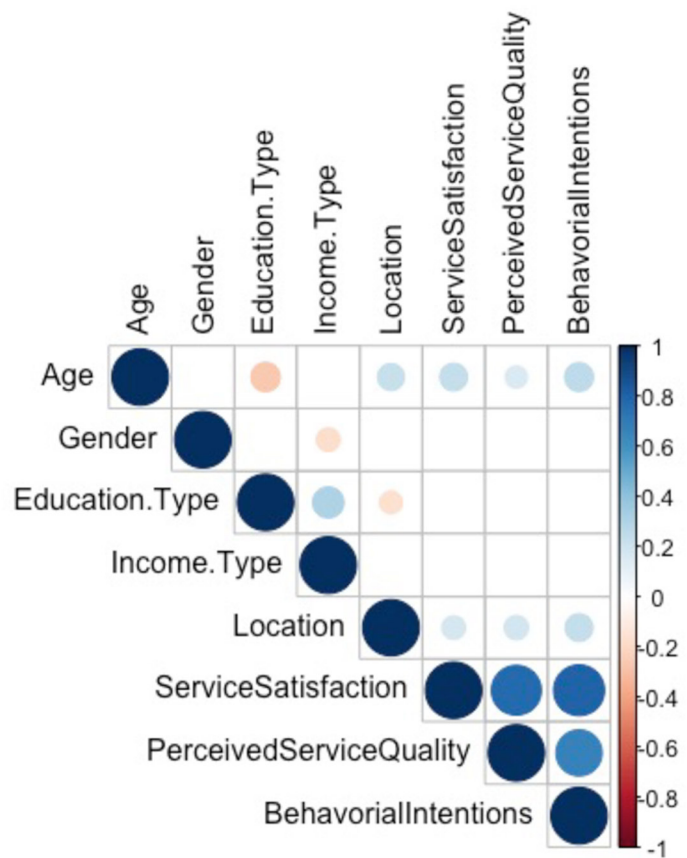
Once again, a correlation matrix between socio-demographic characteristics and patient satisfaction's main variables was build.

From Figure 15 it is possible to notice that neither Education, Income or Gender correlated with satisfaction variables.

Age and Location correlated positively and significantly with Service Satisfaction, Perceived Service Quality and Behavioral Intentions, however, these conclusions must not be taken at face value. While in the case of Age, these results can possibly indicate that older patients usually report higher satisfaction and quality levels, in the case of Location (dummy variable equal to 1 if participant is living in Coimbra) as this variable also correlates with Age and most of the sample lives in Coimbra, the results towards these variables might be highly biased.

Assuming they're not, participants living in Coimbra reported higher satisfaction levels, results that can reflect the higher habitants per doctor ratio in this city. Finally, it is important to notice that these results must not be generalized as this sample is not representative of the Portuguese population.

Figure 15 – Correlation Matrix of Main Satisfaction Variables and Patient Characteristics



In order to confirm these interpretations, ANOVA tests were run to confirm if the difference in means between different groups was not due to simple variance between observations. The results of these tests, that can be found in Figures 19A to 25A in the Appendix, reported that:

1. Different Age groups had different Satisfaction and Behavioral intentions scores, confirming the hypothesis that older participants evaluated satisfaction in the healthcare service higher than younger participants and that older participants were also more likely to comply to treatment and recommend the health facility to a friend.
2. There was not enough statistical evidence to confirm that different Age groups perceived quality differently.
3. Participants living in Coimbra scored higher scores in all 3 variables, possibly indicating that Coimbra, due to its high coverage of doctors and health services yields higher results.

Conclusion

This thesis arose from the need to investigate Portuguese patients' opinions towards the National Health Service. Based on the high focus of Portuguese academic research and public discussion on supply-side problematics, this work was intended to alert for the need to shift this focus towards a more patient-centered view of the healthcare system. Concretely, this research proposed to answer two main research questions: What are the main expectations of Portuguese patients; What do they think of their National Health Service.

Through the current and past literature on the topic, it was possible to learn that governments face, in respect of healthcare management, a tridimensional challenge in an effort to reduce costs, achieve universal coverage and improve service quality. Additionally, it was possible to learn that quality can only be improved through a redesigning of the healthcare system towards a patient-centered culture that delivers more value, instead of more services. In order to achieve that, the study of patient expectations and the evaluation and report of patient satisfaction and service quality indicators assumes critical importance.

The review of the current health system characterized the NHS in Portugal as a universal, almost-free at point of use healthcare provision. Mostly funded by taxation, with 27% of total expenditure constituting out-of-pocket payments, major critics argued that the inequalities that subsists in access to healthcare are related to the double insurance coverage for some part of the population, a feature made possible by the various subsystems.

In a quest to learn more about patient expectations, it was discovered that these can be influenced by Social, Personal and Context components, with this last one highlighting that studying expectations in healthcare context is completely different than any other context given the specific emotional mindset of the patient. Regarding the effect of socio-demographic characteristics, the literature claimed that especially Age and Education affected patients' expectations and that the reasons for this phenomenon can be possibly traced back to value-theory as judgements are made in relation to a predetermined set of personal values. Despite this, the link between patients' expectations and patient satisfaction is a topic that arises much academic controversy with some studies claiming for a significant relationship and others demanding a more detailed investigation.

Based on the Thompson's Assimilation-Contrast theory, it was possible to learn that patients have an unconscious zone of tolerance that moderates the effect of expectations on satisfaction. Inside this zone of tolerance, initial perceptions tend to be adjusted to match expectations, thus resulting in small amounts of satisfaction or indifference. Outside this zone of tolerance, the opposite happens with patients reporting exaggerated levels of high satisfaction or dissatisfaction because initial perceptions were well above or below preconceived expectations. Finally, the literature also provided a segmentation of patient profiles based on their expectations, classifying patients into 4 main groups: The Hedonists, patients that view healthcare as a shopping experience by taking pleasure in visiting the doctor even with they don't need it and buying health products; The Functional, representing those patients who demand more quickness and effectiveness in defense of a more practical service; The Trustful, patients that highly value the relationship with their doctors and medical staff, highly trusting in the healthcare system; The Critical (Consumerist), representing the percentage of patients who behaves as the traditional supermarket shopper by being very price sensitive and designing cost-optimization approaches.

In the empirical analysis run by this thesis, it was possible to find that most of the participants were in line with the Functional profile behaviors, with results of these profile being higher on average than the others. This could mean that, at least in this sample, respondents prefer a quick, effective and practical service. Additionally, Trustful profile scores ranked 2nd on average results, also indicating that despite demanding practical service, participants also care about the relationship they have with their doctors and medical staff. Conversely, the Critical profile was the least popular among respondents, a discovery that seems to suggest that participants do not identify at all with the supermarket shopper profile in terms of healthcare.

Through the empirical analysis, it was also possible to confirm the literature statements that Age and Education affected expectations, with older participants being associated with higher scores on the Trustful profile and younger patients being associated with higher scored on the Functional profile. As stated before, highly educated patients tend to pursue more self-direction values, including Hedonism, so this can be a cause for the positive correlation found between Education and Hedonist results. Interestingly, besides the claim by the literature that gender had no significant effect in expectations, a positive correlation was found between being a woman and defending Trustful profile behaviors but, despite being consistent with public intuition, these results can be biased due to the high proportion of women in this study's sample.

At last, this study found no statistical evidence to ensure that a significant relation between different expectations and satisfaction existed, however, higher Trustful profile scores and lower Critical results were correlated with higher and lower Behavioral Intentions, respectively.

In addition to the study of expectations, this work was also interested in learning more about patient satisfaction. From the literature, it was discovered that this is an undefined concept with much controversy regarding its definition and measurability. In order to overcome this, it was necessary to look at the marketing literature where Oliver's disconfirmation theory was found declaring that a post-purchase satisfaction response is usually composed of two separate contributions, one cognitive (composed by expectations, disconfirmation and performance attributes) and one affective possibly justifying why expectations alone, according to other studies, seem to explain only a small percentage of a given satisfaction response. Additionally, the concept of perceived service quality and its relationship with satisfaction was discovered and studied through the model proposed by Dagger. In this model, the author designed a method to evaluate service quality in the healthcare context by creating a total of 9 variables distributed through 3 main dimensions as well as a questionnaire designed to assess each one of these variables.

This model was useful in the data collection process of this study and through empirical analysis, it was concluded that participants evaluated the public provision of healthcare as satisfactory (with none of the variables achieving an average result of 15). Service satisfaction, Perceived Service Quality and Behavioral Intentions scored average results of 13, 11 and 14, respectively. In the detailed analysis, it was possible to conclude that Interpersonal Quality and Technical Quality were the better ranked dimensions of care (with average results of 13 and 14, respectively) and that Environmental Quality should receive more attention with participants ranking the variable with 10 out of 20 on average. Specifically, Relationship, a variable intended to measure the closeness and strength of the relationship between user and medical staff, was classified as negative (9 out of 20) and Waiting Time had the second lowest result on average. Regarding the influence of socio-demographic characteristics, the empirical research in this study confirm the statements made by the literature that older participants tend to be more satisfied and are more likely to comply to treatment and, additionally, at least in this sample, those living in Coimbra reported higher satisfaction than those living elsewhere. On the other hand, no empirical evidence was found that Education, Gender or Income had effect on satisfaction results, contrary to what was described by the literature.

Limitations of this study

This research has lots of limitations and assumptions, therefore interpretations as well as generalization of results must be done taking into account the context, sample and possible biases of this study.

First of all, the sampling method used was the most convenient given the time frame to conclude this study, thus it was not the most appropriate and not the ideal one, resulting in a non-random and non-representative sample of the Portuguese population. Therefore, it is impossible to know whether these results reflect the opinion of Portuguese patients or not. However, they represent the opinion of this sample and can indicate some general tendencies that could be further investigated in future studies.

Secondly, the methodology used a distributed survey to general population asking for them to evaluate satisfaction levels and behaviors based on their memories of past events. This can originate recall bias as human memory is not perfect and responses might reflect influences from the media and public discussions. This leads us to another important assumption in this study, one that considers that participants had no special reason to disguise their opinions and that they knew beforehand their satisfaction and expectation levels in order to report them honestly.

Thirdly, and even though attention tests were designed to exclude participants that answered randomly, the length of the survey as well as its repetitiveness might have caused some random responses in a hurry to finish the survey.

Finally, the assessment of expectations, unlike the assessment of satisfaction, was not done by using a pre-constructed and tested questionnaire found in the literature, instead, questions were built based on descriptions of a given patient profile. Validity of this part of the questionnaire was therefore not tested and this could be a case for biased results.

Recommendations and Future Research

Hopefully, this study will contribute to the realization by the Portuguese Ministry of Health, as well as private health providers, of the importance of studying patients' expectations and satisfaction at national level. Not only the results will give feedback towards the patient's opinions and satisfaction with the healthcare provision, they also can be especially useful for identifying possible areas of improvement that can lead to enormous advances in quality and efficacy. Additionally, satisfaction surveys can add transparency to the whole healthcare system. By publicly reporting whose institutions had the higher satisfaction levels, the government is enabling a more informed decision-making process to Portuguese patients. Participants in this research highlighted a preference for a more practical health system as well as a better relationship with their doctors and medical staff, a more serious investigation on this subject could contribute to the confirmation of these results and to an identification of possible areas to improvement. Additionally, assuming that the satisfaction levels reported here can be generalized to the Portuguese population, the problem from the user perspective is not in technical quality of healthcare but in the environmental quality and administrative quality of the healthcare facilities. Designing strategies to improve not only the environment in hospitals but also the efficiency in waiting time can lead to happier patients.

In terms of further research, the main advice is to replicate this study at national level, with a representative sample of the population to confirm the results obtained. Only then it will be possible to conclude with certainty what needs to be improved in order to promote satisfaction with the healthcare system. Additionally, a separate study of expectations would make sense in order to know in more detail if the patients' profiles used in this study actually reflect the expectations of Portuguese patients. Also, in the expectations domain, a study can be conducted to investigate the evolution of expectations during the interaction with the medical staff and, in addition, an experiment can be run to assess the true effect of expectations on a given satisfaction report. Regarding patient satisfaction, a census or a more comprehensive study can be implemented at national level to properly discover the opinions and main sources of dissatisfaction with the National Health Service. Experiments can also be designed to test how patient satisfaction changes in response to a certain treatment like, for example, different environmental conditions or different doctor behaviors. Finally, the study of waiting times and its reduction could be especially valuable for understanding how can health providers be more efficient and reduce the burden of waiting.

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Appendix

Figure 1A – Sample distribution by Age Group (source: Qualtrics)

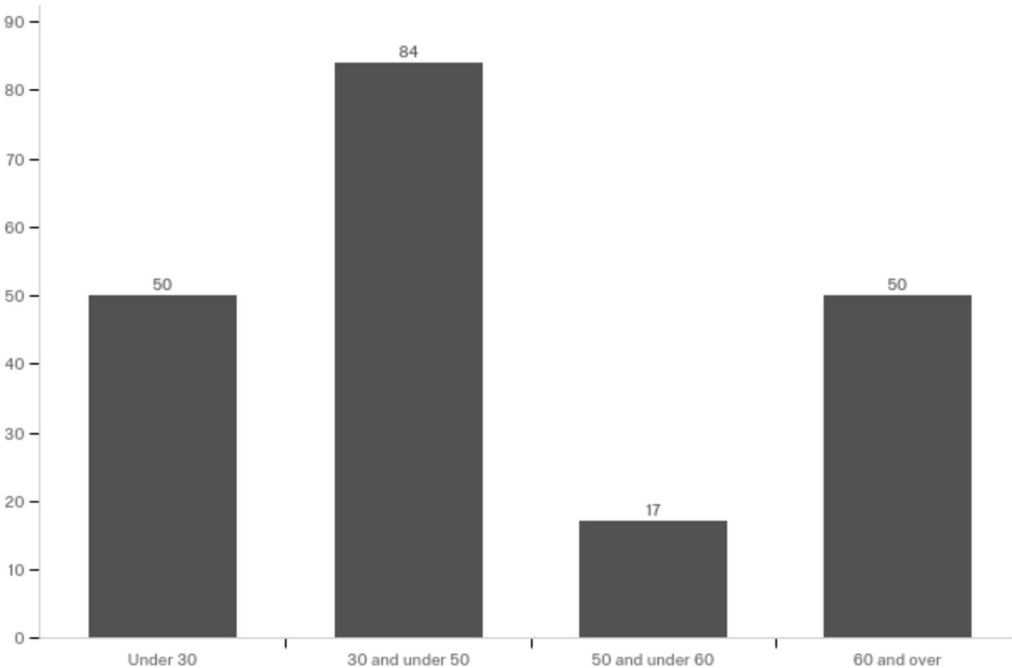


Figure 2A – Sample distribution by Income Type (source: Qualtrics)

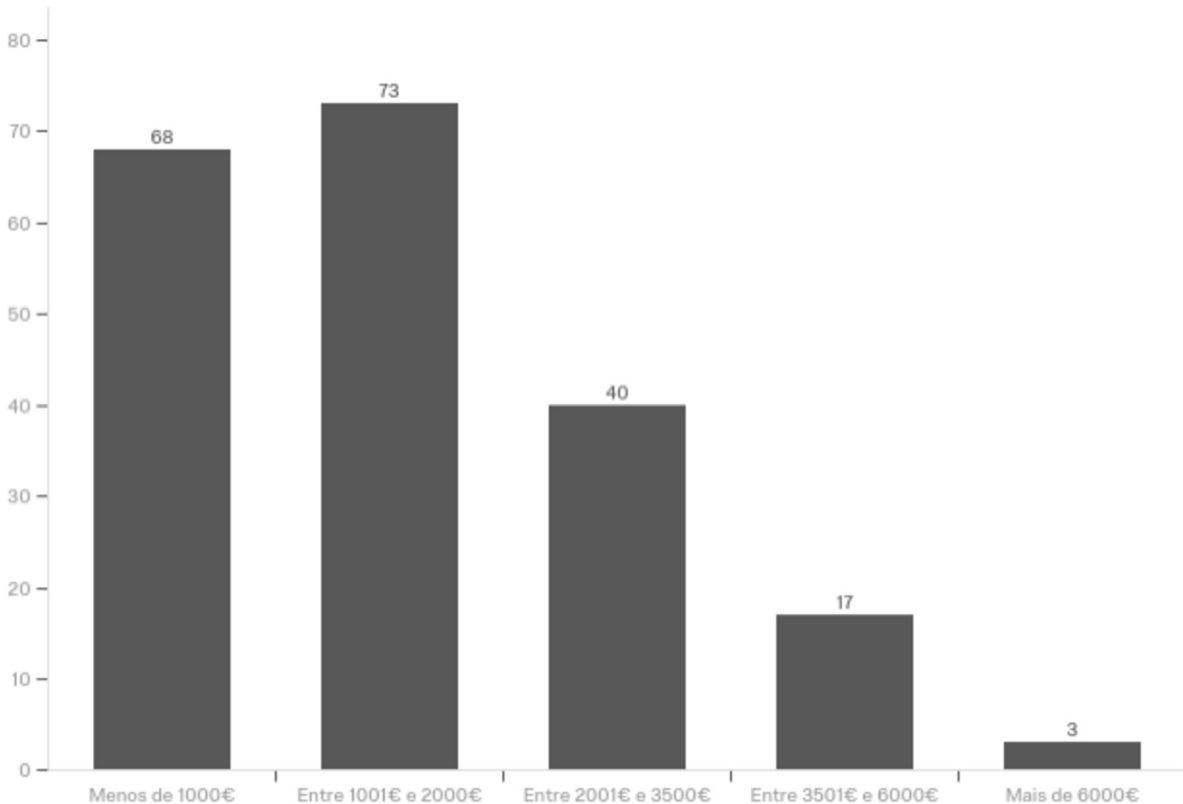


Figure 3A – Sample Distribution by Education Level (source: Qualtrics)

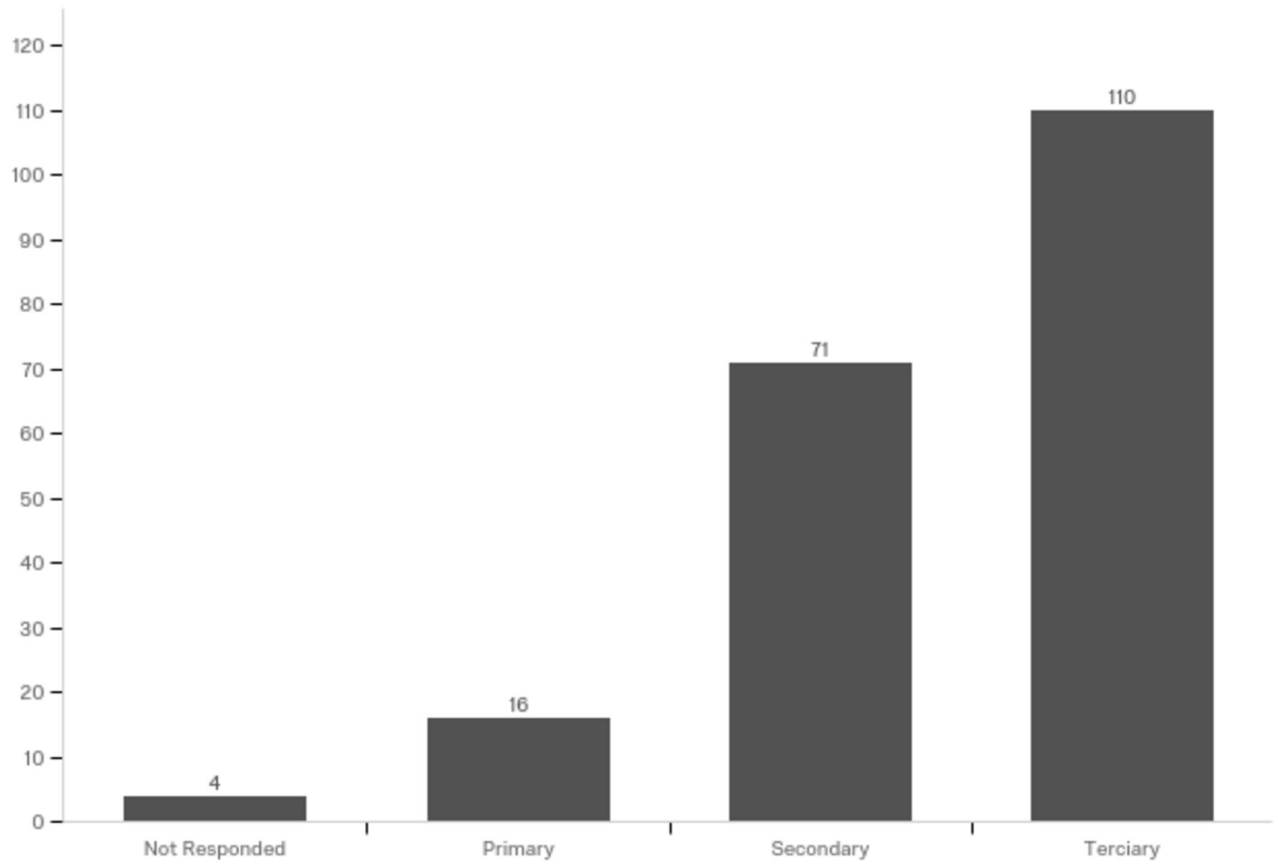


Figure 4A – Distribution of the 4 Patient Profile Results

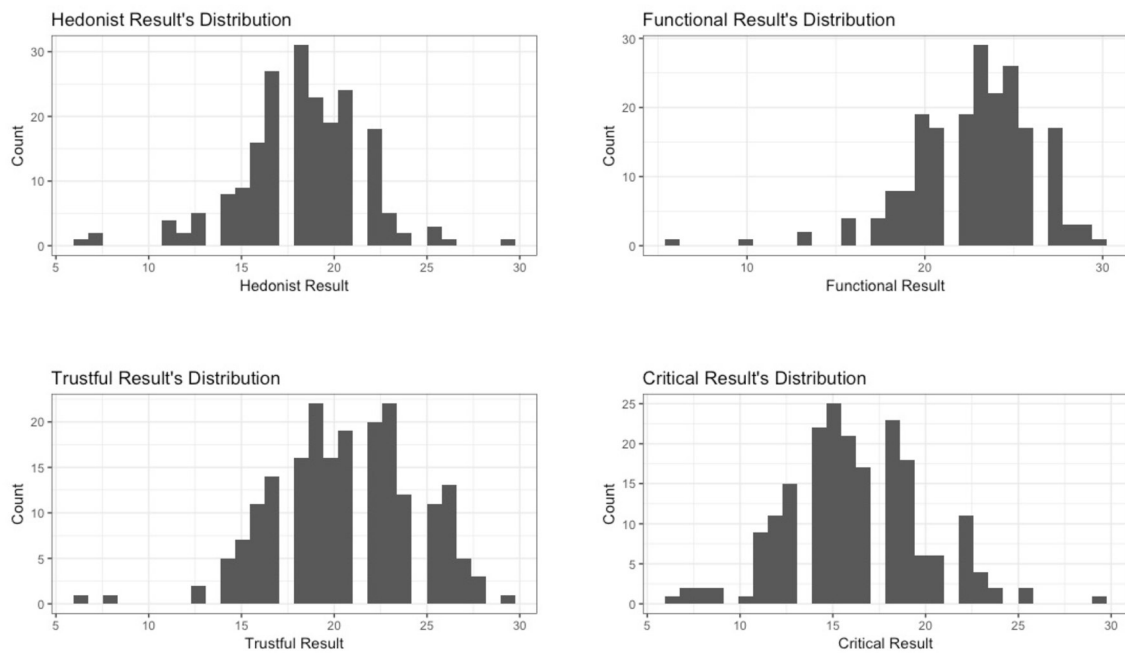


Figure 5A – ANOVA Test Result – Age and Trustful Result

H0: Different Age Groups have equal Trustful Results on the average

H1: Different Age Groups have different Trustful Results on the average

```

                Df Sum Sq Mean Sq F value  Pr(>F)
as.factor(AgeGroup2)  3  603.6  201.21  17.66 3.42e-10 ***
Residuals            197 2244.6   11.39
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Pearson's product-moment correlation

```

data: Age and TrustfulResult
t = 7.4024, df = 199, p-value = 3.69e-12
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.3486823 0.5666130
sample estimates:
      cor
0.4646548

```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Age, Trustful Result) is estimated at 0.464.

Figure 6A – ANOVA Test Result – Age and Functional Result

H0: Different Age Groups have equal Functional Results on the average

H1: Different Age Groups have different Functional Results on the average

```

                Df Sum Sq Mean Sq F value  Pr(>F)
as.factor(AgeGroup2)  3   135   44.98   3.993 0.00864 **
Residuals            197  2219   11.26
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Pearson's product-moment correlation

```

data: Age and FunctionalResult
t = -3.7305, df = 199, p-value = 0.0002492
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
-0.3805901 -0.1215681
sample estimates:
      cor
-0.2556615

```

The null hypothesis is rejected at 0.01 significance level, correlation among variables (Age, Functional Result) is estimated at -0.255.

Figure 7A – ANOVA Test Result – Education and Hedonist Result

H0: Different Education Levels have equal Hedonist Results on the average

H1: Different Education Levels have different Hedonist Results on the average

```

                Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Education)  1  58.1   58.15   5.364 0.0216 *
Residuals           195 2113.7   10.84
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
4 observations deleted due to missingness

```

Pearson's product-moment correlation

```

data: Education and HedonistResult
t = 2.3161, df = 195, p-value = 0.02159
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.02438294 0.29663164
sample estimates:
cor
0.1636209

```

The null hypothesis is rejected at 0.01 significance level, correlation among variables (Education, Hedonist Result) is estimated at 0.163.

Figure 8A – ANOVA Test Result – Income and Trustful Result

H0: Different Income Levels have equal Trustful Results on the average

H1: Different Income Levels have different Trustful Results on the average

```

                Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Income)  2  52.8   26.41   2.272 0.106
Residuals         198 2301.2   11.62

```

Pearson's product-moment correlation

```

data: Income and FunctionalResult
t = -2.056, df = 199, p-value = 0.04109
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
-0.277086560 -0.005946353
sample estimates:
cor
-0.1442224

```

Despite the significant and negative correlation, there was not enough statistical evidence to reject the null hypothesis at the defined minimum of 0.05 significance level.

Figure 9A – ANOVA Test Result – Gender and Trustful Result

H0: Different Gender groups have equal Trustful Results on the average

H1: Different Gender groups have different Trustful Results on the average

```
              Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Gender)  1  114.1   114.07   8.302 0.00439 **
Residuals        199 2734.1    13.74
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Pearson's product-moment correlation

```
data: Gender and TrustfulResult
t = 2.8814, df = 199, p-value = 0.004394
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.06348721 0.32939535
sample estimates:
      cor
0.2001236
```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Gender, Trustful Result) is estimated at 0.2.

Figure 10A – t-test Result – Service Satisfaction and Hedonist Results

H0: Participants with different Hedonist results have equal Satisfaction scores on the average

H1: Participants with different Hedonist results have different Satisfaction scores on the

Welch Two Sample t-test

```
data: ServiceSatisfaction by Hedonist
t = 0.22134, df = 196.11, p-value = 0.8251
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.8306999 1.0407339
sample estimates:
mean in group 0 mean in group 1
 13.24490      13.13988
```

average

Despite the significant and positive correlation, there was no statistical evidence to reject the null hypothesis.

Figure 11A –t-test Result – Service Satisfaction and Trustful Results

H0: Participants with different Trustful results have equal Satisfaction scores on the average

H1: Participants with different Trustful results have different Satisfaction scores on the

```
Welch Two Sample t-test

data: ServiceSatisfaction by Trustful
t = -1.9336, df = 193.54, p-value = 0.05462
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.84034974  0.01824732
sample estimates:
mean in group 0 mean in group 1
    12.71429      13.62534
```

average

Despite the significant and positive correlation, there was no statistical evidence to reject the null hypothesis.

Figure 12A –t-test Result – Service Satisfaction and Critical Results

H0: Participants with different Critical results have equal Satisfaction scores on the average

H1: Participants with different Critical results have different Satisfaction scores on the average

```
Welch Two Sample t-test

data: ServiceSatisfaction by Critical
t = 1.9166, df = 181.83, p-value = 0.05685
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.02690166  1.85315649
sample estimates:
mean in group 0 mean in group 1
    13.60360      12.69048
```

Despite the significant and negative correlation, there was no statistical evidence to reject the null hypothesis.

Figure 13A –t-test Result – Perceived Quality and Trustful Results

H0: Participants with different Trustful results have equal Perceived Quality scores on the average

H1: Participants with different Trustful results have different Perceived Quality scores on the average

Welch Two Sample t-test

```
data: PerceivedServiceQuality by Trustful
t = -1.8675, df = 190.02, p-value = 0.06337
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.89504705  0.05180687
sample estimates:
mean in group 0 mean in group 1
 11.44361      12.36523
```

Despite the significant and positive correlation, there was no statistical evidence to reject the null hypothesis.

Figure 14A –t-test Result – Perceived Quality and Hedonist Results

H0: Participants with different Hedonist results have equal Perceived Quality scores on the average

H1: Participants with different Hedonist results have different Perceived Quality scores on the average

Welch Two Sample t-test

```
data: PerceivedServiceQuality by Hedonist
t = 0.53203, df = 198.36, p-value = 0.5953
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.7071307  1.2296647
sample estimates:
mean in group 0 mean in group 1
 12.05442      11.79315
```

Despite the significant and positive correlation, there was no statistical evidence to reject the null hypothesis.

Figure 15A –t-test Result – Behavioral Intentions and Hedonist Results

H0: Participants with different Hedonist results have equal Behavioral Intentions on the average

H1: Participants with different Hedonist results have different Behavioral Intentions on the average

```
Welch Two Sample t-test

data: BehavioralIntentions by Hedonist
t = 0.034742, df = 198.72, p-value = 0.9723
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.9212042  0.9542460
sample estimates:
mean in group 0 mean in group 1
 14.06414      14.04762
```

Despite the significant and positive correlation, there was no statistical evidence to reject the null hypothesis.

Figure 16A –t-test Result – Behavioral Intentions and Trustful Results

H0: Participants with different Trustful results have equal Behavioral Intentions on the average

H1: Participants with different Trustful results have different Behavioral Intentions on the

```
Welch Two Sample t-test

data: BehavioralIntentions by Trustful
t = -2.0546, df = 191.34, p-value = 0.04127
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.9096721 -0.0389731
sample estimates:
mean in group 0 mean in group 1
 13.54243      14.51675
```

```
Pearson's product-moment correlation

data: BehavioralIntentions and TrustfulResult
t = 4.0972, df = 199, p-value = 6.084e-05
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1461635 0.4018012
sample estimates:
cor
0.2789162
```

average

The null hypothesis was rejected at 0.05 significance level. Correlation among variables (Behavioral Intentions, Trustful Result) is estimated at 0.278.

Figure 17A –t-test Result – Behavioral Intentions and Critical Results

H0: Participants with different Critical results have equal Behavioral Intentions on the average

H1: Participants with different Critical results have different Behavioral Intentions on the

```
Welch Two Sample t-test

data: BehavioralIntentions by Critical
t = 2.379, df = 179.94, p-value = 0.0184
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.1938749 2.0793371
sample estimates:
mean in group 0 mean in group 1
 14.56518      13.42857

Pearson's product-moment correlation

data: BehavioralIntentions and CriticalResult
t = -2.1193, df = 199, p-value = 0.03531
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.28117626 -0.01038133
sample estimates:
      cor
-0.1485626
```

average

The null hypothesis was rejected at 0.05 significance level. Correlation among variables (Behavioral Intentions, Critical Result) is estimated at - 0.148.

Figure 18A – Distribution of Main Satisfaction variables

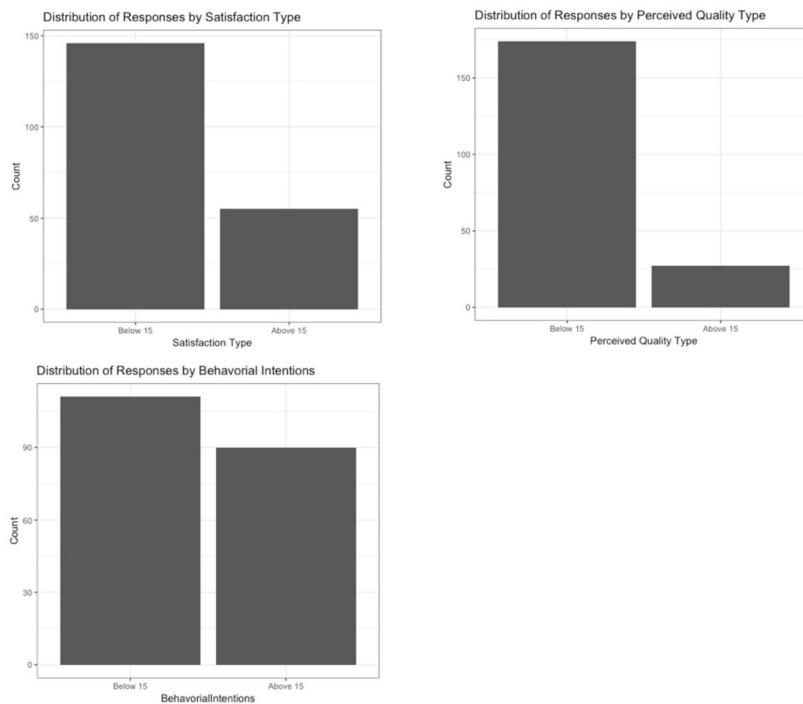


Figure 19A – ANOVA Test Result – Age and Satisfaction Scores

H0: Different Age groups have equal Satisfaction scores on the average
H1: Different Age groups have different Satisfaction scores on the average

```

              Df Sum Sq Mean Sq F value Pr(>F)
as.factor(AgeGroup2)  3  128.4   42.81   3.992 0.00866 **
Residuals           197 2112.4   10.72
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Pearson's product-moment correlation

```

data: Age and ServiceSatisfaction
t = 3.4594, df = 199, p-value = 0.0006621
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1031824 0.3645542
sample estimates:
      cor
0.238176

```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Age, Service Satisfaction) is estimated at 0.238.

Figure 20A – ANOVA Test Result – Age and Perceived Service Quality

H0: Different Age groups have equal Perceived Service Quality results on the average

H1: Different Age groups have different Perceived Service Quality results on the average

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
as.factor(AgeGroup2)	3	62.1	20.70	1.714	0.165
Residuals	197	2379.8	12.08		

Pearson's product-moment correlation

```
data: Age and PerceivedServiceQuality
t = 2.1595, df = 199, p-value = 0.03201
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.01319901 0.28376948
sample estimates:
      cor
0.1513173
```

Despite the significant and negative correlation, there was not enough statistical evidence to reject the null hypothesis at the defined minimum of 0.05 significance level.

Figure 21A – ANOVA Test Result – Age and Behavioral Intentions

H0: Different Age groups have equal Behavioral Intentions scores on the average

H1: Different Age groups have different Behavioral Intentions scores on the average

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
as.factor(AgeGroup2)	3	159.9	53.29	4.982	0.00236 **
Residuals	197	2107.4	10.70		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Pearson's product-moment correlation

```
data: Age and BehavioralIntentions
t = 3.7666, df = 199, p-value = 0.0002179
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1240012 0.3827006
sample estimates:
      cor
0.2579688
```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Age, Service Satisfaction) is estimated at 0.257.

Figure 22A – ANOVA Test Result – Location and Satisfaction Scores

H0: Participants living in different locations have equal Satisfaction scores on the average
 H1: Participants living in different locations have different Satisfaction scores on the

```

                Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Location)  1  66.4  66.40  6.076 0.0145 *
Residuals          199 2174.5  10.93
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
    
```

Pearson's product-moment correlation

```

data: Location and ServiceSatisfaction
t = 2.465, df = 199, p-value = 0.01455
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.03456232 0.30330299
sample estimates:
      cor
0.1721337
    
```

average

The null hypothesis is rejected at 0.01 significance level, correlation among variables (Location, Service Satisfaction) is estimated at 0.238.

Figure 20A – ANOVA Test Result – Location and Perceived Service Quality

H0: Participants living in different locations have equal Perceived Service Quality results on the average
 H1: Participants living in different locations have different Perceived Service Quality results on the average

```

                Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Location)  1  80.8  80.80  6.81 0.00975 **
Residuals          199 2361.1  11.86
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
    
```

Pearson's product-moment correlation

```

data: Location and PerceivedServiceQuality
t = 2.6096, df = 199, p-value = 0.009753
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.04463337 0.31243378
sample estimates:
      cor
0.1819045
    
```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Location, Perceived Service Quality) is estimated at 0.181.

Figure 21A – ANOVA Test Result – Location and Behavioral Intentions

H0: Participants living in different locations have equal Behavioral Intentions scores on the average

H1: Participants living in different locations have different Behavioral Intentions scores on the average.

```
              Df Sum Sq Mean Sq F value Pr(>F)
as.factor(Location)  1  80.8   80.80    6.81 0.00975 **
Residuals          199 2361.1   11.86
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Pearson's product-moment correlation

```
data: Location and BehavioralIntentions
t = 3.4659, df = 199, p-value = 0.0006473
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.1036226 0.3649399
sample estimates:
      cor
0.2385957
```

The null hypothesis is rejected at 0.001 significance level, correlation among variables (Age, Behavioral Intentions) is estimated at 0.238.