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MEASURING THE ASSOCIATION OF PERCEIVED SERVICE QUALITY AND HEALTH-RELATED QUALITY OF LIFE: THE CASE OF A PORTUGUESE LONG-TERM CARE UNIT

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Abstract

Demand in the healthcare sector has been growing and currently represents a highly competitive market with increasingly demanding patients. Demographic changes in the Portuguese context are creating significant challenges to this sector and service quality may be a paramount competitive factor for the success of these organisations.

The goal of this dissertation is to understand the perceived service quality and health-related quality of life from the perspective of patients undergoing long-term care treatments.

Based on a case study approach, and aiming to achieve the proposed goal, two questionnaires were applied to patients: one based on the SERVPERF instrument, proposed by Cronin and Taylor (1992), and a second one consisting of the EQ-5D-3L, proposed by the EuroQol Group (1990). The latter was applied at two different moments, at the beginning of the treatment and 30 days after. During the second data collection moment, the SERVPERF based instrument was also applied. This investigation not only intended to study the existence of a relationship between perceived service quality and health-related quality of life but also to analyse patients' satisfaction and the possible differences between patients under public and private networks at the same unit.

Results showed good reliability of the SERVPERF dimensions and the Satisfaction construct. It was identified that some patients' characteristics – residence and living arrangement – have influence in the perceived service quality and patients' satisfaction. It was also identified that there is a positive and significant relationship between perceived service quality and the patients' satisfaction. When evaluating the association with the perceived service quality and the health-related quality of life, it was disclosed that there is a slight relationship but non-significant between them. As no significant differences were found regarding the perceptions of patients among different networks (public or private), it is possible to state that the unit analysed does not differentiate the service supplied to patients based on where they come from (network).

Keywords: Service Quality; Health-related Quality of Life; EQ-5D; Long-Term Care

JEL Classification: I110; Y40

Resumo

O sector da saúde tem crescido e atualmente é um mercado bastante competitivo e com pacientes cada vez mais exigentes. Mudanças sociodemográficas em Portugal estão a criar grandes desafios a este sector e a qualidade do serviço pode ser um fator competitivo primordial para o sucesso destas organizações.

O principal objetivo desta dissertação é entender como é que a qualidade do serviço e a qualidade de vida relacionada à saúde são percecionados pelos pacientes em tratamentos de cuidados continuados.

De forma a concretizar este objetivo, foram aplicados dois questionários aos pacientes. O SERVPERF, proposto por Cronin and Taylor (1992), e o EQ-5D-3L, proposto pelo Grupo EuroQol (1990). Este último foi aplicado em dois momentos diferentes, no início do tratamento e 30 dias depois. Durante o segundo momento de recolha de dados, o instrumento SERVPERF também foi aplicado. Esta investigação não só proponha analisar a associação entre estas duas dimensões como, também, analisar a satisfação dos pacientes e as possíveis diferenças entre os pacientes na rede pública e privada na mesma unidade.

Os resultados confirmaram boa confiabilidade do SERVPERF e do constructo da Satisfação. Foi identificado que algumas características dos pacientes – residência e se viviam sozinhos antes do hospitalização – têm influência na forma como estes percecionam o serviço e no seu nível de satisfação. Verificou-se, também, uma relação positiva e significante entre qualidade percebida do serviço e o nível de satisfação dos pacientes. Ao analisar a associação entre a qualidade percebida do serviço e a qualidade de vida relacionada com a saúde, verificou-se uma leve relação mas não significativa. Uma vez que não foram encontradas diferenças significativas entre as perceções dos pacientes em diferentes redes (pública ou privada), é possível afirmar que a unidade analisada não diferencia o serviço prestado aos pacientes com base na sua origem (rede).

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1. Introduction

This first chapter aims to contextualize the present investigation. Firstly, it is presented the main purpose of this dissertation, the general and specific objectives are defined as well as the research questions. Additionally, the generic methodology to be used regarding this context will also be described, concluding with a brief explanation concerning each chapter of this dissertation.

1.1. Contextualization

In the last few decades, the service sector has become increasingly relevant and it shows heavily in the structure of the Portuguese economy. From data regarding the year of 2016, the service sector represents 75,4% of the GVA (Gross Value Added) and employs 68,6% of the active population in the country (INE, 2017).

In the same way, the number of services offered to customers and the emergence of new competitors to provide those services is also increasingly higher (Grönroos, 2001). Therefore, according to this author, the quality of the service is considered a differentiation factor and, consequently, a factor of success for these organizations, given that it contributes for their competitive advantage.

To guarantee that the service provided matches or exceeds the expectations of the customers, it is fundamental that operations' managers understand their customers (Johnston *et al*., 2012). Following this perspective, in an attempt to deliver what is expected by the majority of customers, it is relevant that they are satisfied with the service. Actually, due to the fact that service quality and satisfaction are often associated, various authors have defended that service quality can improve customer satisfaction and, consequently, retain customers (Yip *et al*., 2011; Tam, 2004).

The concept of quality has been conceptualized in several contexts and alternative measures have been proposed for the understanding of service quality. To do so, it is believed that the SERVPERF questionnaire is one of the most widely advocated and applied service quality scales (Lien, 2017; Jain e Gupta, 2004), becoming increasingly important for several industries such as

fashion retail (Islam *et al*., 2012), banking (Olorunniwo and Hsu, 2006), hair dressing industry (Chen and Guo, 2014), or healthcare (Kim and Oh, 2012), just to name a few areas of application.

Within the service sector, the health sector in particular has been growing and currently represents a highly competitive market, where there is a high-pressure to provide services with higher quality levels (Zarei *et al*., 2012).

In Portugal, the National Health Service (*Sistema Nacional de Saúde* – SNS) has suffered several changes and different adaptations at regional and local levels (Ministry of Health, 2009). In a thorough research made by Deloitte (2011), the main problems of this sector were identified as: poor financial support; inadequate human resources planning; inappropriate strategic management and lack of accurate information.

With these challenges tending to condition and hamper the provision of a sustainable service, the evaluation of the service quality provided by the health sector becomes even more important. Within this setting, the patients' perspective, as these are the final customers of the service, is more and more considered as a key indicator of quality and it is essential to highlight the importance of the judgment by those patients concerning the quality of health services (Castle *et al*., 2005).

Although the health sector quality is already a topic of interest to many researchers, there are only a few researches regarding the Portuguese context, such as Duarte *et al.* (2014). Despite its importance, issues such as the quality of life of the population are topics that remain understudied. Issues in evaluation and continuous improvement of quality in the health sector have been of great importance in Portugal. The National Health Plan (Direção Nacional de Saúde, 2015), now extended until 2020, is an important example that emphasizes health improvement, well-being of the population and reducing health inequalities. Regarding health quality, improvement means "*doing everything, on a daily basis, to provide an effective and safe care service that satisfies the citizens and corresponds, as far as possible, to their needs and expectations*" (National Health Plan, 2015:16).

The prevalence of chronic diseases is increasing in Portugal and significant changes – such as the increase in both female employment and average life expectancy and also the demographic aging of population – are creating great challenges to the healthcare sector (Noronha, 2017).

Responding to this context, the National Network for Long-Term Care (Rede Nacional de Cuidados Continuados Integrados, RNCCI) was created aiming to provide long-term care to people with dependency, based on an integrated and articulated model of health and social security that involves the collaboration of several social or private partners (Finance, Labour, Solidarity and Social Security and Health, 2017).

In 2017, 1788 patients were on the national waiting list to receive long-term care, an increase of 42% regarding the previous year (TVI, 2017). According to the same source, the most concerning values are in the region of Lisbon, where 684 patients are waiting for a vacancy. By the end of that year, an increase of 534 beds occurred in the system (TVI, 2017). However, for one of the most aging population of Europe (INE, 2017), where 85% of long-term care patients are older people, this increase in capacity is still not enough.

Long-term care became a trending topic lately, it is always under the scope of media, regarding its accessibility (TVI, 2017) or even about its professionals (Público, 2018), making it a topic of increasing relevant interest. Nowadays, it is crucial to proceed to the evaluation of its current status and promote the development of a competent network among all patients' needs, to cover all diversity and clinical complexities (National Health Service, 2018). To accomplish this, measurement and improvement of patients' health-related quality of life, it must be accompanied with the evaluation of the perceived quality and patients satisfaction with the service received to better understand the potential improvements.

When evaluating the quality of life, it is possible to highlight the EQ-5D questionnaire, a standardized instrument for measuring generic health status that can be used as a complement for existing health-related quality of life (HRQoL) measures (Ferreira, 2016).

The obvious importance of long-term care services, along with the lack of previous studies concerning the health-related quality of life, provides a research opportunity. Although several studies can be found in evaluating service quality in the healthcare sector, to the best of our knowledge, there are no studies so far that jointly analyse perceived service quality and health-related quality of life.

1.2. General Objective

Taking into consideration what was previously mentioned concerning the motivation for the development of this study, its main purpose is to evaluate the Perceived Service Quality in a Portuguese Long-Term Care unit, from the perspective of its patients, and its association with Health-related Quality of Life.

1.3. Specific Objectives

Taking into account the main purpose of this dissertation, in order to address it, more specific objectives are defined:

O1. Evaluate patients' perception of quality of the services provided by the long-term care unit;

O2. Evaluate health-related quality of life, as perceived by patients;

O3. Analyse the strength of the association between perceived quality and satisfaction with the service received by the long-term care unit;

O4. Evaluate the strength of association between the health-related quality of life and the perceived service quality;

O5. Compare the perceived service quality and the health-related quality of life of patients receiving long-term care in public and private networks;

O6. Propose managerial recommendations to service delivery in the long-term care unit to improve perceived service quality and health-related quality of life.

1.4. Research Questions

According to the objectives previously defined, the following research questions are formulated:

Q1. What is the patients' perception about both health-related quality of life and service quality provided by the Long-term Care Unit?

Q2. Is there an association between the perceived service quality and the level of satisfaction with the service received?

Q3. Is there an association between health-related quality of life and perceived service quality?

Q4. Are there differences in the perceived service quality and health-related quality of life between patients receiving long-term care from public or private networks?

Q5. Which managerial recommendations in the service delivery can improve the perceived service quality and the perceived health-related quality of life?

1.5. Research Methodology

Regarding the characteristics inherent in such investigation, literature suggests the use of Case Study as research method (Yin, 2009). This methodology has been widely described (Yin, 2014; Voss *et al.*, 2002; Eisenhardt, 1989) and defended as a great contribution to the knowledge of holistic and meaningful real-life events (Yin, 2009).

In order to achieve the conclusion of this case study, after understanding the literature and contemplate previous studies and respective methodology, the appropriate instruments will be conducted to cover the evaluation of perceived service quality, patients' satisfaction and health-related quality of life.

Then, data from the selected instruments will provide information that will allow investigating if there is an association between the health-related quality of life and the perceived service quality, inputting to brand new knowledge in healthcare service in the Portuguese healthcare reality. Collected data will be analysed resorting to the SPSS software.

1.6. Scope

In order to achieve the previously mentioned objectives, it is convenient to establish the study boundaries. The research intents to evaluate service quality and health-related quality of life in one specific unit – Hospital do Mar, Cuidados Especializados de Lisboa. Considering the dimension and implications of both questionnaires, as well as the conditions of patients under long-term care, the most adjusted way to operationalize data collection is in person with a face-to-face relation. The study will be restricted to patients receiving long-term care under convalescence and geriatrics treatments. The purpose of having a more focused research is to avoid the possible presence of healthcare services that are too different from each other, which would make the upcoming conclusions about this topic less precise.

1.7. Global Structure

Under the objectives previously defined, the present research will be divided into five main chapters:

1. Introduction: for this first chapter, fundamental guidelines were defined through the explanation about the context of the market and the main motivation to conduct this investigation. Here, it is possible to understand the main purpose where the general and specific objectives are disclosed, research questions formulated, an explanation about the methodology and the scope of the study.

2. Literature Review: this chapter is mainly about providing the theoretical background on existing literature that supports the subject of the present research. It will begin with the explanation of service quality followed by its relationship with customer satisfaction, then will be described the main existing methods, including both SERVQUAL and SERVPERF. The followed topics will concern the healthcare sector: introduction to the health-related quality of life and, subsequently, how to measure presenting the instruments, such as the EQ-5D and ICECAP.

3. Methodology: this one will be initiated with the introduction to long-term care services and the description of the unit under study. Then, will be presented the research hypotheses to be

tested, the selected instruments for the data collection and the independent variables to be used. Additionally, the sample under study will also be identified and a description regarding the statistical technique to be used.

4. Results: for this fourth chapter, the results obtained from the collected data, will be presented as well as some discussion through the use of different statistical techniques such as Cronbach's Alfa, hypotheses tests, and statistical correlation.

5. Conclusion: in this final chapter, the leading conclusions on this study will be disclosed. The research questions from the first chapter will be answered, through the conclusion about the results and the assessment of the literature presented on the second chapter. Then, limitations of the investigation and suggestions for further research will also be presented.

2. Literature Review

2.1. Introduction

This chapter has the purpose of addressing the thematic and, to do so, it is essential to understand and provide consistent theoretical background to support this research.

Firstly, concepts as service and service quality will be visited, followed by the discussion about the relationship between service quality and customer satisfaction. As measures of for these concepts, SERVQUAL and SERVPERF will also be examined. Then, an analysis through the healthcare context will be conducted, its measures and possible outcomes, resorting to the EQ-5D and ICECAP instruments.

Resorting to previous studies and analysing the application of these instruments, a bridge between perceived service quality and health-related quality of life will be addressed.

2.2. Service

The concepts of "service" and "services" are frequently used without any distinction. However, it is important to understand what distinguishes these two notions.

According to Johnston *et al.* (2012), *services* might be presented in several directions and be provided by several types of organizations, not only B2B (business-to-business) and B2C (business-to-consumer) organizations, but also by public and volunteer organizations. On the other hand, *service* is a more "complicated phenomenon" (Grönroos, 1988), capable of meaning different things in different contexts (Grönroos, 1988; Johnston and Clark, 2008).

Several researchers have been developing, over the years, recognized interpretations for the concept of services (Lau *et al.*, 2011). Fitzsimmons and Fitzsimmons (2004:12) defended services as a "*time-perishable, intangible experience performed for a customer acting in the role of co-producer*". For IMB (2006), services are the process where the provider and the client coordinate their work to allow them both to capture some value.

Service is a different concept, one that emerges from the comparison of Goods-Dominant Logic with Service-Dominant Logic (Vargo and Lusch, 2004). According to this perspective, Service is the application of knowledge and skills from one actor in the shape of goods or services (Vargo and Lusch, 2016)

Considering the mentioned coordination between the provider and the costumer, the concept of co-production was originally mentioned by the economist Elinor Ostrom, in the late 1970s. Since then, in the many attempts to establish the concept of service, value co-production is becoming an increasingly popular term in research.

Osborne *et al.* (2016) defined service co-production as the voluntary or involuntary involvement of public service users in any of the design, management, delivery and/or evaluation of public services. Service users do not choose to co-produce, it occurs whether they are aware of it or not, but it is an essential and inalienable core component of service delivery: it is not possible to have service delivery without it, due to the inseparability characteristic.

Customer value concept has also become essential for any business or market study, seen as the fundamental basis for all activities (Holbrook, 1994; Kumar and Reinartz, 2016; Eggert *et al.*, 2018). Smith (1981) introduced the terms "value in use" and "value in exchange". In his perspective, value has these two different meanings: can expresses the utility of some particular object and the power of purchasing others goods conveyed by the possession of that object, respectively.

This topic becomes significant because researchers are defending that "*the customer is always a co-creator of value, there is no value until an offering is used*" (Lusch *et al*., 2007:8). Once experience and perception are essential to value determination (Lusch *et al*., 2007), the conceptualization of co-production as a core characteristic of service delivery reframes the understanding of the delivery process and the user's role in measuring the outcomes (Radnor *et al*., 2014).

2.3. Service Quality

Inherent to the service concept comes along the definition of service quality. The latter has been quite challenging to researchers as well. There have been several attempts at creating a strong definition about this topic but it still remains largely undefined. In fact, improving quality is too often mentioned as an internal goal without any explicit references to what is meant by service quality (Grönroos, 1988). Goetsch and Davis (2000) have even mentioned that quality may be defined simply as something people cannot explain but customers are able to understand when are facing and experimenting with it.

While the substance and determinants of quality may be unclear, its importance to firms and consumers is totally unequivocal. Efforts in defining and measuring quality have come largely from the goods sector and the difference between goods and services (Garvin, 1983; Grönroos, 1984; Parasuraman *et al.,* 1985; Sweeney *et al.,* 1997; Yarimoglu, 2014), however, knowledge about quality of goods is not sufficient to understand service quality (Crosby, 1979). Due especially to its intangibility, a firm may find it more difficult to understand how consumers perceived service and service quality (Grönroos, 1988).

In order to achieve a better understanding about quality in services, well-documented characteristics of services must be acknowledged (Parasuraman *et al*., 1985). A whole range of characteristics of services have been suggested and discussed in the literature (Grönroos, 1982; Lovelock, 1983; Norman, 1983; Parasuraman *et al*., 1985). Four main characteristics have been regularly applied to services: the IHIP (which represents a contraction for Intangibility, Heterogeneity, Inseparability, and Perishability) characterization of services (Parasuraman *et al*., 1985; Fitzsimmons and Fitzsimmons, 2014), define services as:

- **Intangible** – services are about performance and efforts, thus, they cannot be seen or touched in the same way as goods. They also cannot be counted, measured, stored or verified before the act of sale, what turns even more difficult to guarantee the quality that is provided and the one consequently evaluated. Intangibility has been crucial for the distinction between goods and services, from where the follow characteristics emerge.
- **Heterogeneous** – heterogeneity of services concerns the difficulty in standardizing services (Edgett and Parkinson, 1993). The service performance is not the same for everyone, so its

output will result on the interaction between two elements: the provider and the customer (Fitzsimmons and Fitzsimmons, 2014). It is challenging to guarantee a uniform output, since service is deeply committed with variability.

- **Inseparable –** inseparability is mainly about the difficulty of having different moments for service production and service experience. This represents a concern because can be difficult to anticipate the service quality since they are directly delivered to the customer and, consequently, the quality is only perceived at the moment when the service is received. Since customer interaction is inherent to the process, this also makes it hard to the company in having a proper control of the quality of the service.
- **Perishable –** this characteristic emphasizes the fact that, unlike goods, services cannot be stored or stockpiled. The service itself perishes in the very instant of its performance. The customer experiences of the service at the moment of its provision but, regardless this, its effects may persist along time, depending on the type of service.

Although the IHIP characteristics are widely cited, there is still research in order to find new characteristics. Bordoloi (2014) joins Fitzsimmons and Fitzsimmons (2014) and established two more service characteristics:

- **Non-transferable Ownership –** customer has access to the service but has no possession over it, which means that, once provided, the service cannot be passed along to another person;
- **Customer Participation –** the customer is always involved, even if only to ask for the service.

Grönroos (2001) defends that the most important characteristic in services is actually the nature of its processes. When there is a service process, the process leads to cooperation between customer and service provider, hence the emergence of customer relationship and of the attempt to finding the best solution that satisfies his needs. As a consequence, service quality should be always defined and measured from the customer's perspective (Tam, 2004).

When understanding the concept of service quality, it is crucial that managers have a perception of its influence on business success and, according to this, how it can be improved (Johnston *et al*., 2012).

Therefore, the main question that arises is how the service is transformed into something that provides satisfaction, i.e., how the satisfaction-providing process is perceived by customers of services (Grönroos, 1982). Customers are becoming more demanding and competition further intensifies, which verifies that a high level of quality is no longer enough to guarantee firm's success and customer's loyalty, since the reality of customers' needs and desires changes over time.

2.3.1. Service Quality versus Customer Satisfaction

Service Quality and Customer Satisfaction are inherent concepts when relating with services and their relationship has been discussed among studies regarding service quality. To have an idea of causal direction between the two constructs, a review of definitions of these constructs is provided. Satisfaction can be described as the cognitive or emotional reaction that occurs in a person in response to service encounters (Parasuraman *et al*., 1988; Palmer, 2001), related to a specific transaction, whereas perceived service quality is the global judgment, or attitude, relating to the superiority of the service (Parasuraman *et al*., 1988). Management experts consider achieving customer satisfaction as one of the main tasks and priorities of any firm (Shahraki, 2014).

Some scholars defend that customer satisfaction might be an antecedent of service quality, however, further studies about the relationship between both constructs (Ravald and Grönroos, 1996; Parasuraman *et al*., 1985; Cronin and Taylor, 1992; Tam, 2004) are trying to demonstrate that service quality may be, in fact, the origin of customer satisfaction. This last perspective has been considered the most proper definition by these researchers.

Anderson *et al.* (1994) highlight two different conceptualizations regarding the definition of customer satisfaction. From the perspective of a specific transaction, customer satisfaction is viewed as a posterior judgment for a specific purchase occasion. On the other perspective, the cumulative customer satisfaction is an overall evaluation over time, which means that it is based on the total purchase experiences.

Through their study Anderson *et al.* (1994) also define three reasons for the difference between service quality and satisfaction:

- While service quality can be perceived without actual customer experience (Oliver, 1993), the level of satisfaction is only possible to measure when the customers have actually the experience with a service and then determine how satisfied they are with it;
- Customer satisfaction is dependent on a value. This value might be the ratio of perceived service quality relative to price or the ratio of received benefits to costs incurred. This way, customer satisfaction is also dependent on price unlike service quality, normally;
- Quality can be describe as the current customers' perception of a good or service and customer satisfaction is based on, beyond current experiences, all past and future or anticipated experiences.

Beyond researchers, entities such as hospitals administrators, insurance companies and community groups have recognized the value that feedback from patients can provide (O'Connor *et al.*, 1994). "*It is the patients' perspective that increasingly is being viewed as a meaning indicator of health services quality and may, in fact, represent the most important perspective*" (O'Connor *et al.*, 1994: 32).

Some scholars are still analysing if the customers' perspective can be truly considered as good judgments of quality or if their perceptions are too subjective. The healthcare sector is a complex one and too difficult to evaluate by the patient. Thus, in case that those patient-centred evaluations are to be effectively used in this sector, it is not reasonable to expect that patients will provide quality judgments based on technical aspects of the service. Instead, service providers should use and understand subjective criteria and then translate them into objective performance parameters (Andaleeb, 2001).

Moret (2007) reinforced the increasingly importance of the assessment of satisfaction in healthcare services. The author also mentions that continuous quality improvement, comparison of hospital performances, and accountability measures are some reasons why hospitals might want to measure patients' satisfaction. This also enables to identify a dysfunction in the healthcare unit and, consequently, to develop efforts in order to improve quality (Jenkinson *et al.*, 2002).

Through literature, it is possible to find several researches where the relationship between service quality and customer satisfaction is analysed, inclusive regarding the service in hospitals (Pai *et al.*, 2012; Kaushal, 2016; Georgiadou and Manditinos, 2017; Al-Neyadi *et al.*, 2018). Despite the differences, there is no doubt that these two constructs are connected and providing satisfaction is one of the main goals for any company. In fact, firms that achieve high customer satisfaction are also those that enjoy superior economic returns (Anderson, 1994).

2.3.2. Service Quality Measurement

Since the concept of service quality is quite hard to define, naturally measurement of its level will be even harder (Parasuraman *et al*., 1988).

From the previous attempts to define service quality, the one that has been the most widely accepted is the one where perceived service quality represents the discrepancy between customers' expectations and their perceptions of the service performance (Lewis and Booms, 1983; Gronroos, 1984; Parasuraman *et al*., 1988; Tam, 2004), however, this definition is also the one creating more argumentation about its measurement.

Parasuraman *et al*. (1985) mentioned that, regardless the type of service, consumers use basically similar criteria in the evaluation of service quality. Initially, those scholars identified 10 quality dimensions that, later (1988) were refined into only 5 final dimensions applicable to any market. According to Parasuraman *et al.* (1988: 23), those dimensions are as follows:

- **Tangibles** – measures the physical evidence of the service, "*physical facilities, equipment and the appearance of personnel*";
- **Reliability** – concerns the "*ability to perform the promised service dependably and accurately";*
- **Responsiveness** – includes the "*willingness to help customers and provide prompt service*";
- **Assurance** – is about "*knowledge and courtesy of the employees and their ability to inspire trust and confidence*";

- **Empathy** – regards the ability of "*caring, individualized attention the firm provides its customer*".

From the beginning, Parasuraman *et al*. (1985) has argued that there was a need and an opportunity to develop a standard instrument to measure consumers' service quality perceptions. Therefore, after identifying five dimensions, they created the first measurement instrument of service quality, the SERVQUAL questionnaire. It is possible to evaluate the perceived service quality in those dimensions using a 7-point Likert-like scale. It contemplates two criteria – customers' expectations and customers' perceptions – for each item in a total of 44 items. Despite its wide-ranging application for many managers and scholars (Jain and Gupta, 2004), this scale has been strongly criticized:

- The gap model is not solid enough; there is no evidence that customers evaluate the service quality in function of the difference between expectations and perceptions of performance (Carman, 1990; Grönroos, 1988; Cronin and Taylor, 1992);
- Expectations should be dynamic, once these are constantly suffering changes (Grönroos, 1988);
- The number of dimensions might be inappropriate. For some industries, the service quality is quite more complex than others therefore this number should be adjusted according to the industry (Carman, 1990);
- SERVQUAL may confound satisfaction with attitude (Babakus and Boller, 1992; Cronin and Taylor, 1992; Teas, 1993).

In a more operational perspective, there are some criticisms as well. Buttle (1996) argued that, due to the fact that expectations might be different across customers, its interpretation will be also different from customer to customer. For being composed with two sections – expectations and perceptions of the service – this questionnaire becomes too long, which might result in not finished or randomly answered questionnaires (Grönroos, 1988; Buttle 1996). Moreover, some discussion refers the SERVQUAL scale as specifically designed for the B2C context. The appropriateness of those dimensions to B2B context is also criticized and, from this question, was developed the INDSERV that specifically measures B2B service quality performance (Galahitiyawe and Musa, 2016).

Based on SERVQUAL and its criticisms, Cronin and Taylor (1992) developed the SERVPERF scale that establishes its evaluation only on customers' perceptions.

Methodologically this tool represents a modified version when compared to SERVQUAL: not only it is more efficient, since there is total of 22 items instead of the 44 proposed by the previous questionnaire; but, from an empirical perspective, SERVPERF has been superior in explaining the changes in the overall service quality measured with a single-item scale. Therefore, according to Jain and Gupta (2004), the SERVPERF scale is providing to be a more valid explanation of service quality.

Dabholkar *et al.* (1996) presented some concerns regarding the SERVPERF scale. They defend that SERVPERF questionnaire is not prepared to adapt to every service, but rather defined to evaluate the perception of quality of a pure service. Within this setting, they defended that both items and dimensions should be adapted to the service under analysis. However, Parasuraman *et al.* (1988), as well as Cronin and Taylor (1992), had already mentioned that its methods could suffer some adaptations considering the type of service that is intent to analyse, in order to be as close as possible to the characteristics of the specific services.

2.3.3 Service Quality in the Health Sector

The definition of healthcare service depends on the proponent's perspective (O'Connor *et al*., 1994), therefore, its definition and measurement have been a great challenge. Accurate measurement of service quality, as perceived by patients and former patients, has been described as indispensable for health care organizations (Gallagher, 1989). Actually, the conceptualization of quality of care – in the perspective of individuals, groups or organizations' meaning of quality – is an unexplored research area. It is crucial, then, to understand how quality is conceptualized in order to meet those perspectives (Wiig *et al.*, 2014).

In order to classify health and nursing care, patients' satisfaction has to be considered (Ali, 2018), since it is one of the most important aspects of healthcare evaluation (Al-Neyadi *et al.*, 2018). Andaleeb (2001) stated that the lack of attention given to patients' perceptions by healthcare providers might influence their confidence and subsequent behaviours. In fact, many patients actually may avoid the system or choose it only as a measure of last resort.

Patients' perspective become increasingly relevant when defining service quality. However, it is to notice that service is constantly shaped by physicians, nurses and other professionals during the service encounter and the way as patients tend to view service quality – from a more broad perspective – is increasing the difficulty in its definition (Ali, 2018). Several major acts can be identified in the hospital service: waiting time, nurse-patient encounters and doctor-patient relationship, food service or even the communication skills can be examples of indicators to consider (Ali, 2018). Hospitals administrators and managers are interested in obtaining information about how each of these services acts impact patient perceptions of service quality and satisfaction (Shostack, 1987). Patients' satisfaction continues to be a challenge for healthcare evaluation but a vital healthcare outcome and meaningful indicator to measure health services (Al-Neyadi *et al.*, 2018).

2.3.4. Previous Studies in Evaluating Service Quality and Patients' Satisfaction in the healthcare context

As mentioned before, there have been several studies with the purpose of evaluating the service quality, namely in the healthcare sector. In the majority of these cases, researchers' intention is not only to understand how the service quality is perceived by its users but also to verify which factors or dimensions may have an impact on that perception.

One of the first references regarding the perceived service quality in hospitals was made by Babakus and Mangold (1992), where the validity of the SERVQUAL scale for this sector was confirmed. Zarei *et al.* (2012) and Kipatci *et al.* (2014) focused their investigation on private hospitals context; Le and Fitzgerald (2012), Kaushal (2016) and Georgiadou and Maditinos (2017) in the public ones. Lately, Zamil *et al.* (2012), Mahapatra (2013), Li *et al.* (2015) and Al-Neyadi *et al.* (2018) had the purpose of comparing the perceived service quality in private and public hospitals. Lourenço *et al.* (2017) presents a different research that aimed to evaluate the service quality perceived by its employees.

The investigation of Andaleeb (2001) aimed at understanding patients' satisfaction. However, satisfaction is a construct strongly present on each of the previous mentioned researches, commonly associated with perceived service quality.

Regarding the specific context of this research, it is possible to find the study made by Pai *et al.* (2012). To the best of our knowledge, there are no more studies about perceived service quality in long-term care institutions.

To summarize, the mentioned studies are presented in Table 1:

Table 1 - Previous studies in evaluating service quality and patients' satisfaction in the healthcare sector

Reference	Perceived Service Quality	Satisfaction	Main Conclusions
Babakus and Mangold (1992)	✓ SERVQUAL	–	Concluded that adapted SERVQUAL is a valid and reliable instrument in the hospital environment, important in providing information to hospitals administrators.
Andaleeb (2011)	✓ SERVQUAL	✓	Focused on the importance of patients' satisfaction, suggesting items to evaluate it in the SERVQUAL scale.
Pai *et al.* (2012)	✓ SERVPERF	✓	Focus on long-term care institutions. One major suggest was considering other factors to improve satisfaction, such as increasing the accessibility and interaction of residents' family members.
Zamil *et al.* (2012)	✓ SERVPERF	✓	Comparison between public and private hospitals. Perceived service quality was higher in the private sector.
Le and Fitzgerald (2012)	✓ SERVPERF	✓	Evaluation and validation in using SERVPERF scale to measure perceived service quality and satisfaction in public hospitals.
Zarei *et al.* (2012)	✓ SERVQUAL	–	Research of perceived service quality in private hospitals. Validation of SERVQUAL as reliable and flexible instrument in this field.
Mahapatra (2013)	✓ SERVQUAL	–	Comparison between public and private hospitals, concluding that the differences founded among these systems were not great.
Kitapci *et al.* (2014)	✓ SERVQUAL	✓	Evaluation of the impact on service quality dimensions on satisfaction with the effect on word-of-mouth communications and repurchase intention in a university hospital.
Li *et al.* (2015)	✓ SERVQUAL	–	Comparison of perceived service quality at hospitals in different cities, concluding that this perception is not related to the geographic region or the size of the city.
Kaushal (2016)	✓ SERVQUAL	✓	Concluded that perceived service quality has a strong impact on overall satisfaction in evaluating a public hospital.
Georgiadou and Maditinos (2017)	✓ SERVPERF	✓	Applied in a public hospital, was concluded that the "clinic care process" is crucial to evaluate the patients' satisfaction and the overall quality of the hospital.
Lourenço *et al.* (2017)	✓ SERVPERF	–	This research was the evaluation of perceived service quality from the perspective of the health professionals, such as doctors, nurses and even technical assistants.
Al-Neyadi *et al.* (2018)	✓ SERVQUAL	✓	Comparison of between public and private hospitals. Was concluded that satisfaction directly reflects the actual status of any healthcare institution, but no significant differences were found between public and private regarding the patients' satisfaction.

(Source: prepared by the author)

2.4. Health-related Quality of Life

The World Health Organization (1946) defines health as "*a state of complete physical, mental and social well-being and not merely the absence of a disease or infirmity*" (WHO, 1946: 1). It also adds that, to achieve this vision, society itself should be healthy and sustain conditions, including a healthful environment and equitable social and economic policies to ensure happiness, harmonious relationships and security for everyone (World Health Organization, 1946).

As contextualized in the Chapter 1, people are increasingly more demanding about health issues and creating higher expectations for their healthcare quality.

This refers to some concepts that, to better understand these anxieties, must be acknowledged. The first association is, naturally, with the concept of quality of life (QoL). It is described as a multidimensional concept that consists in the unique and personal perception of life that is influenced by many interrelated factors, such as environment, political climate, socio-economic situation as well as housing, education and employment (Ferreira, 1998; Bagwell, 2016). The World Health Organization Quality of Life (WHOQOL) also defended that quality of life is simply the individual's perception of their level of life within their cultural context, according to their ambitions, expectations, standards, interests and the value system in which they live (WHOQOL, 1994). Though, yet no concept alone can adequately capture the complexity of this topic (Bagwell, 2016).

In terms of health, the appropriate dimension to evaluate is the health-related quality of life and a possible mistake can be to confuse these two concepts. Health-related quality of life is the most investigated area of quality of life, with a range of subcategories related to general health, according to Bagwell (2016): limitations in physical and social activities, limitations in usual activities due to physical health problems, bodily pain, general mental health (psychological distress and well-being), limitations in usual role activities because of emotional problems, vitality (energy and fatigue), and general health perceptions.

In order to meet patients' expectations and needs, health-related quality of life has been extensively studied by health economics researchers (Ferreira and Ferreira, 2006). Numerous studies might be found connecting health-related quality of life with various diseases: Chronic

Liver disease (Šumskienė *et al.*, 2015), Chronic Hepatitis C in adults (Chang *et al.*, 2008) and children (Behairy, 2016), for example. Once there are limited resources, this type of study allows clinical decision-making models, planning and health policies (Ferreira and Ferreira, 2006).

Gaining health may not be the main goal of healthcare services. There is a strong need in capturing the usefulness of health-related quality of life as an instrument for economic evaluations and allocation of resources rather than just health concerns (Coast *et al*., 2008; Makai *et al.*, 2014).

2.5. Health Outcomes Measurement

The measurement of health-related quality of life is an essential concern nowadays. The motivation in measuring it has been increasing since the 1980s and, to do so, a wide variety of methods have been used to achieve this measure (Ferreira, 2003). The concern regarding the distribution of health outcomes in the population result from culture, social, political, economic, and environmental factors (Parrish, 2010). This author also defends that people evaluate health outcomes both subjectively – pain, joy, happiness or sense of self-worth – and objectively – ability to perform physical, mental and social tasks – which makes evaluation more challenging (Parrish, 2010).

In many healthcare systems resources are becoming scarce, and the demand for healthcare far exceeds the current supply. According to Peak *et al.* (2018), this requires "*economic evaluation to aid decision makers with information about the most efficient use of resources in order to maximize the health gained for every unit of currency spent*" (Peak *et al*., 2018: 2). The most common approach, in this healthcare economic point of view, is the cost-utility analysis (Ferreira, 2013; Peak *et al*., 2018).

These utilities were defined by Torrance (1986) as strong values that represent the determination of people's preferences for particular outcomes when confronted with uncertainty. The development of a concept that combines into a single metric both qualitative and quantitative improvements in health-related quality of life, gave raise to the Quality Adjusted Life Years (QALYs). QALYs take into account both quality of life (as a proxy for morbidity) and quantity

of life (as a proxy for mortality). Have been widely used in economic evaluations to measure the benefits of healthcare interventions and even to support decision-making management regarding allocation of resources (Al-Janabi *et al*., 2011; Ferreira, 2003) and comparing cost-effectiveness across different areas and interventions (Peak *et al*., 2018).

Over time, some alternatives to the QALYs were mentioned, such as Healthy Years Equivalents (HYEs) (Gafni *et al*., 1993), Saved Young Life Equivalents (SAVE) (Nord, 1992) or Disability Ajusted Life Years (DALYs) (Murray 1997; Murray and Acharya, 2015; Augustovski *et al.*, 2018). However, the majority of recent research, which combines quantitative and qualitative factors, still recommends the use of QALYs (Drummond *et al*., 2015; Ferreira, 2003; Whitehead and Ali, 2010; Augustovski *et al*., 2018; Peak *et al*., 2018).

To measure QALYs, generic preference-based measures of health-related quality of life are required; the purpose is to capture a broad construct of health over dimensions that are acknowledged to affect the quality of life (Peak *et al.*, 2018). Both EQ-5D and ICECAP instruments are referenced examples of these measures and explained in the following sections.

a. EQ-5D

This instrument was first introduced by the EuroQol Group, in 1990 (EuroQol, 2018). The group emerged from several foreign investigators (from UK, Finland, Sweden, Norway and Netherlands) who shared the same necessity in having an instrument for the health-related quality of life measurement. The purpose was to have an instrument that was not specific to one disease, to be possible to use it as a complement for other health-related quality of life measures, as well as to make the comparison between countries (EuroQol Group, 2000; Ferreira, 2003). Currently, there are three versions of the EQ-5D questionnaire: EQ-5D-3L, EQ-5D-5L, and EQ-5D-Y (EuroQol Group, 2017).

The questionnaire contemplates two parts: a descriptive system and a visual analogue scale.

The first one is a descriptive profile where the health status is measured in terms of 5 different dimensions: **Mobility** (determines the patients' problems in walking), **Self-Care** (the ability of the patients in washing or dressing themselves), **Usual Activities** (the ability in performing activities such as work, study, housework, family and leisure activities), **Pain/Discomfort** (understands the patients' statement regarding their pain or discomfort) and **Anxiety/Depression** (regards the patients' statement about their own anxiety and depression).

On the one hand, for each one of these dimensions using the EQ-5D-3L version, there are 3 levels of impairment to classify the patient's state: no problems (level 1), some/moderate problems (level 2) and extreme problems (level 3). Accordingly, 243 possible states of health will be generated and, if we consider "dead" and "unconscious" conditions, then it is possible to have 245 states to quantify (Barros, 2006; Obradovic *et al.*, 2013). On the other hand, if one considers the EQ-5D-5L version, 5 levels of severity are considered, generating 3125 possible states of health. Finally, the EQ-5D-Y is the version destined for children and adolescents (EuroQol Group, 2017).

This descriptive response will generate an index score of health-related quality of life to illustrate the patient's overall status, according to the population tariff, which is useful for both clinical and economic evaluations (Pattanaphesaj and Thavorncharoensap, 2015; Huber *et al*., 2017; Peak *et al*., 2018).

The second part of the questionnaire presents a visual analogue scale (EQ-VAS) – similar to a thermometer – where the patient indicates how good or bad is his own health in that moment, according to their opinion. This scale goes from 0 – "*worst imaginable health state*" to 100 – "*best imaginable health state*" (EuroQol Group, 2017).

According to Ferreira (2003), this questionnaire might be used with different intentions:

- Description and evaluation of the health state of the patients through the classification of those five mentioned dimensions;
- Comparison between referenced groups (such as another patients or the population in general) or to obtain the health state evaluation over time through an analogic scale;
- Any state of health can be analysed using the obtained preferences for some specific population and then used to similar comparisons;

- The descriptive information and/or the health states valorisation might be analysed according to information about age, gender, or level of education of the questionnaire' respondents.

The EQ-5D simplicity, good validity and reliability have been reported in various conditions and many researchers believed in the potential of this instrument (Granja *et al.*, 2002; Wu *et al.*, 2007; Ferreira, 2003). Ferreira (2003) came even to defend that its role in measuring health-related quality of life seemed to be guaranteed.

Nowadays, it has already conquered its visibility between the most antique and known instruments in measuring the health-related quality of life. As a generic instrument designed to measure health experience, it has been strongly described as a widely validated standardized outcome measure (Obradovic *et al.*, 2013; Makai *et al.*, 2014; Pattanaphesaj and Thavorncharoensap, 2015; Ferreira *et al.*, 2016; Huber *et al.*, 2017; Davis *et al.*, 2017; Peak *et al.*, 2018; Huang *et al.*, 2018).

b. ICEpop CAPability Measure

In economic evaluation, some researchers defend that the isolated health measurement – through QALYs, for example, as mentioned above – is often not sufficient sensitive to some areas of healthcare like mental health, public health and social care (Coast *et al.*, 2008; Al-Janabi *et al.*, 2012). In this perspective, it is suggested that the comparison should be across health and social care policies, so a broader measure of wellbeing was required (Flynn *et al.*, 2015).

The capability approach defines wellbeing in terms of what people can "do" or "be" in their life, through Sen's capability approach (Sen, 2003). In the attempt to obtain information about these important capabilities, a measure of capability wellbeing was developed for older people – ICECAP-O (Investigating choice experiments for the preferences of older people) – that contemplates five attributes such as *attachment* (feelings of love), *security* (feeling safe), *role* (the idea of having a purpose), *enjoyment* (notions of pleasure) and *control* (being independent) (Al-Janabi *et al.*, 2012; Coast *et al.*, 2008). Later on, a wellbeing measure was created for the general

adult population – ICECAP-A (ICEpop CAPability measure for adults). This approach measures the individuals' ability to achieve important functionalities and capabilities that are crucial in their lives: *stability* (being able to settle and feel secure), *attachment* (being able to have love, friendship and support), *autonomy* (being able to be independent), *achievement* (being able to achieve and progress) and *enjoyment* (to be able to enjoy and have pleasure). Both ICECAP-O and ICECAP-A contemplate five attributes each one of them with four levels ranging from full capability to no capability (Coast *et al*., 2008; Flynn *et al.*, 2015). When comparing it with the EQ-5D instrument, it is possible to understand some differences between the dimensions of measurement between these tools: ICECAP-A and ICECAP-O dimensions capture more general wellbeing concerns, while EQ-5D dimensions attempt to analyse health-related quality of life but in more physical terms.

Recently, a new measure was developed: the ICECAP-SCM (ICECAP–Supportive Care Measure), which has been developed to be conducted at an end of life setting (Huynh *et al.*, 2017). End of life care may have elements of value for patients that go beyond health, this way, this latest measure covers attributes such as *choice*, *love and affection*, *physical suffering*, *emotional suffering*, *dignity*, *being supported* and *preparation* (Huynh *et al.*, 2017).

For researchers, as Coast *et al*. (2008) and Flynn *et al.* (2015), these measures are important because they go beyond health issues, however, its validation is still in progress among some countries and some details are still being discussed (Flynn *et al.*, 2015). Values for "no capability" represent zero on the scale, so the dead state implies no capability but the reverse is not necessarily true, for example. There is also a possibility of different researchers to come up with different attributes (Al-Janabi *et al*., 2012).

2.5.1. Previous Studies in Evaluating Health Outcome

With the growing interest and concerns regarding the healthcare sector, there is nowadays a special tendency to investigate and understand how people perceived this sector. Considering this investigation, it is interesting to explore which studies have been focusing on health-related quality of life and wellbeing (Huang *et al.*, 2018) and understand which factors are determinant to

the perception of healthcare outcomes. However, for the Portuguese reality and for our best knowledge, investigation is still poor on this topic.

One of the main motivations in creating the EQ-5D instrument was to have a tool suitable for any disease (EuroQol Group, 2000) and, afterwards, it has been used to evaluate health-related quality of life in several types of disease, such as: inflammatory bowel disease (Stark *et al.*, 2010), chronic pain (Obradovic *et al.*, 2013), diabetes (Konerding *et al.*, 2014; Raymakers *et al.*, 2018), strokes (Golicki *et al.*, 2014), musculoskeletal disorders (Zrubka *et al.*, 2017) or even depression (Huber *et al.*, 2017). Ferreira *et al.* (2016) present a different perspective since they applied the questionnaire to healthy people in order to compare and understand the responsiveness of the different versions of EQ-5D.

Al-Janabi *et al*. (2012) and Flynn *et al*. (2015) deeply investigated the construction and validation of ICECAP-A, while Coast *et al.* (2008) attempted to validate the ICECAP-O for older people.

Other studies, like Davis *et al.* (2017), analysed the difference in responsiveness between EQ-5D and ICECAP-O.

Granja *et al.* (2002) and Lung *et al.* (2017), on the other hand, focused their investigation in long-term care, crucial to understand the EQ-5D questionnaire validity and responsiveness in long-term care outcomes and in decisions-making process. In the research of Granja *et al.* (2012), the instrument was applied 6 months after the patients were discharged from an intensive care, and it was concluded that EQ-5D was able to provide relevant information and that characteristics, such as age and previous health status, are fundamental to assess health-related quality of life. Lung *et al.* (2017) focused their investigation on nursing home services. In this case, the instrument was applied in two different moments, at a baseline and 6 months after. This study compared the EQ-5D with another instrument, concluding that EQ-5D was more sensitive in health status changes.

To better understand these mentioned researches, they are present in Table 2:

Table 2 - Previous studies in evaluating health outcomes

Reference	EQ-5D	Field of Application	Main Conclusions
Granja *et al.* (2002)	EQ-5D-3L	Long-term care	Evaluation of health-related quality of life after an intensive care, concluding that this instrument was important in providing relevant information about the patients.
Stark *et al.* (2010)	EQ-5D-3L	Inflammatory bowel disease	Confirmed the validity of this instrument and concluded about the importance of the VAS to identify minor disease changes, such as worsening of the active disease.
Obradovic *et al.* (2013)	EQ-5D-3L SF-6D	Chronic pain	Concluded that EQ-5D provide a better wider scoring and completion rate than SF-6D, presenting a higher construct validity and performance in this field.
Konerding *et al.* (2014)	EQ-5D-3L	Type 2 diabetes	Concerning the lack in literature in generalize the results of EQ-5D-3L, this investigation was made across 6 different languages and countries. The majority of the versions related the same way to the test variables, indicated its validity.
Golicki *et al.* (2014)	EQ-5D-3L EQ-5D-5L	Stroke patients	Comparison between the two versions, EQ-5D-5L seems to be less responsive than the 3-level version, concerning this population.
Flynn *et al.* (2015)	ICECAP-A	Older adults (≥ 65 years old)	This instrument was used to obtain capabilities values and to evaluate the validity of a capability-focused economic evaluation. Was verified its ability in evaluating both in health field and across public policy.
Ferreira *et al.* (2016)	EQ-5D-3L EQ-5D-5L	Young adults (≤ 30 years old)	The performance of the 5-level EQ-5D was superior to the 3-level one, but the interviews revealed limitations on the questionnaires application due to the lack of experience with illnesses in this age range.
Lung *et al.* (2017)	EQ-5D-3L	Nursing home service	Evaluation of health-related quality of life within this long-term care service, recommending the EQ-5D-3L, which proved to be more sensitive to changes in health status.
Davis *et al.* (2017)	EQ-5D-3L ICECAP-O	Impaired mobility	Focused on old adults with impaired mobility, when comparing the two instruments, EQ-5D-3L is generally more responsive in tracking these conditions.
Zrubka *et al.* (2017)	EQ-5D-3L EQ-5D-5L	Musculoskeletal disorders	Was emphasized that EQ-5D is the preferred instrument to measure health-state utilities and highlighted to the scarcity but the expected growth of EQ-5D-5L data.
Huber *et al.* (2017)	EQ-5D-5L	Depression, heart disease and diabetes	Evaluation of health-related quality of life through the validation of the 5Q-5D-5L in the German population. Reinforces it as a widely standard instrument.
Raymakers *et al.* (2018)	EQ-5D-3L	Type 1 diabetes	Concluded that EQ-5D scores are often used in economic evaluations, useful to inform about decisions and health interventions, and identifying which dimensions have the greatest impact on the overall HRQoL.

(Source: prepared by the author)

2.6. Conclusion

Through this chapter, the two main themes to be addressed were explored, service quality with customers' satisfaction and health-related quality of life.

Earlier literature reviews the concept of service quality as well as its relationship with customers' satisfaction. Both SERVQUAL and SERVPERF scales are widely validated instruments in evaluating service quality. From all the criticisms we may find regarding the utilization of the SERVQUAL, it is important to highlight the customers' expectations criteria. Strong existing literature (Cronin and Taylor, 1992; Jain and Gupta, 2004), defends that a performance-only approach of service quality is enough. In some situations, as in the healthcare sector or specifically in long-term care services, the customers will be questioned after they have already begun to experience the service. Therefore the SERVPERF instrument is considered the most suitable for these situations.

Regarding the selection of metrics and instruments to measure health-related quality of life, the QALYs are well-referenced in literature in measuring the benefits of healthcare interventions. The purpose is to evaluate the health-related quality of life resulting from receiving that service and not the patients' wellbeing, so the EQ-5D instrument is the most adjusted one.

With the use of the EQ-5D instrument to assess health-related quality of life, comes the decision concerning the 3-level or 5-level version of the questionnaire. It is possible to conclude that EQ-5D-5L is a quite recent model but still under evaluation and experimentation. Contrary to EQ-5D-3L, its validity in Portugal is not completely confirmed and no values are already defined to generate an index score of health-related quality of life to the Portuguese context (Ferreira *et al.*, 2013). Additionally, EQ-5D-5L is more subjective, so, in order to avoid in-between answers, the EQ-5D-3L is the proper method for the situation under study. The ICECAP model is also a well-documented tool for evaluating the wellbeing, however, in the same manner, there are no available values confirmed in the Portuguese reality, and using it would require resorting to the UK index score (Coast *et al.*, 2008; Flynn *et al.*, 2015).

Another question that must be considered carefully, respects the expected sample. As mentioned before, nowadays, a significant part of patients under long-term care are the older population and cases involving young patients are just one-off cases. According to the research of Ferreira *et al.*

(2016) and Golicki *et al.* (2014), EQ-5D-5L was less responsive than the EQ-5D-3L in tracking health status conditions and changes.

Finally, through the studies and respective theoretical background in the presented literature, two gaps emerged. To the best of our knowledge, there are still few studies applying these instruments in the long-term care sector, and there are no studies, combining SERVPERF and EQ-5D to this purpose, namely in Portugal. A research opportunity is created to cross-evaluate perceived service quality and health-related quality of life, contributing to literature in the area.

3. Methodology

3.1. Introduction

Concerning the path a research should follow, Yin (2009: 3) states that it "*begins with a thorough literature review and the careful and thoughtful posing of research questions and objectives. Equally important will be a dedication to formal and explicit procedures when doing the research.*"

The present chapter intents to present the model on which the investigation is based on, as well as the methods to be followed regarding the objectives presented in the first chapter.

In order to reach these proposed objectives, this chapter will firstly present the conceptual model and the investigation hypotheses that will be tested. Afterwards, the process and context regarding the data collection and the instruments that will be used to analyse the hypotheses will be both explained.

3.2. Case Study

This investigation represents a special singularity. Since the initial definition of the problem under study, this topic brings us an exploratory analysis of a one of a kind study and, once this topic, to the best of our knowledge, has never been tested before, it becomes crucial to define which is the most suitable research method. Taking into account all the previously mentioned definitions, from the perspective of Yin (2009), it is understandable to consider it as a Case Study.

Yin (2009) described the case study as a method that contributes to the knowledge of an individual or group phenomena, frequently used with the need of understanding a complex social singularity. In other words, it allows researchers to retain the holistic and meaningful characteristics of real-life events (Yin, 2009).

To better understand when to use case studies, there are three factors that determine the most suitable research methodology (Yin, 2009; Rowley, 2002):

- The types of questions to be answered
- The extent of control over behavioural events
- The degree of focus on contemporary as opposed to historical events

Through these factors, it is possible to understand how the method is suitable for this research. Firstly, the presented research questions are mainly "how" and/or "why" questions, typical in case studies, as Yin (2009 defended. Moreover, a case study usually represents a contemporary event where the relevant behaviour cannot be manipulated (Yin, 2009): in this case, the investigator will have no control, at least intentional, over the events.

This investigation is also focused on a contemporary reality, an exploratory investigation with no registered historical events for the unit under study – which will be analysed through direct observation and interviews. Eisenhardt (1989) earlier defended that case studies are particularly well-suited to point new research areas or areas in which existing theory and past empirical observation seem inadequate. According to Yin (2009), "*it adds two sources of evidence: direct observation of the events being studied, and interviews of the person involved in the events*" (Yin, 2009: 11), it is going beyond the range of evidence available in historical study.

A concern that comes along with this research method, still under the perspective of Yin (2009), is that its findings might provide little basis for scientific generalization. However, some defend that once case studies facilitate learning on the part of those who use them, it involves already a "naturalistic generalization" (Gomm *et al*., 2000). It is understandable that some previously developed theory is used as a template with which to compare the empirical results of the study, only cannot be generalized to other cases (Yin, 1994; Rowley, 2002).

In the health sciences field, case studies still have value because they allow to communicate timely and innovative approaches and create hypotheses that will be an essential base for further investigation (Akers and Amos, 2017). Voss *et al*. (2002) defended that, once constrained by some rigid limits, case studies can lead to a new and creative insight, development of a new theory and have high validity with the ultimate user of research.

To do so, the research design and how to conduct the data collection and analysis will be explained in the following sections.

3.3. Investigation Hypotheses

Aiming at understanding perceived service quality in the healthcare context, previous studies used the respondents' characteristics to that effect. Zarei *et al.* (2012) and Li *et al.* (2015) used the gender, age and education level to characterize the sample and concluded that these influence the perceived service quality. The same conclusions were obtained by Georgiadou and Maditinos (2017) regarding the professional occupation, and Chari *et al.* (2016) and Levinton *et al.* (2011) about the residence. In the research of Coast *et al.* (2008) the living arrangement – if the patients live alone or with others – showed to influence the perceived service.

To understand if, in this particular case of the long-term care unit, the perceived service quality is influenced by **gender**, **age**, **residence**, **education level**, **professional occupation** and **living arrangement** – hereafter called as **patients' characteristics** – the following hypotheses were formulated:

H1: The **patients' characteristics** influence the overall level of perceived service quality of the long-term care unit and all the five quality dimensions presented by Parasuraman *et al*. (1988).

> **H1a:** The **patients' characteristics** influence the overall level of perceived service quality of the long-term care unit.
>
> **H1b:** The **patients' characteristics** influence all the five quality dimensions presented by Parasuraman *et al*. (1988).

Regarding the service characteristics, Carman (1990) posit that the patients' familiarity with the service may affect their perception of the service. Patients who were already related with the service – previous institutionalization or long-term stays, for example – might perceive the service quality differently from those who are having the first contact with the unit under study. In addition, Zarei *et al.* (2012), concluded that a previous hospitalization in the current hospital have impact on perceived service quality. This way, considering its applicability in this context and to verify the influence of **previous institutionalization** and **duration of institutionalizatio**n – hereafter called as **service characteristics** – the following hypotheses are formulated:

H2: The **service characteristics** influence the overall level of perceived service quality and all the five quality dimensions presented by Parasuraman *et al*. (1988).

H2a: The **service characteristics** influence the overall level of perceived service quality.

H2b: The **service characteristics** influence all the five quality dimensions presented by Parasuraman *et al*. (1988).

Previous studies as the one of Zamil *et al.* (2012), Mahapatra (2013), Li *et al.* (2015) and Al-Neyadi *et al.* (2018), centred their research on understanding the difference on the perceived service quality among patients of the private and public sector. From these, only Li *et al*. (2015) observed some significant differences between these two groups. In order to access the influence of private and public long-term care provision (i.e., of different network characteristics) on the perceived service quality, the following hypothesis are considered:

H3: The **network characteristics** influence the overall level of perceived service quality and all the five quality dimensions presented by Parasuraman *et al*. (1988).

H3a: The **network characteristics** influence the overall level of perceived service quality.

H3b: The **network characteristics** influence all the five quality dimensions presented by Parasuraman *et al*. (1988).

Considering the patients' satisfaction, several researches intend to understand which characteristics might impact their satisfaction level. Resorting once again to the research of Mahapatra (2013), this one concluded that patients' characteristics, such as gender, age, education, and living arrangement have positive impact on patients' satisfaction. Zarei *et al.* (2012) defended that familiarity with the hospital and previous hospitalization have also impact on satisfaction. Additionally, Zamil *et al.* (2012) and Al-Neyadi *et al.* (2018) concluded that there is no significant differences on satisfaction among patients of private and public sectors, on the other hand, Li *et al.* (2015) observe some significant differences. From their point of view, to verify this influence in the present investigation, the following hypotheses were formulated:

H4. The **patients' characteristics** influence the overall satisfaction of the patients in the long term care unit.

H5: The **service characteristics** influence the overall satisfaction of the patients in the long term care unit.

H6: The **network characteristics** of treatment influences the overall satisfaction of the patients in the long term care unit.

Scholars such as Tam (2004) and Shahraki (2014) investigated both service quality and customer satisfaction, and others like Andaleeb (2001) and Monet (2007) further deepened this knowledge in the healthcare sector, defending the inseparability of these two constructs. With the purpose of understanding the existence of the relationship between service quality and patients' satisfaction, the following hypotheses are formulated:

H7: There is an association between the overall perceived service quality and the overall satisfaction of the patients in the long term care unit.

To better understand the formulated hypotheses above, Figure 1 represents the conceptual model obtained from those:

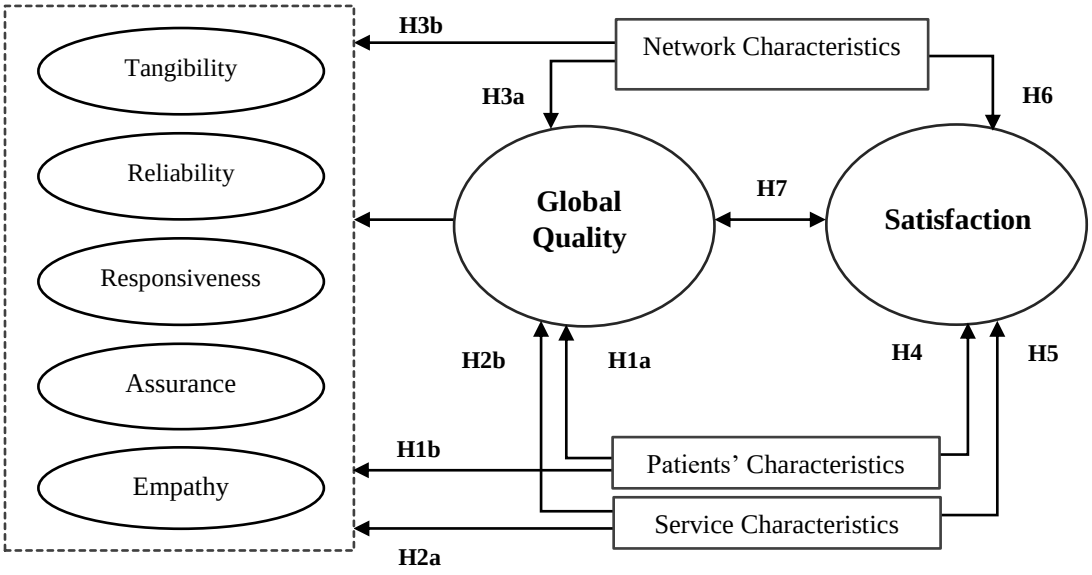

Figure 1 - Conceptual Model of H1 to H7
(Source: prepared by the author)

When evaluating the health-related quality of life, Granja *et al.* (2012) and Lung *et al.* (2017) used patients' characteristics – age, gender, education, residence and professional occupation – and concluded that these factors might affect the improvement as perceived by the patients. Coast *et al.* (2008) also added the impact of the living arrangement to those characteristics. The hypotheses are divided between health state improvement and self-evaluated health status improvement, once the health-related quality of life, through the EQ-5D, is measured resorting to two different scales. To verify the influence of these features on the health-related quality of life improvement, the following hypotheses were formulated:

H8: The **patients' characteristics** influence the improvement in the health-related quality of life as perceived by long-term care patients.

H8a: The **patients' characteristics** influence their health state improvement.

H8b: The **patients' characteristics** influence the self-evaluated health status improvement.

Similarly with the evaluation of perceived service quality, it is essential under the scope of the present research to analyse how the familiarity with the service may impact the health-related quality of life, as well as the possible differences among the patients under private and public network.

H9: The **service characteristics** influence the improvement in the health-related quality of life as perceived by long-term care patients.

H9a: The **service characteristics** influence the patients' health state improvement.

H9b: The **service characteristics** influence the self-evaluated health status improvement.

H10: The **network characteristics** influence the improvement in the health-related quality of life as perceived by long-term care patients.

H10a: The **network characteristics** influence the patients' health state improvement.

H10b: The **network characteristics** influence the self-evaluated health status improvement.

As mentioned before, several researchers, such as Drummond *et al*. (2015), Ferreira (2016), Augustovski *et al*. (2018) and Peak *et al*. (2018), have strongly recommended the use of QALYs as a metric in measuring the health-related quality of life and, more specifically, Ferreira (2016) and Peak *et al*. (2018) recommend the EQ-5D-3L as the proper instrument to quantify these QALYs.

EuroQol Group (1990) suggested this instrument composed with two different dimensions. Whynes (2008) focused his investigation on understanding the correspondence between these two measures of EQ-5D, concluding about an existence relationship between the EQ-5D VAS and EQ-5D Index. Considering the context of the present investigation, in order to understand how the two EQ-5D-3L scales are associated, the following hypotheses is formulated:

H11: There is an association between the health state improvement and the self-evaluated health status improvement measures proposed by the EuroQol Group (1990).

Formulated these hypotheses, Figure 2 represents the conceptual model constructed for this part of the analysis:

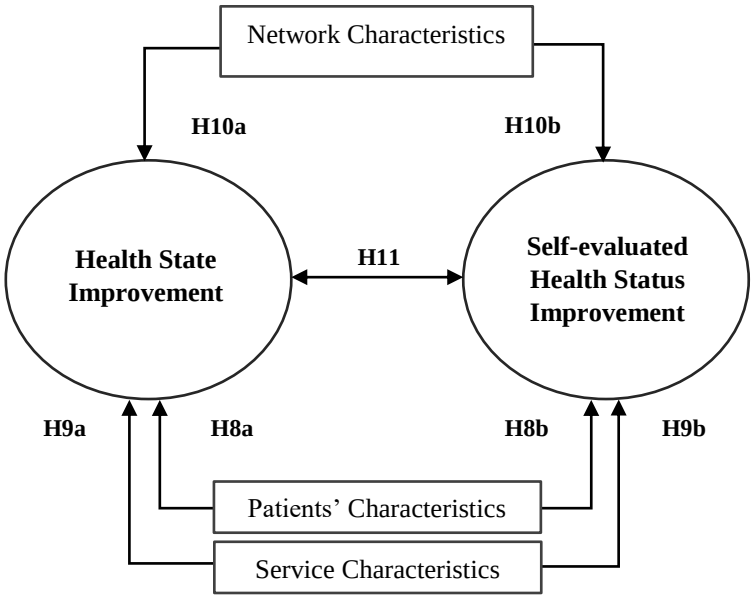

Figure 2 - Conceptual Model of H8 to H11

(Source: prepared by the author)

According to the scope of the study, one of the major intentions within the present investigation is the combination of perceived service quality in long-term care with the health-related quality of life. It becomes relevant to analyse the relationship between these two dimensions.

According to Whynes (2008), the EQ-5D VAS gives a quite subjective perception about the health status of the patient, once it measures how the patient feels in that specific day, without guaranteeing that would be the same in another day. The EQ-5D Index is already a straighter and tangible evaluation of the patients' state of health, measured with concrete health dimensions that makes it more objective. Consequently, in order to focus only on the components with greater objectivity, the EQ-5D Index will be used to verify if there is an association between the health state improvement and the perception of service quality. The following hypotheses emerge:

H12: There is an association between the perception of service quality in the long-term care unit and the health state improvement of the health-related quality of life.

Figure 3 presents the conceptual model representing H12:

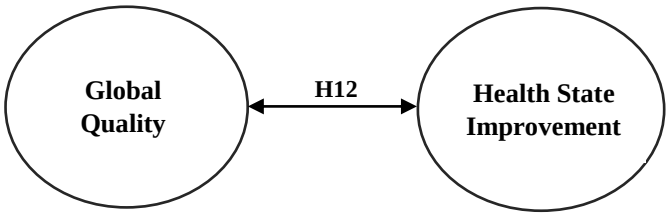

Figure 3 - Conceptual Model of H12

(Source: prepared by the author)

3.4. Data Collection Instruments

According to the discussion in the literature review, different instruments should be used to evaluate patients' perceived service quality, patients' satisfaction and HRQoL as perceived by patients.

Regarding the assessment of perceived service quality in long-term care settings, the most appropriate instrument to be used in the current research is the SERVPERF. This one is a modified version of the SERVQUAL scale. SERVPERF will be chosen due to its advantages, at

both conceptual and application perspective, and better adequacy (Cronin and Taylor, 1992; Jain and Gupta, 2004).

As mentioned before, the questionnaire has 22 items that must go through adaptations to adjust it to the healthcare and long-term care context. These items evaluate the service quality from the customers' perceptive – without customers' expectation that would already be influenced – and, as proposed by the authors mentioned above, are also aggregated into 5 quality dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy.

The applied questionnaire can be found in Annex 1 and its items were aggregated in the Table 3:

Table 3 - Dimensions of the SERVPERF instrument and respective questionnaire items

DIMENSION	ITEMS	
TANGIBLES 4 ITEMS	**P1 to P4**	Contemplates tangible and physical aspects of the service, including the appearance of the facility and of the equipment used by the unit, as well as the appearance of the medical personnel.
RELIABILITY 5 ITEMS	**P5 to P9**	Gives information about the ability of the unit in providing the service in the promised terms. If the service is accurately applied at the first time and if the personnel keeps a correct documentation.
RESPONSIVENESS 4 ITEMS	**P10 to P13**	Concerns the readiness in providing the service, with prompt information and availability to serve the patient.
ASSURANCE 4 ITEMS	**P14 to P17**	Demonstrate the ability of the medical personnel in having a relationship of trust and confidence with their patients. Evaluates the attitude when providing the service.
EMPHATY 5 ITEMS	**P18 to P22**	Evaluates the individual treatment, the ability of the personnel in providing a personalized service and comprehension of each patient's individual needs.

(Source: prepared by the author)

For these 22 items, the scale to be used is the one also suggested by Parasuraman *et al*. (1988) and Cronin and Taylor (1992), a 7-point Likert-like scale, from "1 – Totally Disagree" to "7 – Totally Agree". According to these authors, this scale facilitates the questionnaire application for the investigator and it is also easy for the patients.

Another item (P23) was included to verify the overall patients' perceived quality with the long-term care treatment. This one is also evaluated with the 7-point Likert-like scale, this time from "1 – Very Low" to "7 – Very High".

To evaluate the satisfaction construct in the context of the study, another dimension was considered. To do so, several items were added (P24, P25, P26, P27 and P28). These items are based on the previous research of Babakus and Mangold (1992), and then mentioned in Andaleeb (2001) and Chatzoglou *et al.* (2014), where they built their evaluation of customers' satisfaction in these items. These were also evaluated with the same 7-point Linkert-like scale, from P24 to P28, once more "1 – Totally Disagree" to "7 – Totally Agree".

In order to operationalize the investigation hypotheses H8, H9 and H10, there is need to resort to the EQ-5D-3L instrument. As stated in the previous chapter, to measure health-related quality of life is recommended the use of QALYs (Drummond *et al*., 2015; Ferreira, 2016; Peak *et al*., 2018) and the EQ-5D is the preference-based measure widely used in this cost-utility analysis (Ferreira, 2016). Created by the EuroQol Group, contemplates 5 dimensions to evaluate the health status, aggregated in Mobility, Self-Care, Usual Activities, Pain/Discomfort, and Anxiety/Depression.

For each of these dimensions, there are 3 different levels of severity to evaluate the patient's condition. The level 1 is when the patients have no problems or do not identify themselves with that health condition, the level 2 is when they have some problems or moderately identify themselves with those conditions and, lastly, the level 3 is chosen by those who face that problem and feel extremely identified with that condition.

In the second part of the questionnaire, the patients are asked to mark, in a scale from 0 to 100, how is their health state in that day. The 0 represents the worst state of health and 100 the best state of health possible.

3.5. Definition of Independent Variables

In addition to the data gathered based on the previous mentioned questionnaires, it is necessary to collect the following additional information (with these representing the independent variables):

Gender, as a binomial variable, appears with feminine and masculine as response options. **Age**, according to INE (2015), is divided into 6 echelons: from 18 to 24 years old; 25-34 years old; 35-44 years old; 45-55 years old; 55-64 years old; 65 or more years old. To consider adults-only, the age groups start at a minimum age of 18 years old.

Education Level, also according to INE (2015), may be divided as: does not can read or write; 1st Basic Cycle (4th year of schooling); 2nd Basic Cycle (6th year of schooling); 3rd Basic Cycle (9th year of schooling); High School (12th year of schooling); Bachelor's Degree; Postgraduate; Master's Degree or superior.

Residence, according to INE (2015), considers Norte, Centro, Alentejo, Algarve, Região Autónoma dos Açores, Região Autónoma da Madeira and Lisboa and Vale do Tejo.

Professional Occupation, according to INE (2015), it will be divided in 6 groups: Student, Employed, Self-Employed, Unemployed, Retired or another.

The variable regarding the **Duration of Institutionalization**, which measures how long the patient is under the treatment when applying the questionnaire, was divided as: less than 1 week (inclusive); between 1 week and 2 weeks (inclusive); more than 2 weeks. These groups were established taking into account the nature of the long-term type of healthcare under study and its duration.

3.6. Population and Sample

This research was conducted at Hospital do Mar, Cuidados Especializados de Lisboa. As it would not be possible to study the total population of patients, only a sample will be considered.

The population for this study is composed of patients receiving long-term care in convalescence care setting and patients in geriatrics. Officially, geriatrics is not considered as one of the long-term care unit, however, for the current analysis, the type of healthcare was analysed as a single

one, not distinguishing between convalescence and geriatrics. This consideration was based on the fact that the treatment procedure followed by the hospital under study, such as the process and duration, used for geriatrics is exactly the same as the convalescence care. Moreover, patients were considered all as equals, as recommended by the hospital.

To be able to take the questionnaires, patients had to be older than 18 years old and have the particularity of being cognitively aware. Patients suffering from dementia or other similar condition might not respond according to their true consciousness, influencing the results of the study, so they could not be considered. On the 13th March 2018, the author attended a meeting at the Hospital with doctors and social workers in order to identify the patients that fit the criteria above. The sample is, therefore, a non-random one once it was conducted for convenience.

In the hospital' meeting, 54 patients were suggested, by the healthcare professionals, to participate in the study. Out of this potential sample, only 48 responses were collected. The remaining cases were patients discharged from the hospital sooner than expected and did not complete the 30 days of treatment.

Under this context, the potential and effective sample are the same. Since those patients did not complete the treatment at the predicted period, it would not be possible to include them in the research. This way, it is possible to consider that the sample represents the whole population suitable for the research but not represents the whole population of long-term care patients.

3.7. Pre-Test and Data Collection

Before applying the questionnaires, it is recommended to test it in order to detect possible flaws and to consider recommended improvements to the final version. To guarantee that the questionnaires are adequate to the population under study, a pre-test was conducted to 8 persons over 65 years old, selected by the author – taking into account that it is expected that this study will focus mainly on people in this age range. This pre-test was conducted face-to-face and the participants only had to respond to the SERVPERF questionnaire, once the EQ-5D is already a standard tool. According to their feedback, just some expressions were modified to make them more understandable and not too technical.

Data was collected between the 21st March and the 21st June, 2018. Firstly, in the first meeting with the patients, they were questioned regarding their personal and service characteristics, and was also filled the EQ-5D instrument for this first moment. 30 days later, a second meeting was conducted in order to apply the EQ-5D, for the second time, and the SERVPERF questionnaire.

3.8. Data Analysis Tools

Data treatment and analysis will be conducted through several statistical techniques, in order to achieve the purpose of the study.

3.8.1. Hypotheses' Testing

According to Laureano (2013), hypotheses' testing is the statistical procedure that aims at testing suppositions about the population, through the sample. This procedure will allow to test the investigation hypotheses H1, H2, H3, H4, H5, H6, H8, H9 and H10.

For Marôco (2014), these tests are usually classified in two groups: parametric and non-parametric.
The **parametric** tests are usually more frequently used and its application requires the fulfilment of two assumptions:

- **Normality –** the dependent variable follows a normal distribution. To test normality the **Kolmogorov-Smirnov** test can be used when the sample has $n \geq 30$ and the **Shapiro-Wilk** when it has $n < 30$ (Marôco, 2014);
- **Homoscedasticity –** the variables follow a homogeneous variance. In these cases, there is a comparison between two or more populations. To test the homogeneity the **Levine** test is the recommended one (Marôco, 2014).

When the population comply with these assumptions **parametric** testes can be used, and it is possible to use the ***t*-student test, which** allows the comparison between two populations' means, or the **ANOVA one-way** test for the comparison between more than two populations (Marôco, 2014).

The **non-parametric** tests do not require normal distribution and are used when those assumptions are not meet. In these cases, the **Wilcoxon-Mann-Whitney** test is used as an alternative to the *t*-student test, and Marôco (2014) posits it is the most suitable test to compare variable distribution, at least ordinal measure in two independents samples. As an alternative to the ANOVA one-way, **Kruskal-Wallis** test is the recommended one to compare more than two populations.

When the null hypotheses (H_0) is rejected, both in parametric or non-parametric tests, it is possible to conclude that there is, at least, one population mean that is different from the others. In this situation, it becomes necessary to identify which are the groups that have that difference and the *post-hoc* tests of multiple mean comparison are in order. Within these, **Benferroni** test is the recommended one to samples where $n < 30$ and the **Tukey** one for $n \geq 30$ (Marôco, 2014).

3.8.2. Correlation Coefficient

In order to test the investigation hypotheses H7, H11 and H12, the correlation coefficient must be used. This method is used to measure how strong a relationship is between two variables. To do so, **Pearson**'s correlation coefficient is the most commonly used one and it measures the strength in a linear relationship between two quantitative variables. In those cases where this relationship is not linear, the non-parametric alternative is the **Spearman's** correlation coefficient using a monotonic function (Laureano, 2011).

According to Marôco (2014), a confidence interval of 95% should be used. Within these observations, a coefficient is sufficiently reliable when $\rho > 0.5$ and $\rho < -0.5$. This coefficient may achieve value between $-1 \leq \rho \leq 1$, where values closer to 1 mean that the variables are positively correlated – following the same direction and behaviour – and those closest to -1 are negatively correlated – when one increases and the other one decreases.

3.9. Conclusion

To summarize, Table 4 allows the understanding of the construction of this investigation and its internal consistency. In order to answer the research questions and complete the objectives of analysing the perceived service quality, patients' satisfaction and health-related quality of life in a long-term care unit:

Table 4 - Summary of Specific Objectives, Research Questions and Analysis Techniques

Specific Objectives	Research Questions	Analysis
O1. Evaluate patients' perception of quality of the service received by the Portuguese Long-term Care unit.	Q1. What is the customers' perception about both health-related quality of life and service quality provided by the Long-term Care Unit?	Descriptive Analysis + Hypotheses' Testing (H1, H2)
O2. Evaluate health-related quality of life, as perceived by patients.		Descriptive Analysis + Hypotheses' Testing (H8, H9, H10, H11)
O3. Analyse the strength of the association between perceived quality and satisfaction with the service received by the long-term care unit.	Q2. Is there an association between the perceived service quality and the level of satisfaction with the service received?	Correlation Coefficient (H7) + Hypotheses' Testing (H4, H5, H6)
O4. Evaluate the strength of association between the health-related quality of life and the perceived service quality.	Q3. Is there an association between health-related quality of life and perceived service quality?	Correlation Coefficient (H12)
O5. Comparative assessment of perceived service quality and health-related quality of life between patients receiving long-term care in public and private networks.	Q4. How is perceived the service quality and health-related quality of life between patients receiving long-term care in public and private networks?	Hypotheses' Testing (H3, H6, H10)
O6. Propose managerial recommendations on the service delivery in the long-term care unit.	Q5. Which managerial recommendations in the service delivery can improve the perceived service quality and the perceived health-related quality of life?	Qualitative Approach

(Source: prepared by the author)

4. Analysis of Results

4.1. Introduction

In this fourth chapter, will be presented the results raised from the data analysis about the perceived service quality and health-related quality of life in a long-term care unit, in Portugal, from the patients' perspective.

The chapter will begin with a description of the unit under study, followed by a descriptive analysis regarding the sample and the service. Then, will be realized an analysis to the consistence of the constructs and the some tests will be conducted to answer the investigation hypotheses. At the end, a qualitative approach is presented to propose some measure of improvement to the service delivery. Finally, the results will be discussed.

4.2. Long-Term Care

As presented in Chapter 1, this research is focused on evaluating a long-term care unit. To better understand this concept and how it is integrated into the healthcare sector, the following subchapters explain how long-term care is defined, at a global and national level, and the long-term care unit under study will also be presented.

4.2.1. Definition of Long-Term Care

According to the definition of the World Health Organization (WHO), the long-term care systems "*enable old people, who experience significant declines in capacity, to receive the care and the support of others consistent with their basic rights, fundamental freedoms and human dignity*" (WHO, 2018: 1).

Besides its health outcomes, still under the perspective of the WHO (2018), these long-term care services may represent a quite significant role. These services also intend to help reduce some inappropriate use of health-care services and to avoid catastrophic care expenditures. Moreover, the purpose is also to fight for the concept of "free women": once women are usually the main

caregivers in this care, an accessible system can help them to have broader social roles (WHO, 2018). Loneliness, social exclusion and low self-esteem are also examples of frailties and disabilities that can be covered by these care services (Forder and Caiels, 2011).

Serious concerns regarding the quality of long-term care services still persist nowadays, including not only the users but also their family. The focus on quality, cost and accessibility of care still remains despite some improvements in the last years (National Academy of Sciences, 2011).

4.2.2. Long-Term Care in Portugal

In order to assist people who are dependent on help for basic activities of daily living, usually during a considerable period of time, these services are designated as a range of sequential health and social support interventions (Ministry of Health, 2006). The purpose is to promote autonomy through their rehabilitation, social reintegration and adaptation (Ministry of Health, 2006).

In Portugal, in the earlier times, *Misericórdias* and other independent charitable organizations, such as day centres and nursing homes, were the key providers of these long-term care services (Simões *et al.*, 2017). However, in 2006, in response to the mentioned demographic changes – such as the increase in female employment and the concept of "free women" defended by the WHO – and the need to provide quality in long-term care characterized by the lack of resources (Ministry of Health, 2006) the National Network of Long-Term Care (Rede Nacional de Cuidados Continuados Integrados, RNCCI) was created (Ministry of Health, 2006).

This new organizational model, created within the scope of the Ministry of Health and the Ministry of Labour, Solidarity and Social Security, is based on an integrated and articulated model of health and social security that involves the collaboration of several social or private partners, civil society and the State (Finance, Labour, Solidarity and Social Security and Health, 2017).

Regarding the units of interment, there are several types of care. Convalescence (Unidade de Convalescença, UC) concerns short-term recovery, predictability of hospitalization up to 30 consecutive days. The Medium-term Care and Rehabilitation (Unidade de Média Duração e

Reabilitação, UMDR) refers to hospitalization periods between 30 and 90 days. Long-term Care and Maintenance (Unidade de Longa Duração e Manutenção, ULDM) is intended for patients for whom the hospitalization is longer than 90 days. Lastly, there is the Palliative Care (Unidade de Cuidados Paliativos, UCP) destined to people with complex diseases in an advanced state, with evidence of curative therapeutic failure or terminal phase (JRO, 2018).

4.2.3. Hospital do Mar, Cuidados Especializados de Lisboa

To achieve the purpose of this study, as mentioned in the first chapter, the investigation was focused in one hospital.

Hospital do Mar Cuidados Especializados de Lisboa is part of Luz Saúde. This group was created in 2000 and nowadays, according to their site, is one of the biggest healthcare delivery groups in Portugal. Hospital do Mar was established in 2006, introducing an innovative concept in the healthcare sector. It has two different inpatient units, depending on the type of care, with 110 beds in a total of 88 rooms.

One of its main values is that each patient is a special case who must receive a special attention, the hospital puts its efforts in providing a comfortable and familiar environment with security and resources to attend patients' specific needs. Hospital do Mar covers both private and public services, they receive patients in private regime as well as those integrated on the RNCCI, mainly for convalescence and palliative treatments. This hospital provides, as well, medical appointments in general clinic, internal medicine, neurology and physiatrist.

According to their own statement, regarding its localization, the hospital is both stimulating and therapeutic: close to the sea and with therapeutic gardens, Hospital do Mar provides a privileged landscape and are proud in offering hospital services with the comfort of a hotel.

4.3. Sample Characterization

To characterize the sample regarding the patients' characteristics, the following variables were used: gender, age, residence, education, and living arrangement. In the Table 30 in Annex 2, we may observe both absolute and relative frequencies for these variables, allowing characterizing the sample.

According to **gender**, it is possible to verify a relatively balanced distribution with 56% for the feminine and 44% male gender patients in the sample.

Regarding the independent variable **age**, it was evaluated based on 6 age groups. Then, taking into account that patients are mainly with advanced age, this variable was aggregated into 2 groups, "65 years or more" and "64 years or less". According to this categorization, the sample shows that 77% of the patients are 65 or more years old and 23% are 64 or less years old.

For the **education** level, firstly aggregated in 9 groups, was then evaluated in 3 and the results were also quite composed. A substantial part of the patients in the sample, 33%, only completed the 4^{th} year of schooling or less and 27% have between the 6^{th} and 12^{th} year of schooling. Surprisingly, the remaining 40% of patients in the sample have, at least, a bachelor's degree, revealing a well-educated sample.

The **residence** of the patients was also considered. The 7 regions considered initially were aggregated in 2 main groups. The majority of patients in the sample are from "Lisboa and Vale do Tejo", about 77%, and the other 23% from "Outside Lisboa and Vale do Tejo".

Finally, considering the **living arrangement** of the patients in the sample, 52% of them lived alone before being institutionalized and 48% with family or similar.

4.4. Service Characterization

Table 31 in Annex 2 represents both absolute and relative frequencies for the variables considered for service characterization.

Regarding the **network**, there is a balanced distribution of patients in the sample: 52% are under the public network – receiving treatments under the RNCCI – and the remaining 48% represent patients under private regime.

The **duration of institutionalization** was assessed initially based on 6 groups and then reduced to 3. It was verified that 42% of the patients in the sample are receiving healthcare treatment for a period between 1 and 2 weeks. The proportion of patients that were institutionalized less than 1 week and more than 2 weeks at that time is of 29% each.

Furthermore, concerning a **previous institutionalization**, for 54% of the patients in the sample this was their first contact with the service and 46% have already been under the treatments at this current institution, at least once before.

4.5. Reliability of SERVPERF and Satisfaction

In order to use the SERVPERF dimensions and the Satisfaction construct, it is crucial to analyse the validity of these constructs in the scope of the sample in use. The purpose is to measure the internal consistency among the items and, so far, the most appropriate coefficient to do this analysis is the Cronbach's Alpha (Churchill, 1979; Andaleeb, 2001).

Marôco (2009) refers to this test as the reliability measure that is applicable to every dimension and to global model. The alpha's value varies between 0 and 1 and, according to Nunnally (1978), an instrument is considered reliable when that value is at least 0,70. The closer to 1 the alpha's value is, the greater the internal consistency of the construct is.

Table 5 - Cronbach's Alpha for each dimension of the instrument

Dimension	Cronbach's Alpha
Tangibility	0,884
Reliability	0,852
Responsiveness	0,867
Assurance	0,867
Empathy	0,919
Global Instrument	0,957
Satisfaction	**0,836**

(Source: prepared by the author)

Table 5 presents the alpha's values for the SERVPERF dimensions and Satisfaction construct. All of them are higher than 0,70, pointing out good reliability and proving to be consistent constructs to evaluate this concrete reality.

In Annex 6, Table 43 represents in detail the level of contribution of the Satisfaction' items to the global reliability of the construct, allowing to understand the reliability of the dimensions if each of the items were individually removed. If any of the items were eliminated, the construct' alpha will always be lower than the original. This is a reason to keep all the five items.

4.6. Perceived Service Quality Analysis

In this subchapter, in order to analyse the perceived service quality in the long-term care unit, an analysis of the 22 standardized items of the SERVPERF model is made. The mean and standard deviation (in the 7-points Likert like scale) that patients in the sample attributed to each item and the overall appreciation of all the five dimensions are presented.

Table 32, in Annex 3, contains the values to fundament the results in this subchapter. From the instrument, the item with highest perceived service quality is the P15 – "*As a patient, you trust in the service provided by the healthcare professionals of this Long-term Care Unit*" and right

followed by the P3 – "*The healthcare professionals of this Long-term Care Unit have neat appearance and appropriately dressed*", with a mean of 6,54 and 6,52. These items belong to the Assurance and Tangibility dimensions, respectively with a mean of 6,24 and 6,18, which are also the dimensions with the highest values of perceived service quality.

On the other hand, the item with the lowest values of perceived service quality is P11 – "*The healthcare professionals of this Long-term Care Unit provide you a prompt service*", with a mean of 4,96. This item is included in the Responsiveness dimension, which is the one with the lowest perceived service quality (mean of 5,63).

Regarding the consensus among patients, Tangibility is the dimension with more consensus (Standard Deviation – SD of 0,791) and with the most critical values once the two items that show more and less consensus among responses are P3 (SD of 0,583) and P1 – "T*his Long-term Care Unit has modern looking equipment*" (SD of 1,192), respectively. Responsiveness is the dimension with less unanimity (SD of 0,986).

Table 6 - Perceived service quality by dimension

Dimension	Mean	SD
Tangibility	6,18	0,791
Reliability	5,63	0,809
Responsiveness	5,72	0,986
Assurance	6,24	0,917
Empathy	5,76	0,892

(Source: prepared by the author)

In general, patients have a highly strong perception of the service quality, however, their perception is different among the different dimensions. The most agreement between respondents is in terms of the visual impact of the facilities, equipment and the personnel appearance.

When evaluating the ability of provide an accurate service within the promised terms and a prompt service, patients perceived a lower level of service quality. The values are still quite high, but it is possible to observe minor consideration under the patients' perception.

The relation between patients and healthcare professionals seems to be built with confidence, patients have a good agreement regarding the ability of the personnel in providing a personalized

and individual attention. It is possible to understand from this evaluation that patients take kindly the attitude of the healthcare professionals.

4.7. Health-related Quality of Life

Being the selected instrument to measure health-related quality of life, it is necessary to measure the two parts that compose the EQ-5D instrument. The first one refers to the EQ-5D index, measured as "**Health State Improvement**", and the second one is a visual analogue scale measured as "**Self-evaluated Health Status Improvement**".

4.6.1. Health State Improvement

To measure this part of the instrument becomes crucial to use the "Portuguese population-based predicted weights for all the 243 health states", recognized in the research of Ferreira *et al.* (2013).

Resorting to this research, was possible to compute the values into real states of health and to calculate the difference between the two moments of application. A value is attributed to each health state, this index might assume values from "-0,536" to "1,000", representing the worst (33331) and the best (11111) scenario, respectively.

Table 7 presents the results for the analysed sample: on the first moment, the patients' Health State Improvement was around 0,243 and increased to about 0,548 on the second one.

Table 7 - Descriptive analysis of Health State Improvement

	1st Moment	2nd Moment
N	48	48
Minimum	-0,344	-0,101
Maximum	0,767	1,000
Std. Deviation	0,267	0,259
Mean	**0,243**	**0,548**

(Source: prepared by the author)

Between the first and second moments, health state improved in a considerable way, as it is possible to conclude from Table 7. Table 34, in Annex 4, presents the frequency of responses in each dimension.

At the beginning, 96% of patients referred to having problems with mobility; 75% and 83% referred to also have problems with their self-care and usual activities, respectively. Still, 67% of patients were with pain or discomfort and 52% admitted to being anxious or depressed.

After the 30 days of treatment, the improvement is remarkable in every dimension. In mobility, 77% of patients were still having problems in walking. Regarding the self-care and usual activities, 50% and 63% of the patients mentioned continuing with some kind of problems. It is possible to observe greater changes in the remaining dimensions, 77% of the patients referred to have no pain or discomfort and also 77% considered not being anxious or depressed at all.

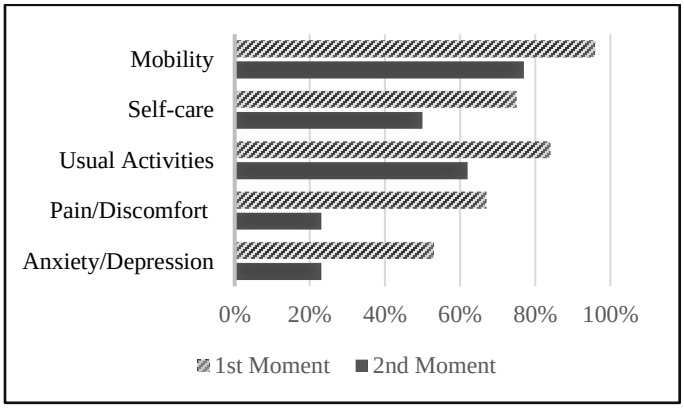

Figure 4 – Relative frequencies for the health state improvement dimensions of patients with some and extreme problems (EQ-5D levels 2 and 3 of severity, n = 48)

(Source: prepared by the author)

To better understand these values, based on the same results present in Table 43 in Annex 4, Figure 4 presents the frequencies of patients with some and extreme problems in the first and second moment of the questionnaire application.

Mobility is the most critical one, is the dimension where patients continue to have several difficulties even after the 30 days of treatment. These results were expected due to the advanced age of the sample, even with the medical treatments this dimension would probably be always the most difficult to resolve, along with the Usual Activities for the same reason. Pain and

Discomfort are the showing the greatest improvement among the dimensions, probably because, regardless of other factors, the treatments are actually showing some results.

4.6.2. Self-evaluated Health Status Improvement

Within a classification between 0 and 100, these long-term care patients evaluated their own health state that day with an average of 57,19 and 66,88 at the first and second data collection moments, respectively.

Table 8 - Descriptive analysis of Self-evaluated Health Status Improvement

	1st Moment	2nd Moment
N	48	48
Minimum	10	30
Maximum	90	90
Std. Deviation	19,51	16,87
Mean	**57,19**	**66,88**

(Source: prepared by the author)

Although some patients had classified their health state with a lower value after the 30 days, the comparison is characterized with an increase between those moments: generality, 17% of the patients were feeling better on the second moment than in the first one.

This improvement is showing that people are feeling better when close to the end of treatment. The reason for this improvement can come from medical reasons, the treatment is actually working and they feel better for just feeling differences in their health state.

4.7. Hypotheses' Testing for Independent Variables

As mentioned in the previous chapter, to use the Hypotheses' Testing in order to answer to the Investigation Questions, it is required to verify both assumptions regarding normality and homoscedasticity. The Kolmogorov-Smirnov and Shapiro-Wilk tests are conducted and then, if confirmed the normality assumption, then the Levine test is used to test the homoscedasticity (Marôco, 2014).

According to these tests, the null hypotheses (H_0) can be rejected with a significance level of 0,05 for a Sig. > 0,05 – in these cases, it is possible to conclude that the variable follows a Normal distribution (Laureano, 2011).

Considering the values presented in Annex 5, Tables from 35 to 42, the majority of the independent variables do not follow a Normal distribution for the several dimensions, with some exceptions: the independent variables "**Gender**", "**Age**" and "**Residence**" in the Reliability and in the final EQ-5D Health State Improvement dimensions; "**Network**" and "**Previous Institutionalization**" in the Reliability, the Empathy and in the final EQ-5D Health State Improvement; "**Living Arrangement**" in the Reliability dimension; "**Duration of Institutionalization**" in both Reliability and Empathy dimensions.

This way, it is necessary to conduct the Levine test to assess homoscedasticity of these variables in these dimensions. Obtained values with Sig. > 0,05 allow verifying the occurrence of the second assumption regarding the homoscedasticity of variances. To evaluate the influence of these characteristics, parametric tests will be conducted on the mentioned variables on the respective dimensions and non-parametric tests to the remainder.

4.7.1. Gender

The purpose is to verify if there is a statistically significant difference between the means of responses among the male and female patients. Both Mann-Whitney and *t*-student test were conducted for two independent samples (Marôco, 2014). To do so, was used H_0: $\mu_{Male} = \mu_{Female}$ versus $\mu_{Male} \neq \mu_{Female}$.

From the results on Table 9 and 10, for all of these dimensions Sig. > 0,05 and the null hypotheses is not rejected. Thus, it is possible to conclude that the patients' gender does not influences the perceived service quality, in all the five quality dimensions and global quality, neither their satisfaction or their final EQ-5D Health State Improvement and difference on Self-evaluated Health Status Improvement.

Table 9 - Mann-Whitney test for the independent variable "Gender" for dimension, global quality, satisfaction and self-evaluated health status improvement

Gender	Tangibility	Responsiveness	Assurance	Empathy	Global Quality	Satisfaction	Self-evaluated Health Status Improvement
Mann-Whitney U	281,500	245,000	270,500	258,500	251,500	263,500	271,000
Wilcoxon W	659,500	623,000	501,500	636,500	629,500	641,500	649,000
Z	-0,042	-0,806	-0,275	-0,522	-0,739	-0,421	-0,263
Asymp. Sig. (2-tailed)	0,966	0,420	0,783	0,602	0,460	0,674	0,793

(Source: prepared by the author)

Table 10 - t-student test for the independent variable "Gender" for the reliability dimension and health states improvement

Gender		Reliability	Health State Improvement
Levene's Test	F	3,668	0,001
	Sig.	0,062	0,979
t-student for equality of means with equal variances assumed	T	-0,178	-0,715
	Df	46	46
	Sig. (2-tailed)	0,860	0,478

(Source: prepared by the author)

The results suggest the total rejection of H1a, H1b, H4, H8a, and H8b.

4.7.2. Age

To test the hypotheses H1a, H1b, H4, H8a, and H8b, resorting once again to Mann-Whitney and *t*-student tests, where H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i,j = {64 years old or less, 65 years old or more}).

According to Tables 11 and 12, the perceived service quality is not influenced by the age of the patients, not rejecting the null hypotheses for all the five quality dimensions, satisfaction dimension and global quality. In the same way, this independent variable does not have influence

in the Health State Improvement and neither in the difference on Self-evaluated Health Status Improvement.

Table 11 - Mann-Whitney test for the independent variable "Age" for dimension, global quality, satisfaction and self-evaluated health status improvement

Age	Tangibility	Responsiveness	Assurance	Empathy	Global Quality	Satisfaction	Self-evaluated Health Status Improvement
Mann-Whitney U	145,000	148,500	138,000	134,000	198,500	140,500	175,500
Wilcoxon W	211,000	214,500	204,000	200,000	901,500	206,500	878,500
Z	-1,459	-1,359	-1,636	-1,713	-0,136	-1,564	-0,695
Asymp. Sig. (2-tailed)	0,145	0,174	0,102	0,087*	0,892	0,118	0,487

*. Significant at a 0,1 level

(Source: prepared by the author)

Table 12 - t-student test for the independent variable "Age" for the reliability dimension and health states improvement

Age		Reliability	Health State Improvement
Levene's Test	F	1,168	0,001
	Sig.	0,285	0,979
t-student for equality of means with equal variances assumed	T	-0,747	-0,715
	Df	46	46
	Sig. (2-tailed)	0,459	0,478

(Source: prepared by the author)

These results suggest the rejection of investigation hypotheses H1a, H1b, H4, H8a, and H8b for independent variable "age".

It is essential to notice that, for a confidence interval of 90%, the H_0 for the Empathy dimension would be rejected once Sig. would be lower than 0,05. On Table 49, in Annex 8, it is possible to observe the values for this possibility. Observing the medians – considering the sample's size – would be possible to find some significant differences on their perceptions and conclude that people with 65 years old or more have a higher perception of personnel' empathy. Younger patients' are probably more demanding when evaluating the individual attention and the personalized service provided by the personnel. However, the decision continues for the rejection of H1a.

4.7.3. Residence

To test the H1a, H1b, H4, H8a, and H8b, regarding the independent variable "residence", was used the Mann-Whitney test and the *t*-student test, by having: H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {Lisboa and Vale do Tejo, Outside Lisboa and Vale do Tejo}).

The values from Table 13 and Table 14 point to the rejection of H_0 for the Global Quality and Satisfaction, once Sig. < 0,05. For the remaining dimensions, the null hypotheses is not rejected. This means that the residence of these long-term care patients influences both their global quality perception and satisfaction, but it is not able to influence perceived service quality in the five quality dimensions or their health-related quality of life.

Table 13 - Mann-Whitney test for the independent variable "Residence" for dimension, global quality, satisfaction and self-evaluated health status improvement

Residence	Tangibility	Responsiveness	Assurance	Empathy	Global Quality	Satisfaction	Self-evaluated Health Status Improvement
Mann-Whitney U	125,500	170,000	151,500	134,500	126,500	109,000	170,000
Wilcoxon W	191,500	236,000	217,500	200,500	192,500	175,000	873,000
Z	-1,946	-0,828	-1,299	-1,701	-2,098	-2,346	-0,832
Asymp. Sig. (2-tailed)	0,052*****	0,408	0,194	0,089	**0,036****	**0,019****	0,405

*. Significant at a 0,1 level

**. Significant at a 0,05 level

(Source: prepared by the author)

Table 14 - t-student test for the independent variable "Residence" for the reliability dimension and health states improvement

Residence		Reliability	Health State Improvement
Levene's Test	F	2,217	2,776
	Sig.	0,143	0,102
t-student for equality of means with equal variances assumed	T	1,446	0,088
	Df	46	46
	Sig. (2-tailed)	0,155	0,931

(Source: prepared by the author)

The results lead towards the partial rejection of H1a and H4, once "residence" does influence global quality and satisfaction but not the remaining dimensions.

For a higher confidence interval, the H_0 of Tangibility would be also rejected. Observing the values presented in Table 50, Annex 8, there would be significant differences among the patients' perceptions. Observing the median, people who are from Lisboa and Vale do Tejo have a higher consideration for the physical aspects and appearance of the unit than those who are from outside Lisbon and Vale Tejo. This might happen probably because these patients, due to the distance, are not able to receive visits from family or friends, what might influence the way they perceived the physical aspects. Yet, the decision is still the rejection of H1a for the Tangibility dimension.

As mentioned in the previous chapter, by rejecting the null hypotheses and assuming that there is, at least, one population mean different from the remaining, an analysis resorting statistics *post-hoc* tests could be performed in order to understand in which pairs of mean these significant differences occur. However, in this case, there is no point for a means comparison once there are only two categories of grouping values and the Mann-Whitney test already indicates the difference between these two groups. On Table 47, Annex 8, the values suggest that patients with residence in Lisboa and Vale do Tejo tend to attribute a higher rate for both global quality and satisfaction, concluding that patients from further areas tend to perceive a lower global quality and lower satisfaction with the service.

4.7.4. Education Level

The independent variable "education level" is tested resorting the Kruskal-Wallis test and ANOVA *one-way* test, by having: H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {4^{th} year of schooling or less, between 6^{th} and 12^{th} year of schooling, bachelor's degree or more}).

In Tables 15 and 16, the null hypotheses is not rejected as there are no evidence of significant differences in the patients' perceptions among patients with different degrees of schooling completed. It is then possible to state that their education level does not influence the perceived service quality in the five dimensions or global quality, as well as in their satisfaction or health-related quality of life.

Table 15 -Kruskal-Wallis test for the independent variable "Education Level" for dimensions, global quality, satisfaction and health states and self-evaluated health status improvement

Education Level	Tangibility	Responsiveness	Assurance	Empathy	Global Quality	Satisfaction	Health State Improvement	Self-evaluated Health Status Improvement
Kruskal-Wallis H	2,516	1,651	0,797	0,164	4,371	0,108	2,149	0,253
df	2	2	2	2	2	2	2	2
Asymp. Sig.	0,284	0,438	0,671	0,921	0,112	0,947	0,342	0,881

(Source: prepared by the author)

Table 16 – ANOVA *one-way* test for the reliability dimension

Education Level	ANOVA	Sum of Squares	Df	Mean Square	F	Sig.
Reliability	Between Groups	0,574	2	0,287	0,428	0,654
	Within Groups	30,172	45	0,670		
	Total	30,747	47			

(Source: prepared by the author)

The results suggest the rejection of H1a, H1b, H4, H8a, and H8b.

4.7.5. Living Arrangement

The purpose is to evaluate the effect of the independent variable "living arrangement" on perceived service quality, satisfaction and the health-related quality of life improvement. To do so the Mann-Whitney test and *t*-student tests will be used to test the hypotheses H1a, H1b, H4, H8a, and H8b: H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {with someone, alone}).

Tables 17 and 18 show that there are statistically significant differences, which leads to rejecting the null hypotheses for the dimension Satisfaction. As for the remaining constructs, once Sig. > 0,05, H_0 is not rejected.

These results allow concluding that the level of satisfaction with the service is different among the patients who were living with familiar relative or similar before the institutionalization and those who were living alone. As mentioned in subsection 4.7.3, by rejecting the null hypotheses one is assuming a significant difference in, at least, one population mean. Since it is a question regarding two grouping values, no *post-hoc* tests are needed as well. According to values on Table 48 in Annex 8, patients who were living with familiar relative or similar before the

institutionalization tend to rate satisfaction lower than the other patients. Patients who were living alone have a higher perceived level of satisfaction with the service.

These results point towards the direction of partial rejection of H1a, once "living arrangement" influence satisfaction but not the other dimensions.

There is no evidence that the living arrangement is able to influence the level of perceived service quality in the five dimensions or global quality, or the health-related quality of life. This leads to the rejection of H1b, H4, H8a and H8b.

Table 17 - Mann-Whitney test for the independent variable "Living Arrangement" for dimension, global quality, satisfaction and self-evaluated health status improvement

Living Arrangement	Tangibility	Responsiveness	Assurance	Empathy	Global Quality	Satisfaction	Health State Improvement	Self-evaluated Health Status Improvement
Mann-Whitney U	261,000	249,500	240,000	280,000	237,500	189,000	223,000	264,000
Wilcoxon W	537,000	525,500	516,000	556,000	513,500	465,000	499,000	540,000
Z	-0,556	-0,790	-0,998	-0,156	-1,146	-2,057	-1,331	-0,491
Asymp. Sig. (2-tailed)	0,578	0,429	0,318	0,876	0,252	**0,040**	0,183	0,623

(Source: prepared by the author)

Table 18 - t-student test for the independent variable "Living Arrangement" for reliability dimension

Living Arrangement		Reliability
Levene's Test	F	0,205
	Sig.	0,653
t-student for equality of means with equal variances assumed	T	-1,135
	Df	46
	Sig. (2-tailed)	0,262

(Source: prepared by the author)

4.7.6. Network

To understand the influence that the independent variable "network" has in the patients' judgement, resorting the Mann-Whitney and *t*-student tests, the hypotheses H3a, H3b, H6, H10a and H10b will be tested, where: H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {public, private}).

According to the presented results on Tables 19 and 20, there are no statistically significant differences among the different dimensions and, therefore, the null hypotheses is not rejected. This allows concluding that patients receiving treatments under the RNCCI and patients in private network perceived the service in the same way, no significant differences were found

among these patients in evaluation the global service quality and all the five quality dimensions. There are no evidence of the network impact regarding patients' satisfaction and for the health-related quality of life improvement as well.

Table 19 - Mann-Whitney test for the independent variable "Network" for dimension, global quality, satisfaction and self-evaluated health status improvement

Network	Tangibility	Responsiveness	Assurance	Global Quality	Satisfaction	Self-evaluated Health Status Improvement
Mann-Whitney U	212,500	283,000	284,000	229,500	225,500	276,500
Wilcoxon W	488,500	608,000	609,000	505,500	501,500	552,500
Z	-1,574	-0,094	-0,074	-1,330	-1,295	-0,230
Asymp. Sig. (2-tailed)	0,116	0,925	0,941	0,184	0,195	0,818

(Source: prepared by the author)

Table 20 - t-student test for the reliability and empathy dimension, and health state improvement

Network		Reliability	Empathy	Health State Improvement
Levene's Test	F	0,100	1,252	0,006
	Sig.	0,753	0,269	0,941
t-student for equality of means with equal variances assumed	T	-0,366	-0,277	-0,053
	Df	46	46	46
	Sig. (2-tailed)	0,716	0,783	0,958

(Source: prepared by the author)

The results suggest the rejection of H3a, H3b, H6, H10a and H10b.

4.7.7. Previous Institutionalization

With the variable "previous institutionalization" it is intended to analyse the hypotheses H2a, H2b, H5, H9a, and H9b, given that H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {yes, no}). Resorting once again to the Mann-Whitney and *t*-students tests, the decision is towards the non-rejection of the null hypotheses. It is then possible to state that a previous institutionalization of the patient does not influence his perception of the service. This variable has no influence in the five quality dimensions and global quality, the satisfaction is not influenced as well and neither their health-related quality of life.

Table 21 - Mann-Whitney test for the independent variable "Previous Institutionalization" for dimension, global quality, satisfaction and self-evaluated health status improvement

Previous Institutionalization	Tangibility	Responsiveness	Assurance	Global Quality	Satisfaction	Self-evaluated Health Status Improvement
Mann-Whitney U	282,000	216,000	271,000	268,000	233,000	229,500
Wilcoxon W	633,000	567,000	524,000	619,000	584,000	580,500
Z	-0,084	-1,459	-0,316	-0,414	-1,110	-1,184
Asymp. Sig. (2-tailed)	0,933	0,144	0,752	0,679	0,267	0,237

(Source: prepared by the author)

Table 22 -t-student test for reliability and empathy dimension, and health state improvement

Previous Institutionalization		Reliability	Empathy	Health State Improvement
Levene's Test	F	3,348	1,900	0,264
	Sig.	0,074	0,665	0,610
t-student for equality of means with equal variances assumed	t	0,809	-0,443	0,198
	Df	46	46	46
	Sig. (2-tailed)	0,423	0,660	0,844

(Source: prepared by the author)

These results suggest the rejection of H2a, H2b, H5, H9a, and H9b.

4.7.8. Duration of Institutionalization

Regarding the independent variable "duration of institutionalization", and in order to test the hypotheses H2a, H2b, H5, H9a, and H9b, both Kruskal-Wallis test and ANOVA *one-way* test are conducted with: H_0: $\mu_i = \mu_j$ versus H_1: $\mu_i \neq \mu_j$ ($i \neq j$ and i.j = {less than 1 week, between 1 week and 2 weeks (inclusive), more than 2 weeks}).

As is possible to observe in Tables 23 and 24, the null hypotheses is also not rejected. These results allow concluding that the duration of institutionalization does not influence the perceived service quality in the five dimensions or global quality. This variable also has no influence on the patients' satisfaction concerning the service and neither in their health-related quality of life.

Table 23 - Kruskal-Wallis test for the independent variable "Duration of Institutionalization" for dimensions, global quality, satisfaction and health states and self-evaluated health status improvement

Duration of Institutionalization	Tangibility	Responsiveness	Assurance	Global Quality	Satisfaction	Health State Improvement	Self-evaluated Health Status Improvement
Kruskal-Wallis H	0,176	1,158	2,726	0,177	0,403	2,192	0,027
df	2	2	2	2	2	2	2
Asymp. Sig.	0,916	0,561	0,256	0,915	0,817	0,334	0,987

(Source: prepared by the author)

Table 24 - ANOVA *one-way* test for the independent variable "Duration of Institutionalization" for reliability and empathy dimension

Duration of Institutionalization	ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Reliability	Between Groups	1,682	2	0,841	1,302	0,282
	Within Groups	29,065	45	0,646		
	Total	30,747	47			
Empathy	Between Groups	0,285	2	0,143	0,173	0,842
	Within Groups	37,127	45	0,825		
	Total	37,413	47			

(Source: prepared by the author)

The results suggest the total rejection of H2a, H2b, H5, H9a, and H9b.

4.8. Satisfaction

In Chapter 2 of the present dissertation, it is mentioned the relationship between service quality and customer satisfaction and its significant relevance discussed in several investigations, such as Babakus and Mangold (1992) and Babakus and Mangold (1992). Moreover, Andaleeb (2001) and Chatzoglou *et al.* (2014) suggested items to measure the Satisfaction construct.

Table 25 presents the 5 items that build this construct and those values allow to understand the origin of the patients' satisfaction level and its potential critical aspects.

Table 25 – Results of Satisfaction construct

Satisfaction	Mean
P24. I am willing to recommend the service of this Long-Term Care Unit to a friend or family member	6,40
P25. I am willing to return, if necessary, to the service of this Long-term Care Unit	6,56
P26. The comments I make about the service provided in this Long-term Care Unit, when talking to others, are positive	5,96
P27. I do not intend to stop receiving the healthcare services provided in this Long-term Care Unit, while I need them	6,40
P28. This Long-term Care Unit is my first choice due to the service it offers	6,33
Global Level of Satisfaction	**6,33**
SD	**0,64**

(Source: prepared by the author)

It is possible to observe that the item with higher level is the **P25**, meaning that patients are extremely available to return to this long-term care unit if necessary. The item with lower results is the **P26**, where patients agree less with the statement when asked about the comments they make regarding the unit. They admitted that probably the comments they do about the service provided are not always positive, although, their level of satisfaction is strongly high. Patients are generally very satisfied with the service, with a global level of satisfaction very close to the maximum point of scale (6,33 in a maximum of 7) and extremely willing to recommended it to a friend or family.

4.9. Association between Global Quality and Satisfaction

Concerning the investigation hypotheses H7, the aim is to analyse if there is an association between the perceived global quality and the level of satisfaction by those long-term patients. To do so, the Spearman correlation coefficient was computed. Observing the values on Table 44 in Annex 7, it was concluded that the two variables do not follow a normal distribution and, therefore, it was not possible to use the Pearson correlation coefficient.

Table 26 - Spearman's correlation coefficient for global quality and satisfaction

			Global Quality	Satisfaction
Spearman's rho	Global Quality	Correlation	1,000	**0,649**
		Sig. (2- tailed)		0,000
		N	48	48
	Satisfaction	Correlation	**0,649**	1,000
		Sig. (2- tailed)	0,000	
		N	48	48

(Source: prepared by the author)

As shown in Table 26, this correlation coefficient is 0,649 and p-value is 0,000, proving there is a positive, significant and quite strong relationship between the perceived global service and the patients' satisfaction (Marôco, 2014). Consequently, the H7 cannot be rejected.

4.10. Association between Health State Improvement and Self-evaluated Health Status Improvement

To conduct the analysis to the H11, the purpose is to verify if there is an association between the two measures of the EQ-5D instrument, the Health State Improvement and the Self-evaluated Health Status Improvement, the visual analogue scale. From what is possible to see in Table 45 in Annex 7, the two variables do not follow a Normal Distribution, so the Spearman correlation coefficient was used to this analysis.

Table 27 - Spearman's correlation coefficient for health state improvement and self-evaluated health status improvement

			Health State Improvement	Self-evaluated Health Status Improvement
Spearman's rho	Health State Improvement	Correlation	1,000	**0,527**
		Sig. (2- tailed)		0,000
		N	48	48
	Self-evaluated Health Status Improvement	Correlation	**0,527**	1,000
		Sig. (2- tailed)	0,000	
		N	48	48

(Source: prepared by the author)

With a correlation coefficient of 0,527, it is possible to conclude for the existence of a positive, significant and moderate relationship between these two components (Marôco, 2014). EQ-5D

Health State Improvement and Self-evaluated Health Status Improvement are indeed associated, and the decision is for the non-rejection of H11.

4.11. Association between the Global Quality and Health State Improvement

In order to verify if there is an association between the Global Quality and the Health State Improvement, obtained through the SERVPERF and EQ-5D instruments, respectively, H12 is tested.

Table 28 -Spearman's correlation coefficient for global quality and health state improvement

			Global Quality	Health State Improvement
Spearman's rho	Global Quality	Correlation	1,000	**0,038**
		Sig. (2- tailed)		**0,800**
		N	48	48
	Health State Improvement	Correlation	**0,038**	1,000
		Sig. (2- tailed)	**0,800**	
		N	48	48

(Source: prepared by the author)

The Spearman's correlation coefficient is the appropriate analysis for this hypothesis, as justified in Table 46, Annex 7. Then, in Table 28, the values stand for the existence of a correlation of 0,038 but, opposing to the previous cases, p-value > 0,05. The decision is the non-rejection of H12, and so these results allow to conclude that there is, in fact, a slight relationship between the global quality and the health state improvements, but this relationship is not significant.

4.12. Discussion

This research intents to report the perceived service quality and the health-related quality of life in patients under a long-term care service. Theoretically, both SERVPERF and EQ-5D identify several dimensions that are important to patients but, at this population level, patients showed some special considerations for some of those dimensions.

Regarding the perceived service quality using the SERVPERF, perceptions of service quality are slightly weaker for the Reliability and Responsiveness, when evaluating items related to readiness and waiting times to receive the services, P5, P8, and P11 must be reviewed with some attention. The lower results for these items turned out to be surprising given the nature of the treatments in which all patients have their day filled with activities and medical appointments, all properly scheduled. This might represent some concerns, not related with treatments or appointments, but with the basics daily details provided. It is possible that patients have some displeasure in waiting to go to the bathroom or to do their hygiene, or even to get some help in daily activities. Actually, some patients had mentioned that the service seems to be different between patients who have better mobility than those with some problems.

Still evaluating the perceived service quality, some of the patients' characteristics have proved to be significant in understanding the patients' perceptions of the service quality. Levinton *et al.* (2011), analysed the importance of the residence in the patients' satisfaction, with patients residing inside and outside Toronto. Similarity to this research, was concluded that where the patients reside proved to impact their perceptions of care service delivered and satisfaction. Curiously, patients' with residence outside Lisboa and Vale do Tejo not only have a lower perception of the service global quality as well as a lower level of satisfaction than the remaining patients. First, these patients may rate more poorly the service quality and their satisfaction by thinking that hospitals provide better service in their city. Second, this probably happens due to the fact that these patients did not have their relatives and friends around. Not receiving visits and neither spending time with them, at least frequently, might be influencing the way they feel at the long-term care and, consequently, having impact on their perceptions of the service.

The patients' living arrangement was also showing interesting results. For those patients' that were living with some relative or similar before the institutionalization, the level of satisfaction is lower than the other patients' level. It is possible that those patients were probably accustomed to additional comfort and more attention and might now be more demanding (want similar individual attention). On the other hand, those who were living alone might now have a greater focus of the health service provided and not so much on the attention by the service suppliers.

The analysis of duration and previous institutionalization did not come up with results that could be expected to. Patients normally have a fast progress at the beginning of the treatment and then

it tends to stabilize. The study was applied to respondents in the begging of their treatment but some differences could be expected among patients interviewed in their first day at the unit and patients with an institutionalization of a week, for example, regarding their self-evaluation of the health status. But no significant results were found regarding the duration of their institutionalization. Also, Zarei *et al.* (2012) defended that a previous hospitalization in the current hospital impacts the patients' expectations and, consequently, their perception about the service quality. The sample was quite balanced in terms of patients in their first institutionalization and patients with a previous institutionalization in the current unit, however, no significant differences were concluded.

Additionally, another unexpected result was regarding the network characteristic. Would not be surprising to notice some differences in the perception service quality, level of satisfaction or even in health-related quality of life improvement between patients under private system and those under the public network. In this unit, the private and public networks are divided into different flanks and the daily service is provided by different healthcare professionals and, in doing so, would be possible to find differences on their perceptions regarding the quality and their satisfaction with the service. From similar perspective, Li *et al.* (2015), defended that the patients perceived service quality and satisfaction are related to the service awareness and the abilities of the healthcare professionals are the key factor to improve the service quality. One possible justification for these similar results among different systems can be regarding the processes and policies established by the hospital. The healthcare professionals from both flanks have instructions of certain mandatory procedures and these are probably fairly conducted and in an impartial way. Besides that, patients have commonly appointments with the same healthcare professionals.

The investigation of Zamil *et al.* (2012) concluded that the less sophistication, high bureaucracy, overcrowding lines, and long waiting process made in the public system are resulting in lower classifications when comparing with the private sector. One possible justification for these results can be regarding the processes and policies established by the hospital. This long-term care unit has agreements with several insurers, health systems, and companies, allowing different ranges of patients to have access to the unit services, where public and private bureaucracy is probably

treated in the same manner. Resorting to the conclusions of Zamil *et al*. (2012), the less sophistication or overcrowding lines are probably not so significant in this hospital.

Besides that, in this case, there are several details that could impact the perception of the service. For example, most of the private patients are hospitalized in single rooms with a totally different level of privacy. Moreover, these patients are paying a different monthly fee and they could question themselves whether the service is worth the investment. Mahapatra (2013) and Al-Neyadi *et al.* (2018) defended that, nowadays, the private sector still has an edge over the public one, the general notion is that private hospitals provide better services. However, these researchers also believe that this notion is becoming questionable. Their results meet the conclusions of the present investigation: the results were no clear about the distinction on patients' satisfaction or their service evaluations. Actually, their conclusion was that both services were similarly served adequately, as concluded in the present research. Curiously, Chari *et al.* (2016) mentioned that patients who were hospitalized only in a public hospital before, tend to choose private hospitals more often than those who have already experienced both public and private hospitals. Suggesting that probably there have been some changes in mind-sets.

From what was observed and accomplished from the investigation results, the service provided under the public network (National Network for Long-Term Care) is quite good. It is possible that, even with lower fees and revenues received from the public network when compared with the private system, the healthcare professionals do not fail in providing the best possible service, regardless the network.

Finally, the patients' satisfaction is particularly high. Resorting to the research of Andaleeb (2001), this mentioned that patients' education may be a decisive factor to determinate their satisfaction. In his perspective, patients have a crucial role in the process of the service delivery and, if this role is not conducted properly, that might impact the service received. Considering this, it is possible that these high values of patients' satisfaction are resulting from the sample education level. As concluded in the previous chapter, this was a quite well-educated sample – which was also a surprising result – where patients 40% of patients have at least a bachelor's degree. Patients with good form education are more likely to have better education on health issues and skills to take charge and to pay special attention to their own health, what probably can impact their perception of satisfaction.

4.13. Conclusions

Through this chapter, resorting to the statistical and exploratory analysis of the 48 valid responses, perceived service quality, patients' satisfaction and health-related quality of life in long-term care services have been evaluated.

The sample was fairly balanced in terms of gender and patients under the public and private network, but mainly composed by patients over 65 years old and patients from Lisboa and Vale do Tejo (both around 77% of the patients). Regarding the service, the sample was characterized by patients who were starting their treatments (only 29% were there for longer than 2 weeks when questioned) and 46% were there for the second time or more. The collected sample was also a well-educated sample, where 40% of those patients completed, at least, a bachelor's degree. Another analysed variable was the living arrangement in order to understand the patients' background, getting once again a balanced sample among the different situations.

Firstly, was verified, resorting to the Cronbach's Alpha, that all SERVPERF dimensions and the Satisfaction construct were strongly reliable to measure the perceived service quality and satisfaction of patients receiving long-term care services. An additional test was also conducted to the Satisfaction construct, in order to understand the reliability contribute from each item. The conclusion was that the five items together give a better reliability to the dimension that if one item was individually removed.

Was conducted an analysis in order to evaluate how the health-related quality of life is perceived by the long-term care patients. The results were high and the improvement between the two moments of application is notable. Patients also have a high perception of the service quality, the analysis through the SERVPERF questionnaire resulted in a quite high level of patients' global quality.

Resorting to the statistical tests, it was verified that service characteristics – network, previous institutionalization and duration of institutionalization – do not influence the perception of service quality neither the patients' satisfaction nor the health-related quality of life. On the other hand, some patients' characteristics showed to have an influence on some of the dimensions considered. The patients' residence was the only variable to show an impact on the perceived global quality: for patients with residence outside Lisboa and Vale do Tejo area, the service

quality is perceived with lower levels. Concerning the patients' satisfaction, this dimension is influenced by two variables, the residence, once again, and the living arrangement. Patients from Lisboa and Vale do Tejo and patients' who were living alone before institutionalization shown higher levels of satisfaction than those patients from the remaining areas and those who were living with someone.

Patients revealed to be significantly satisfied with the service in the long-term care unit – a strong level of satisfaction with a mean of 6,33 out of 7. This satisfaction level is not only higher than the perception of global quality but also higher than all the five quality dimensions.

When analysing the relationship between the global quality and satisfaction, H5 was not rejected and a strong association between these two variables was found resorting to a Spearman's correlation coefficient. The same analysis was conducted regarding the health-related quality of life and was possible to verify the existence relationship between the Health State Improvement (EQ-5D index) and the Self-evaluated Health Status Improvement (EQ-5D VAS). Nonetheless, when trying to associate the global quality with the Health State Improvement, it is also possible to verify some relationship, however, a not significant one.

To sum up, in order to better understand the results of the tested hypotheses, Table 29 presents the decisions:

Table 29 – Summary of hypotheses' decision

H1	**Partial rejection of H1a** - rejection for "residence", non-rejection for the remaining independent variables
H2	Rejection
H3	Rejection
H4	**Partial rejection of H4** - rejection for "residence" and "living arrangement", non-rejection for the remaining independent variables
H5	Rejection
H6	Rejection
H7	**Non-rejection**
H8	Rejection
H9	Rejection
H10	Rejection
H11	**Non-rejection**
H12	**Non-rejection**

(Source: prepared by the author)

5. Conclusions

This chapter highlights the main conclusions of this research. The research questions will be answered as well as discussed the achievement of the objectives proposed in Chapter 1, resorting to the analysis in the previous one.

5.1. Answers to the Research Questions

5.1.1. Question 1

"What is the customers' perception about both health-related quality of life and service quality provided by the Long-term Care Unit?"

Through the descriptive analysis undertaken in the previous chapter, it was verified that the level of the overall perceived service quality (global quality, P23) is positive and surely high (6,08 in a maximum of 7). In general, patients showed high considerations regarding the service provided, as is possible to conclude from the level of perceived service quality in all the 5 dimensions suggested by Parasuraman *et al*. (1988).

Resorting to the service quality dimensions, all the five present high levels of perceived quality. *Assurance* has the highest value, almost close to the maximum (6,24 in a scale from 1 to 7), right followed by *Tangibility* with 6,18. Both of these dimensions present a higher perceptions of quality than the perceived global quality. Patients really appreciate the physical and tangibles aspects of both facility and personnel' appearance. More than that, patients were proving that actually have confidence not only in the service provided but also with their relationship with the healthcare professionals. On the other hand, as also concluded in the previous chapter, the dimension with lower perception is the *Reliability* followed by *Responsiveness* (with 5,63 and 5,72, respectively). Besides their confidence in the service and personnel, patients consider that their availability and ability to provide a prompt service at the promised time needs need to be improved.

In a more deeply perspective through the items, the results meet the conclusions about the dimensions of service quality. The most critical items are referring to the information about the time of the service delivery (if they inform accurately about the time that the service will be

provided and if they keep those promises). The items with higher perception of quality are related to the patients' confidence in the service provided and the good appearance of the personnel.

Concerning the health-related quality of life, despite the sensitivity of the treatments and patients' health status, the patients present positive results. In the *Health State Improvement*, the most preoccupying dimension is *Mobility* in which 96% of the patients presented problems in walking when the health care services were still only beginning to be applied. This value was improved during the 30 days of treatment, in which 75% still present some problems in the mobility. As previously explained, ultimately it was expected given the sample composed of elderly people. For the same reason, the improvement in *Self-care* and *Usual Activities* is also smaller. Despite the service provided and patients' perceptions, was ultimately expected a slight improvement in these dimensions. Nonetheless, even knowing the patients' physical condition, there was a progress in this specific indicator.

The most remarkable improvement is regarding the *Pain/Discomfort* dimension, verifying a strong decrease in the number of patients with still some pain or discomfort after the 30 days of treatment. Close to these values, *Anxiety/Depression* also show significant improvements. Patients probably feel more relieved for the end of the treatment.

Regarding the *Self-evaluated Health Status Improvement*, the balance is also quite positive. Although at the beginning of the treatment patients were feeling good (with a mean self-evaluation of 57,19% in a total of 100), they were feeling even better 30 days latter (with 66,88%). This part of the questionnaire is more subjective once is considering the self-evaluation of the patients' health status that specific day. Nonetheless, and despite their sensitive health state, patients were actually feeling quite good.

The service characteristics – previous institutionalization and duration of institutionalization – did not indicate to influence how the service quality is perceived, neither influence the patients' satisfaction. However, as already analysed before, patients' residence and living arrangement seems to impact their perceived global quality and satisfaction, but the other variables – gender, age, and education level – did not show significant results. In terms of health-related quality of life improvement, no statistically differences were find neither among patients' characteristics nor service characteristics in influencing the health state and health status improvement self-assessed by patients.

Therefore, the research question 1 is answered and the specific objectives 1 and 2 are accomplished.

5.1.2. Question 2

"Is there an association between the perceived service quality and the level of satisfaction with the service received?"

As presented in the previous chapter, the correlation coefficient obtained of 0,649 provides valid support to the existence of a positive and significant relationship between perceived global service quality and patients' satisfaction.

This points towards the non-rejection of H7 and question 2 is answered.

5.1.3. Question 3

"Is there an association between health-related quality of life and perceived service quality?"

As identified in the first chapter, one of the mail goals of this investigation is to jointly analyse the perception of service quality and the health-related quality of life, concluding how these two concepts might be associated.

The correlation coefficient found between the perceived global quality and the health state improvement (EQ-5D Index) of 0,038 allow to conclude that this is a slight relationship between these two dimensions. However, the Sig. > 0,05 leads to the conclusion that this relationship is not significant.

Accordingly, question 3 is answered and the decision is for the non-rejection of H11.

5.1.4. Question 4

"How is perceived the service quality and health-related quality of life between patients receiving long-term care in public and private networks?"

One of the most interesting questions, when evaluating the perceived service quality, is to understand how the service might be differently perceived between patients under the public and private services. Moreover, even the health-related quality of life as perceived by these patients might present some differences. As explained before, this long-term care has different flanks considering the patients network and the sample is representing in a balanced way the patients from the two systems. The daily basis services are provided by different healthcare professionals between the two flanks.

Regardless the different characteristics among the service provided between these two groups of patients, no statistically significant differences were found to prove that perceived service quality, patients' satisfaction or health-related quality of life improvement are differently perceived by these patients. It is possible to conclude that probably both services were similarly served adequately.

Question 4 is answered, the H3, H6 and H10 are rejected.

5.1.5. Question 5

"Which managerial recommendations in the service delivery can improve the perceived service quality and the perceived health-related quality of life?"

After analysing the patients' perception regarding the perceived service quality and health-related quality of life, it is possible to propose some managerial recommendations to improve these perceptions.

Through the quality dimensions, the lower perception of the patients about the quality of the service is in the capacity of response. The ability of healthcare professionals to report the exact time the service will be delivered, to keep promises about the time to provide some service, and to provide immediate care are some aspects that the long-term care unit should be improved. Patients usually have a fairly high perception of the service, but the responsiveness of the service

is clearly one area to improve. It is important to provide information as accurate as possible and to provide service in a short time after it is required by the patient. To do so, all the health professionals, including health aids, must be responsive to help patients with their basic needs, such as going to the bathroom or taking them to the dining hall. If necessary, the hospital should consider increasing the number of health professionals on duty during the periods of higher demand.

From another perspective, patients with residence outside Lisboa are perceiving the quality more poorly than the others. This can result from the fact that these patients, some of them from Trás-os-Montes and even from Madeira, do not receive visits from relatives or similar as often as the other patients. The long-term care unit can make the effort of trying to be sensitive with these cases and follow them closer so those patients, in doing it, may feel as at home as possible.

5.2. Limitations

One limitation of the results presented is the reduced number of elements in the sample. Nonetheless, considering the methodology of the research, as well as the sensitivity of the cases and advanced age of the patients, all the cases that could be included in the sample were actually included.

Moreover, the data was not randomly selected, and since it was by convenience and previously discussed, is not representative of the general population. The sample is the best possible and it represents the whole population suitable for the research – institutionalized in the long-term care unit during the collection period – though, no conclusions can be generalized, for the perceived service quality and health-related quality in long-term care units, in the Portuguese reality.

In a more technical perspective, the sample not always met the assumptions to the use of parametric tests. Resulting in another limitation, the results obtained resorting to the non-parametric tests may be less robust and less reliable conclusions. Nonetheless, the tests used are the ones theory considers the most appropriate ones for the conditions of this research.

5.3. Suggestions for Future Research

Following the mentioned limitations, it could be an interesting direction for future studies to attempt to generalize the investigation for other long-term care units, making possible a more complete analysis of the Portuguese long-term care context. Another possibility is also to include other healthcare services in this analysis, using both the perceived service quality and the health-related quality of life. The combination of these two instruments represents a key research opportunity, given the lack of literature in evaluating long-term care services.

The results obtained give interesting conclusions, recognizing that patients from outside Lisbon, and patients who were living with someone and those who were living alone tend to rate the service quality lower than the others. This could suggest new insights for new researches, where these associations can be conducted at a deeper extent.

Future research could analyse the health professionals separately when evaluating the perceived service quality. In this case, health professionals included doctors, nurses, health assistants, and social workers. Patients might have different perceptions among these professionals, even because of the frequency of contact with the patient is very different between them. Furthermore, the comparison between public and private networks is also a good starting point for a research with a significant sample.

Additionally, for future investigations could be curious to include the perspective of the patients' relatives or similar, and even to the health professionals. People who follow the service from another point of view can bring interesting inputs, so the comparison of those perspectives with the patients' evaluation could bring remarkable results.

To extend the investigation, the evaluation of the wellbeing using the ICECAP would be also a possibility. In fact, the combination of this instrument with the EQ-5D might provide largely different but complementary information.

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Annex

Annex 1 – Questionnaire

Evaluation of perceived service quality by the patients of the Long-Term Care Unit – Hospital do Mar, Serviços Especializados de Lisboa.

This questionnaire is an integrated part of a dissertation of the Master in Management of Services and Technology, at ISCTE-IUL. The purpose is to evaluate the service quality, as perceived by the patients, of the service delivered in the Long-Term Care Unit of Hospital do Mar.

To answer this questionnaire, patients must be, at least, 18 years old. The results will be confidential and there are no right or wrong answers.

Thank you in advance for your cooperation!

1. Patient Characterization

1.1. Gender: ☐ Male ☐ Female

1.2. Age: ☐ 18 a 24 years old ☐ 25 a 34 years old ☐ 35 a 44 years old
☐ 45 a 54 years old ☐ 55 a 64 years old ☐ 65 or more years old

1.3. Residence: ☐ Lisboa and Vale do Tejo
☐ Norte ☐ Centro ☐ Alentejo
☐ Algarve ☐ RA Açores ☐ RA Madeira

1.4. Education Level (completed):

☐ Cannot read or write
☐ Primary Education (4th year of schooling)
☐ 2nd Cycle of Basic Education (6th year of schooling)
☐ 3rd Cycle of Basic Education (9th year of schooling)
☐ High School (12th year of schooling)
☐ Bachelor's Degree
☐ Postgraduate Degree
☐ Master's Degree or higher

1.5. Professional Occupation:

- ☐ Student
- ☐ Self-employed
- ☐ Employed worker
- ☐ Unemployed
- ☐ Retired

1.6. Living with familiar or similar before the institutionalization?

☐ Yes ☐ No

2. Service Characterization

2.1. Network

☐ Public ☐ Private

2.2. Duration of institutionalization

- ☐ Less than 1 week
- ☐ Between 1 week and 2 weeks (inclusive)
- ☐ More than 2 weeks

2.3. Previous institutionalization at this unit?

☐ Yes ☐ No

1. EQ-5D

By placing a tick in one box in each group, please indicate which statements describe your own health state today.

Mobility

I have no problems in walking about ☐

I have some problems in walking about ☐

I am confined to bed ☐

Self-Care

I have no problems with self-care ☐

I have some problems washing or dressing myself ☐

I am unable to wash or dress myself ☐

Usual Activities *(e.g. work, study, housework, family or leisure activities)*

I have no problems with performing my usual activities ☐

I have some problems with performing my usual activities ☐

I am unable to perform my usual activities ☐

Pain/Discomfort

I have no pain or discomfort ☐

I have moderate pain or discomfort ☐

I have extreme pain or discomfort ☐

Anxiety/Depression

I am not anxious or depressed ☐

I am moderately anxious or depressed ☐

I am extremely anxious or depressed ☐

Indicate on this scale how good or bad your own health is today, in your opinion. To do so, a line must be drawn from the box below to whichever point on the scale indicates how your health state is today.

Best imaginable health state

Your own health state today

Worst imaginable health state

4. Perceived Service Quality

Given a scale from 1 to 7, where 1 means "Totally Disagree" and 7 means "Totally Agree", indicate your agreement level with each of the following statements:

	Scale						
	Totally Disagree						**Totally Agree**
P1. This Long-term Care Unit has modern looking equipment.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P2. The physical facilities of this Long-term Care Unit are visually appealing.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P3. The healthcare professionals of this Long-term Care Unit have neat appearance and appropriately dressed.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P4. The support equipment used by the healthcare professionals of this Long-term Care Unit has a neat and appealing aspect.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P5. When this Long-term Care Unit promises to do something at a certain time, it does so.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P6. As a patient, when you have a problem, this Long-term Care Unit shows determination in solving it.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P7. This Long-term Care Unit performs the service correctly at the first time it is requested.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P8. This Long-term Care Unit provides its services at the time it promises to do so.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P9. This Long-term Care Unit keeps your records updated and without flaws.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P10. This Long-term Care Unit informs you exactly when the service will be provided.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P11. The healthcare professionals of this Long-term Care Unit provide you a prompt service.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P12. The healthcare professionals of this Long-term Care Unit are always willing to help you.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P13. The healthcare professionals of this Long-term Care Unit are always available to answer promptly to your questions.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P14. The behaviour of the healthcare professionals in this Long-term Care Unit inspires confidence.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P15. As a patient, you trust in the service provided by the healthcare professionals of this Long-term Care Unit.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P16. The healthcare professionals of this Long-term Care Unit are always kind and polite with you.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P17. The healthcare professionals of this Long-term Care Unit know how to answer your questions.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P18. This Long-term Care Unit gives you individual attention.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P19. This Long-term Care Unit has an appropriated timetable for the different patients.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**

P20. The healthcare professionals of this Long-term Care Unit provide a personalized service.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P21. This Long-term Care Unit has your best interest at heart.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P22. The healthcare professionals of this Long-term Care Unit understand your specific needs.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**

Given a scale from 1 to 7, where 1 means "Very Low" and 7 means "Very High", answer the following question:

P23. Evaluation of the overall perceived service quality in the Long-Term Care Unit.	**Very Low**						**Very High**
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**

Given a scale from 1 to 7, where 1 means "Totally Disagree" and 7 means "Totally Agree", indicate your agreement level with each of the following statements:

P24. I am willing to recommend the service of this Long-Term Care Unit to a friend or family member.	**Totally Disagree**						**Totally Agree**
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P25. I am willing to return, if necessary, to the service of this Long-term Care Unit.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P26. The comments I make about the service provided in this Long-term Care Unit, when talking to others, are positive.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P27. I do not intend to stop receiving the healthcare services provided in this Long-term Care Unit, while I need them.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**
P28. This Long-term Care Unit is my first choice due to the service it offers.	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**

Annex 2 – Sample and Service Characterization

Table 30 - Frequencies for the independent variables of sample characterization

Independent Variable		AF	RF (%)
Gender	Male	21	44
	Female	27	56
	Total	**48**	**100**
Age	64 years old or less	11	23
	65 years old or more	37	77
	Total	**48**	**100**
Residence	Lisboa and Vale do Tejo	37	77
	Outside Lisboa and Vale do Tejo	11	23
	Total	**48**	**100**
Education	4th year of schooling or less	16	33
	Between 6th and 12th year of schooling	13	27
	Bachelor's degree or higher	19	40
	Total	**48**	**100**
Living Arrangement	With someone	23	48
	Alone	25	52
	Total	**48**	**100**

(Source: prepared by the author)

Table 31 - Frequencies for the independent variables of service characterization

Independent Variable		AF	RF (%)
Network	Public	25	52
	Private	23	48
	Total	**48**	**100**
Duration of Institutionalization	Less than 1 week	14	29
	Between 1 and 2 weeks	20	42
	More than 2 weeks	4	8
	Total	**48**	**100**
Previous Institutionalization	Yes	22	46
	No	26	54
	Total	**48**	**100**

(Source: prepared by the author)

Annex 3 – Descriptive Analysis of Perceived Service Quality and Satisfaction

Table 32 - Perceived service quality by item and dimension

	Mean	SD	Scale - RF (%)						
Tangibility	**6,18**	**0,791**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
P1. This Long-term Care Unit has modern looking equipment.	5,94	1,192	2,1	0	2,1	2,1	22,9	33,3	37,5
P2. The physical facilities of this Long-term Care Unit are visually appealing.	6,23	0,857	0	0	0	6,3	8,3	41,7	43,8
P3. The healthcare professionals of this Long-term Care Unit have neat appearance and appropriately dressed.	6,52	0,583	0	0	0	0	4,2	39,6	56,3
P4. The support equipment used by the healthcare professionals of this Long-term Care Unit has a neat and appealing aspect.	6,02	0,934	0	0	0	6,3	22,9	33,3	37,5
Reliability	**5,63**	**0,801**							
P5. When this Long-term Care Unit promises to do something at a certain time, it does so.	5,46	0,922	0	0	4,2	6,3	39,6	39,6	10,4
P6. As a patient, when you have a problem, this Long-term Care Unit shows determination in solving it.	6,19	0,938	0	0	0	6,3	16,7	29,2	47,9
P7. This Long-term Care Unit performs the service correctly at the first time it is requested.	5,50	1,111	0	0	8,3	4,2	35,4	33,3	18,8
P8. This Long-term Care Unit provides its services at the time it promises to do so.	5,35	1,021	0	0	6,3	10,4	35,4	37,5	10,4
P9. This Long-term Care Unit keeps your records updated and without flaws.	5,67	1,098	0	0	4,2	12,5	18,8	41,7	22,9
Responsiveness	**5,72**	**0,986**							
P10. This Long-term Care Unit informs you exactly when the service will be provided.	5,31	1,075	0	0	4,2	18,8	33,3	29,2	14,6
P11. The healthcare professionals of this Long-term Care Unit provide you a prompt service.	4,96	1,352	2,1	2,1	8,3	20,8	31,3	22,9	12,5
P12. The healthcare professionals of this Long-term Care Unit are always willing to help you.	6,38	1,084	2,1	0	0	4,2	2,1	33,3	58,3
P13. The healthcare professionals of this Long-term Care Unit are always available to answer promptly to your questions.	6,23	1,134	0	2,1	2,1	4,2	8,3	29,2	54,2
Assurance	**6,24**	**0,917**							
P14. The behaviour of the healthcare professionals in this Long-term Care Unit inspires confidence.	6,38	1,123	0	2,1	0	8,3	4,2	18,8	66,7
P15. As a patient, you trust in the service provided by the healthcare professionals of this Long-term Care Unit.	6,54	0,743	0	0	0	0	2,1	8,3	22,9
P16. The healthcare professionals of this Long-term Care Unit are always kind and polite with you.	6,02	1,313	0	4,2	2,1	6,3	10,4	29,2	47,9

P17. The healthcare professionals of this Long-term Care Unit know how to answer your questions.	6,02	1,082	0	2,1	0	4,2	22,9	29,2	41,7
Empathy	**5,76**	**0,892**							
P18. This Long-term Care Unit gives you individual attention.	6,06	1,313	0	0	2,1	4,2	18,8	35,4	39,6
P19. This Long-term Care Unit has an appropriated timetable for the different patients.	5,40	1,08	0	0	2,1	18,8	31,3	33,3	14,6
P20. The healthcare professionals of this Long-term Care Unit provide a personalized service.	6,04	0,976	0	0	2,1	2,1	22,9	35,4	37,5
P21. This Long-term Care Unit has your best interest at heart.	5,33	1,026	0	2,1	2,1	16,7	37,5	22,9	18,8
P22. The healthcare professionals of this Long-term Care Unit understand your specific needs.	5,98	0,944	0	0	4,2	4,2	14,6	43,8	33,3
P23. Evaluation of the overall perceived service quality in the Long-Term Care Unit.	**6,08**	**0,871**	0	0	2,1	4,2	8,3	54,2	31,3

(Source: prepared by the author)

Table 33 - Perceived service quality by item of satisfaction dimension

	Mean	**SD**	**Scale - RF (%)**						
Satisfaction	**6,33**	**0,644**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
P24. I am willing to recommend the service of this Long-Term Care Unit to a friend or family member.	6,40	0,736	0	0	0	0	14,6	31,3	54,2
P25. I am willing to return, if necessary, to the service of this Long-term Care Unit.	6,56	0,616	0	0	0	0	6,3	31,3	62,5
P26. The comments I make about the service provided in this Long-term Care Unit, when talking to others, are positive.	5,96	0,967	0	0	2,1	4,2	22,9	37,5	33,3
P27. I do not intend to stop receiving the healthcare services provided in this Long-term Care Unit, while I need them.	6,40	0,962	0	0	2,1	4,2	8,3	22,9	62,5
P28. This Long-term Care Unit is my first choice due to the service it offers.	6,33	0,808	0	0	2,1	0	8,3	41,7	47,9

(Source: prepared by the author)

Annex 4 – Descriptive Analysis of Health State Improvement

Table 34 - Frequencies for EQ-5D dimensions

Dimension	1st Moment		2nd Moment	
	AF	RF (%)	AF	RF (%)
Mobility				
I have no problems in walking about	2	4	11	23
I have some problems in walking about	43	90	36	75
I am confined to bed	3	6	1	2
Total	**48**	**100**	**48**	**100**
Self-Care				
I have no problems with self-care	12	25	24	50
I have some problems washing or dressing myself	17	35	21	44
I am unable to wash or dress myself	19	40	3	6
Total	**48**	**100**	**48**	**100**
Usual Activities				
I have no problems with performing my usual activities	8	17	18	38
I have some problems with performing my usual activities	30	63	26	54
I am unable to perform my usual activities	10	21	4	8
Total	**48**	**100**	**48**	**100**
Pain/Discomfort				
I have no pain or discomfort	16	33	37	77
I have some pain or discomfort	26	54	11	23
I have extreme pain or discomfort	6	13	0	0
Total	**48**	**100**	**48**	**100**
Anxiety/Depression				
I am not anxious or depressed	23	48	37	77
I am moderately anxious or depressed	19	40	11	23
I am extremely anxious or depressed	6	13	0	0
Total	**48**	**100**	**48**	**100**

(Source: prepared by the author)

Annex 5 – Assumptions for the use of Parametric Tests

Table 35 - Normality test for the independent variable "Gender" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Gender		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	Male	0,229	21	0,005	0,863	21	0,007
	Female	0,152	27	0,110	0,896	27	0,011
Reliability	Male	0,108	21	,200*	0,956	21	0,447
	Female	0,145	27	0,152	0,948	27	0,187
Responsiveness	Male	0,188	21	0,051	0,865	21	0,008
	Female	0,247	27	0,000	0,810	27	0,000
Assurance	Male	0,254	21	0,001	0,811	21	0,001
	Female	0,220	27	0,002	0,752	27	0,000
Empathy	Male	0,112	21	,200*	0,931	21	0,145
	Female	0,138	27	0,200	0,920	27	0,040
Global Quality	Male	0,265	21	0,000	0,803	21	0,001
	Female	0,352	27	0,000	0,750	27	0,000
Satisfaction	Male	0,258	21	0,001	0,837	21	0,003
	Female	0,137	27	,200*	0,921	27	0,041
Health State Improvement	Male	0,181	21	0,070	0,911	21	0,058
	Female	0,092	27	,200*	0,958	27	0,336
Self-evaluated Health Status Improvement	Male	0,158	21	0,184	0,901	21	0,036
	Female	0,163	27	0,065	0,942	27	0,138

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 36 - Normality test for the independent variable "Age" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Age		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	64 years old or less	0,190	11	,200*	0,908	11	0,232
	65 years old or more	0,173	37	0,007	0,869	37	0,000
Reliability	64 years old or less	0,185	11	,200*	0,953	11	0,685
	65 years old or more	0,134	37	0,094	0,953	37	0,125
Responsiveness	64 years old or less	0,163	11	,200*	0,929	11	0,397
	65 years old or more	0,233	37	0,000	0,834	37	0,000
Assurance	64 years old or less	0,183	11	,200*	0,932	11	0,428
	65 years old or more	0,272	37	0,000	0,728	37	0,000
Empathy	64 years old or less	0,153	11	,200*	0,931	11	0,425
	65 years old or more	0,125	37	0,155	0,922	37	0,013
Global Quality	64 years old or less	0,280	11	0,016	0,826	11	0,021
	65 years old or more	0,327	37	0,000	0,756	37	0,000
Satisfaction	64 years old or less	0,216	11	0,159	0,896	11	0,167
	65 years old or more	0,171	37	0,008	0,859	37	0,000
Health State Improvement	64 years old or less	0,261	11	0,035	0,895	11	0,159
	65 years old or more	0,107	37	,200*	0,946	37	0,070
Self-evaluated Health Status Improvement	64 years old or less	0,227	11	0,117	0,888	11	0,130
	65 years old or more	0,183	37	0,003	0,865	37	0,000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 37 - Normality test for the independent variable "Residence" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Residence		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	Lisboa and Vale do Tejo	0,192	37	0,001	0,873	37	0,001
	Outside Lisboa and Vale do Tejo	0,141	11	,200*	0,949	11	0,625
Reliability	Lisboa and Vale do Tejo	0,142	37	0,057	0,946	37	0,070
	Outside Lisboa and Vale do Tejo	0,273	11	0,021	0,914	11	0,271
Responsiveness	Lisboa and Vale do Tejo	0,193	37	0,001	0,854	37	0,000
	Outside Lisboa and Vale do Tejo	0,154	11	,200*	0,950	11	0,647
Assurance	Lisboa and Vale do Tejo	0,295	37	0,000	0,732	37	0,000
	Outside Lisboa and Vale do Tejo	0,147	11	,200*	0,945	11	0,579
Empathy	Lisboa and Vale do Tejo	0,146	37	0,046	0,915	37	0,008
	Outside Lisboa and Vale do Tejo	0,136	11	,200*	0,956	11	0,724
Global Quality	Lisboa and Vale do Tejo	0,282	37	0,000	0,760	37	0,000
	Outside Lisboa and Vale do Tejo	0,482	11	0,000	0,504	11	0,000
Satisfaction	Lisboa and Vale do Tejo	0,188	37	0,002	0,829	37	0,000
	Outside Lisboa and Vale do Tejo	0,212	11	0,181	0,857	11	0,052
Health State Improvement	Lisboa and Vale do Tejo	0,105	37	,200*	0,955	37	0,138
	Outside Lisboa and Vale do Tejo	0,173	11	,200*	0,924	11	0,350
Self-evaluated Health Status Improvement	Lisboa and Vale do Tejo	0,169	37	0,009	0,949	37	0,089
	Outside Lisboa and Vale do Tejo	0,314	11	0,003	0,809	11	0,012

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 38 - Normality test for the independent variable "Education Level" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Education Level		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	4th year of schooling or less	0,209	16	0,059	0,832	16	0,007
	Between 6th and 12th year of schooling	0,196	13	0,185	0,870	13	0,052
	Bachelor's degree or higher	0,173	19	0,136	0,902	19	0,053
Reliability	4th year of schooling or less	0,211	16	0,054	0,928	16	0,226
	Between 6th and 12th year of schooling	0,219	13	0,088	0,883	13	0,078
	Bachelor's degree or higher	0,136	19	,200*	0,962	19	0,612
Responsiveness	4th year of schooling or less	0,272	16	0,002	0,697	16	0,000
	Between 6th and 12th year of schooling	0,205	13	0,139	0,869	13	0,051
	Bachelor's degree or higher	0,207	19	0,031	0,878	19	0,020
Assurance	4th year of schooling or less	0,292	16	0,001	0,728	16	0,000
	Between 6th and 12th year of schooling	0,212	13	0,112	0,849	13	0,028
	Bachelor's degree or higher	0,330	19	0,000	0,783	19	0,001
Empathy	4th year of schooling or less	0,197	16	0,099	0,878	16	0,036
	Between 6th and 12th year of schooling	0,125	13	,200*	0,971	13	0,903
	Bachelor's degree or higher	0,202	19	0,040	0,893	19	0,037
Global Quality	4th year of schooling or less	0,314	16	0,000	0,686	16	0,000
	Between 6th and 12th year of schooling	0,317	13	0,001	0,795	13	0,006
	Bachelor's degree or higher	0,390	19	0,000	0,688	19	0,000
Satisfaction	4th year of schooling or less	0,288	16	0,001	0,821	16	0,005
	Between 6th and 12th year of schooling	0,227	13	0,066	0,840	13	0,021
	Bachelor's degree or higher	0,222	19	0,014	0,873	19	0,016
Health State Improvement	4th year of schooling or less	0,141	16	,200*	0,976	16	0,926
	Between 6th and 12th year of schooling	0,195	13	0,191	0,947	13	0,547
	Bachelor's degree or higher	0,205	19	0,035	0,843	19	0,005

Self-evaluated Health Status Improvement	4th year of schooling or less	0,215	16	0,047	0,921	16	0,173
	Between 6th and 12th year of schooling	0,140	13	,200*	0,935	13	0,399
	Bachelor's degree or higher	0,181	19	0,103	0,889	19	0,030

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 39 - Normality test for the independent variable "Living Arrangement" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Living Arrangement		**Kolmogorov-Smirnov[a]**			**Shapiro-Wilk**		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	With someone	0,166	23	0,101	0,885	23	0,012
	Alone	0,180	25	0,036	0,885	25	0,009
Reliability	With someone	0,151	23	0,188	0,951	23	0,310
	Alone	0,112	25	,200*	0,970	25	0,639
Responsiveness	With someone	0,216	23	0,007	0,848	23	0,002
	Alone	0,144	25	0,191	0,915	25	0,039
Assurance	With someone	0,189	23	0,032	0,834	23	0,001
	Alone	0,266	25	0,000	0,711	25	0,000
Empathy	With someone	0,112	23	,200*	0,952	23	0,317
	Alone	0,140	25	,200*	0,916	25	0,042
Global Quality	With someone	0,302	23	0,000	0,828	23	0,001
	Alone	0,329	25	0,000	0,685	25	0,000
Satisfaction	With someone	0,127	23	,200*	0,936	23	0,145
	Alone	0,186	25	0,026	0,830	25	0,001
Health State Improvement	With someone	0,142	23	,200*	0,910	23	0,041
	Alone	0,094	25	,200*	0,956	25	0,338
Self-evaluated Health Status Improvement	With someone	0,124	23	,200*	0,955	23	0,378
	Alone	0,233	25	0,001	0,802	25	0,000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 40 - Normality test for the independent variable "Network" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Network		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	Public	0,195	25	0,015	0,860	25	0,003
	Private	0,119	23	,200*	0,927	23	0,096
Reliability	Public	0,134	25	,200*	0,952	25	0,272
	Private	0,169	23	0,087	0,963	23	0,526
Responsiveness	Public	0,179	25	0,039	0,841	25	0,001
	Private	0,169	23	0,089	0,935	23	0,138
Assurance	Public	0,253	25	0,000	0,755	25	0,000
	Private	0,247	23	0,001	0,845	23	0,002
Empathy	Public	0,140	25	,200*	0,924	25	0,065
	Private	0,132	23	,200*	0,948	23	0,271
Global Quality	Public	0,278	25	0,000	0,761	25	0,000
	Private	0,370	23	0,000	0,737	23	0,000
Satisfaction	Public	0,220	25	0,003	0,807	25	0,000
	Private	0,136	23	,200*	0,907	23	0,036
Health State Improvement	Public	0,115	25	,200*	0,956	25	0,334
	Private	0,143	23	,200*	0,926	23	0,088
Self-evaluated Health Status Improvement	Public	0,213	25	0,005	0,926	25	0,069
	Private	0,174	23	0,067	0,897	23	0,022

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 41 - Normality test for the independent variable "Previous Institutionalization" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Previous Institutionalization		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	Yes	0,155	22	0,180	0,910	22	0,047
	No	0,186	26	0,021	0,874	26	0,004
Reliability	Yes	0,179	22	0,065	0,944	22	0,238
	No	0,146	26	0,165	0,952	26	0,256
Responsiveness	Yes	0,124	22	,200*	0,941	22	0,209
	No	0,227	26	0,001	0,839	26	0,001
Assurance	Yes	0,294	22	0,000	0,727	22	0,000
	No	0,202	26	0,008	0,814	26	0,000
Empathy	Yes	0,108	22	,200*	0,925	22	0,097
	No	0,154	26	0,115	0,947	26	0,194
Global Quality	Yes	0,372	22	0,000	0,688	22	0,000
	No	0,269	26	0,000	0,832	26	0,001
Satisfaction	Yes	0,185	22	0,048	0,837	22	0,002
	No	0,165	26	0,068	0,904	26	0,019
Health State Improvement	Yes	0,135	22	,200*	0,914	22	0,058
	No	0,095	26	,200*	0,966	26	0,517
Self-evaluated Health Status Improvement	Yes	0,213	22	0,010	0,836	22	0,002
	No	0,157	26	0,099	0,947	26	0,198

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Table 42 - Normality test for the independent variable "Duration of Institutionalization" for the five quality dimensions, global quality, satisfaction, and health state and self-evaluated status improvement

Duration of Institutionalization		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Tangibility	Less than 1 week (inclusive)	0,196	14	0,149	0,890	14	0,082
	Between 1 and 2 weeks (inclusive)	0,186	20	0,069	0,858	20	0,007
	More than 2 weeks	0,196	14	0,149	0,884	14	0,067
Reliability	Less than 1 week (inclusive)	0,128	14	,200*	0,954	14	0,626
	Between 1 and 2 weeks (inclusive)	0,145	20	,200*	0,967	20	0,694

	More than 2 weeks	0,167	14	,200*	0,933	14	0,334
Responsiveness	Less than 1 week (inclusive)	0,280	14	0,004	0,824	14	0,010
	Between 1 and 2 weeks (inclusive)	0,199	20	0,038	0,926	20	0,130
	More than 2 weeks	0,159	14	,200*	0,909	14	0,150
Assurance	Less than 1 week (inclusive)	0,253	14	0,016	0,805	14	0,006
	Between 1 and 2 weeks (inclusive)	0,201	20	0,033	0,821	20	0,002
	More than 2 weeks	0,233	14	0,037	0,828	14	0,011
Empathy	Less than 1 week (inclusive)	0,200	14	0,135	0,886	14	0,071
	Between 1 and 2 weeks (inclusive)	0,104	20	,200*	0,960	20	0,544
	More than 2 weeks	0,117	14	,200*	0,943	14	0,465
Global Quality	Less than 1 week (inclusive)	0,330	14	0,000	0,788	14	0,004
	Between 1 and 2 weeks (inclusive)	0,351	20	0,000	0,754	20	0,000
	More than 2 weeks	0,263	14	0,009	0,806	14	0,006
Satisfaction	Less than 1 week (inclusive)	0,187	14	,200*	0,859	14	0,030
	Between 1 and 2 weeks (inclusive)	0,135	20	,200*	0,928	20	0,144
	More than 2 weeks	0,207	14	0,107	0,882	14	0,061
Health State Improvement	Less than 1 week (inclusive)	0,140	14	,200*	0,967	14	0,828
	Between 1 and 2 weeks (inclusive)	0,128	20	,200*	0,975	20	0,858
	More than 2 weeks	0,159	14	,200*	0,850	14	0,023
Self-evaluated Health Status Improvement	Less than 1 week (inclusive)	0,264	14	0,009	0,907	14	0,145
	Between 1 and 2 weeks (inclusive)	0,179	20	0,091	0,891	20	0,028
	More than 2 weeks	0,204	14	0,120	0,866	14	0,037

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Annex 6 – Cronbach's Alpha Coefficient for Satisfaction

Table 43 – Cronbach's Alpha Coefficient if item deleted

	Corrected Item-Total Correlation	**Cronbach's Alpha if Item Deleted**
P24. I am willing to recommend the service of this Long-Term Care Unit to a friend or family member.	0,685	**0,793**
P25. I am willing to return, if necessary, to the service of this Long-term Care Unit.	0,627	**0,813**
P26. The comments I make about the service provided in this Long-term Care Unit, when talking to others, are positive.	0,600	**0,819**
P27. I do not intend to stop receiving the healthcare services provided in this Long-term Care Unit, while I need them.	0,623	**0,811**
P28. This Long-term Care Unit is my first choice due to the service it offers.	0,723	**0,779**

(Source: prepared by the author)

Annex 7 – Assumptions for the use of Correlations

Table 44 - Normality Test for the variables global quality and satisfaction

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Global Quality	0,316	48	0,000	0,774	48	0,000
Satisfaction	0,149	48	0,010	0,888	48	0,000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

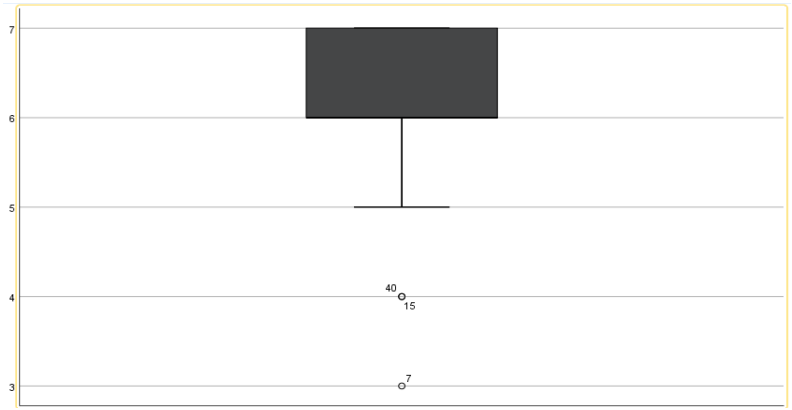

Figure 5 - Box Plot for Global Quality
(Source: SPSS Software)

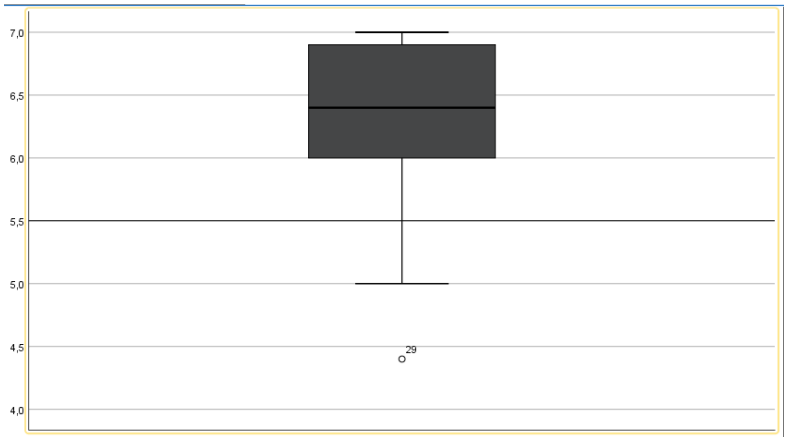

Figure 6 - Box Plot for Satisfaction
(Source: SPSS Software)

Table 45 - Normality Test for the variables health state improvement and self-evaluated health status improvement

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Health State Improvement	0,104	48	0,200	0,958	48	0,087
Self-evaluated Health Status Improvement	0,153	48	0,006	0,893	48	0,000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

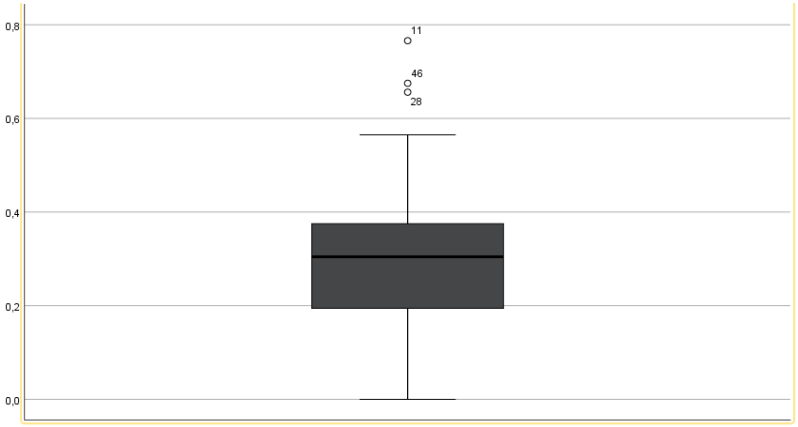

Figure 8 - Box Plot for Health State Improvement

(Source: SPSS Software)

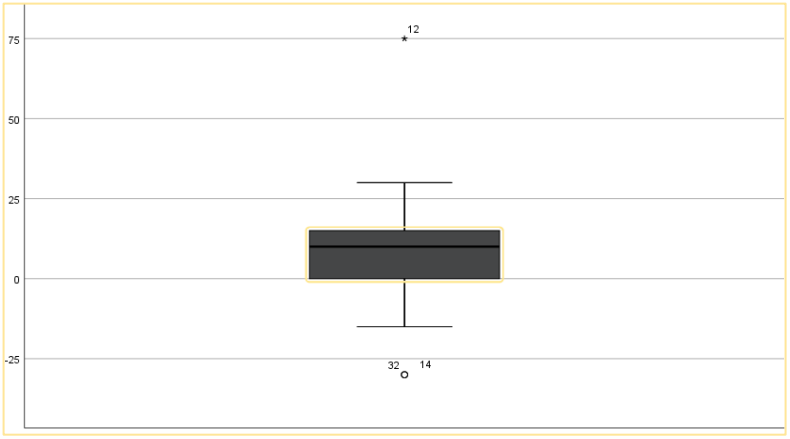

Figure 7 - Box Plot for Self-evaluated Health Status Improvement

(Source: SPSS Software)

Table 46 - Normality Test for the variables Global Quality and Health State Improvement

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Health State Improvement	0,104	48	0,200	0,958	48	0,087
Self-evaluated Health Status Improvement	0,153	48	0,006	0,893	48	0,000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

(Source: prepared by the author)

Annex 8 – Mean and Median for the Independent Variables "Residence", "Living Arrangement" and "Age"

Table 47 – Mean, Median and SD for the independent variable "Residence" by group for Global Quality and Satisfaction

	Residence	Mean	Median	SD
Global Quality	Lisboa and Vale do Tejo	6,19	6,00	0,908
	Outside Lisboa and Vale do tejo	5,73	6,00	0,647
Satisfaction	Lisboa and Vale do Tejo	6,44	6,60	6,36
	Outside Lisboa and Vale do tejo	5,96	6,20	0,55

For a 95% Confidence Interval

(Source: prepared by the author)

Table 48 - Mean, Median and SD for the independent variable "Living Arrangement" by group for Satisfaction

	Living Arragement	Mean	Median	SD
Satisfaction	With someone	6,13	6,20	0,795
	Alone	6,51	6,60	0,533

For a 95% Confidence Interval

(Source: prepared by the author)

Table 49 - Mean, Median and SD for the independent variable "Age" by group for Empathy

	Age	Mean	Median	SD
Empathy	64 years old or less	5,44	5,40	0,857
	65 years old or more	5,90	5,80	0,793

For a 90% Confidence Interval

(Source: prepared by the author)

Table 50 - Mean, Median and SD for the independent variable "Age" by group for Tangibility

	Residence	Mean	Median	SD
Tangibility	Lisboa and Vale do Tejo	6,32	6,50	0,696
	Lisboa and Vale do Tejo	5,70	5,50	0,934

For a 94% Confidence Interval

(Source: prepared by the author)