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## **How Service Design Can Improve the Patient Experience**

### **Abstract**

Significant changes are taking place in healthcare organisations, where the pressure is increasing to develop personalised services that meet patients' needs while integrating the necessary resources. This research joins a stream of research that suggests that healthcare can be more patient-centered, where the role of the patient is redefined from passive recipient to more active and collaborative participant. Through the feedback of patients and health providers, the service design should improve service quality. It is essential first to identify the challenges in the service that need to be improved. The present study was developed according to answers given by patients and health providers from Portuguese cardiology units. Data were collected using two questionnaires. The main findings explicitly contribute to improve the patient experience, so it gives a clear direction on how to improve the service.

**Keywords:** healthcare, healthcare organizations, patient centricity, patient experience, patient satisfaction, Service design

**JEL Classification:** I12-Health Behavior, M1- Business Administration

# 1 Introduction

## 1.1 Background and motivations

Over the past two decades, a major paradigm shift has emphasised the importance of customer- and user-centered thinking in both business and design fields.

Today healthcare organisations are under growing pressure to better offer customised services that respond to patient needs while integrating their resources (Liff, R., Andersson, T, 2011). Healthcare systems and organisations are looking to improve the health system's performance due to the challenges in patient decision-making power. The role of patients is changing. People are looking for a service that can address their expectations.

Nowadays' problems are related to the role of patients in the current healthcare system. This system is illness and disease-based, promoting procedures that the patients do not choose. The quality of care is not only measured by the time of treatments or by the exams that are made but are addressed with two broad categories as patient experience and patient satisfaction. Berry et al. (2006) mentioned customer satisfaction as the pleasurable emotional state of customers' feelings as the consequence of their experience. The patients want now a more patient-centric approach. We need to measure the quality of healthcare by the eyes of the patient.

Research problem: The effects of service design on the Portuguese cardiology unit, measured by patients' experience, are not well understood. There is a need to a deep understanding of patients' needs, challenges, goals, wishes, and experiences.

It has been increasingly emphasised that the key to success and the creation of real value does not depend so much on the resources and skills of organisations to produce products and services, but instead based on a deep understanding of needs, challenges, goals, wishes and experiences of customers. Thus, a close collaboration between organisations and customers is essential (Prahalad and Ramaswamy 2004; Bettencourt 2010; Fitzsimmons and Fitzsimmons 2000; Ojasalo and Ojasalo 2015; Koskinen et al. 2011).

A lack of issues could be investigated, mainly how a service design can improve patient experience promoting the shift from a passive patient to an active person during the entire treatment.

## 1.2 Structure of the research

This first chapter presents the background, objectives and approach of the research. The second chapter analyses the theoretical context and the main related concepts. The second chapter also highlights some key learnings identified and points of consideration based on the review. The third chapter will focus on the actual development project, first describing and discussing the background and service design process model used, then the different phases of the actual research project and the methods used. The fourth chapter describes the results of the project. Moreover, the fifth and final chapter summarises the entire research, discussing and reflecting on the project and the lessons learned.

## **2 Key concepts and theoretical context**

### **2.1 Patient Centricity**

Patient-centered care has been an evolving concept, originally mentioned as "understanding the patient as a unique human being" By Edith Balint in 1969. There are many concepts to describe patient-centricity over the years.

According to Dennis (2018) Person-centricity requires that each person be vested with the responsibility for his or her health. This does not mean letting the patient alone, but allowing him or her to be in synergy among the community, health professionals, and government. The patients need to have an infrastructure that allows them to invest more and control their health.

Larson (2018) records that the person-centricity approach encourages the person to become more expert on him/herself in assessing the impact of any treatment or option. This approach is enhanced if the appropriate support infrastructure exists.

Following a study by Santana (2017), patient-centric care (PCC) is not limited to only the patient but includes families and caregivers who are involved, those who are not living with illness, and prevention and promotion activities.

The World Health Organization (WHO) has developed policy care frameworks for people-centered health, highlighting person-centeredness as a core competency of health workers and as an essential quality component of healthcare and primary care.

Transforming care to being more patient-centered is a complex task for healthcare organisations, because it is a subjective concept. There is a lack of clarity and precision in designing the measures needed. This concept of PC (Patient centricity) requires a standardised

framework that helps to implement and apply it quickly. Healthcare systems must find a way to implement and measure PCC effectively.

The goal of the person centricity approach is to replace the disease-focused approach with a more focused approach, giving the patient the key role for their own health outcomes. To make this approach applicable, we need to give the authority, autonomy, and responsibility to the patient and give him/her the education needed to make the right choices. Allowing patients to access this area of knowledge challenges the identity of healthcare professionals (Andersson, 2015). The legitimacy of the medical profession in society is based on trust in professionals. That is, the best interests of patients are always put first (Wilensky, 1964). However, researchers also believe that professionals can actively defend their fields and positions by ensuring that they are dominant in the field of knowledge, thereby preventing other actors from challenging their own decisions (Abbott, 1988; Freidson, 2001).

According to Freidson (2001) and Wilensky(1964), there are two competing characteristics in the healthcare professional logic: the service ideal and professional dominance. The service ideal implies that an expert, acting benevolently, consistently works to the most significant advantage of the customer. Professional dominance is the egocentric conviction that an expert realises best for a customer (Liff and Andersson, 2011). These competing characteristics clarify why joint improvement efforts, including patients and medical care experts, are a natural evolution based on the altruistic service ideal in expert rationale, yet additionally challenge the very centre of professional logic thinking about egocentric expert predominance.

New approaches are needed for both patients and healthcare professionals. Luxford, Gelb Safran, and Delblanco (2011, p. 513) argued that an obstacle to shifting from "provider-focused" to "patient-centric" is changing the "employee's mentality." Employees may also think that involving patients in improvement is time-consuming and will compete with daily tasks (Donetto, Tsinakas, and Robert, 2014; Larkin, Boden, and Newton, 2015).

In order to improve healthcare, a method was developed. This method which will involve patients in healthcare improvement, is designated experience-based co-design (EBCD), in which not only healthcare professionals but patients use their own experiences as a key starting point for development efforts to improve care. (Bate & Robert, 2006).

Successful collaborative improvement in healthcare requires courage to change the current roles of patients and healthcare professionals. Managers are usually willing to involve patients in improvement plans, but there are a lack of knowledge and experience on how to

improve (Andersson & Olheden, 2012; Bate & Robert, 2006; Iedema, etc., 2010). In the pursuit of higher medical quality, it is crucial to use the unique experience of patients, but the challenges must be clarified. In EBCD, medical staff and patients work together in four steps: capturing experience, understanding experience, improving and following up (Bate & Robert, 2006; Tsianakas et al., 2012). In these stages, storytelling is the basic foundation for improvement, and there are opportunities for dialogue to support learning among individuals, groups, and organisations.

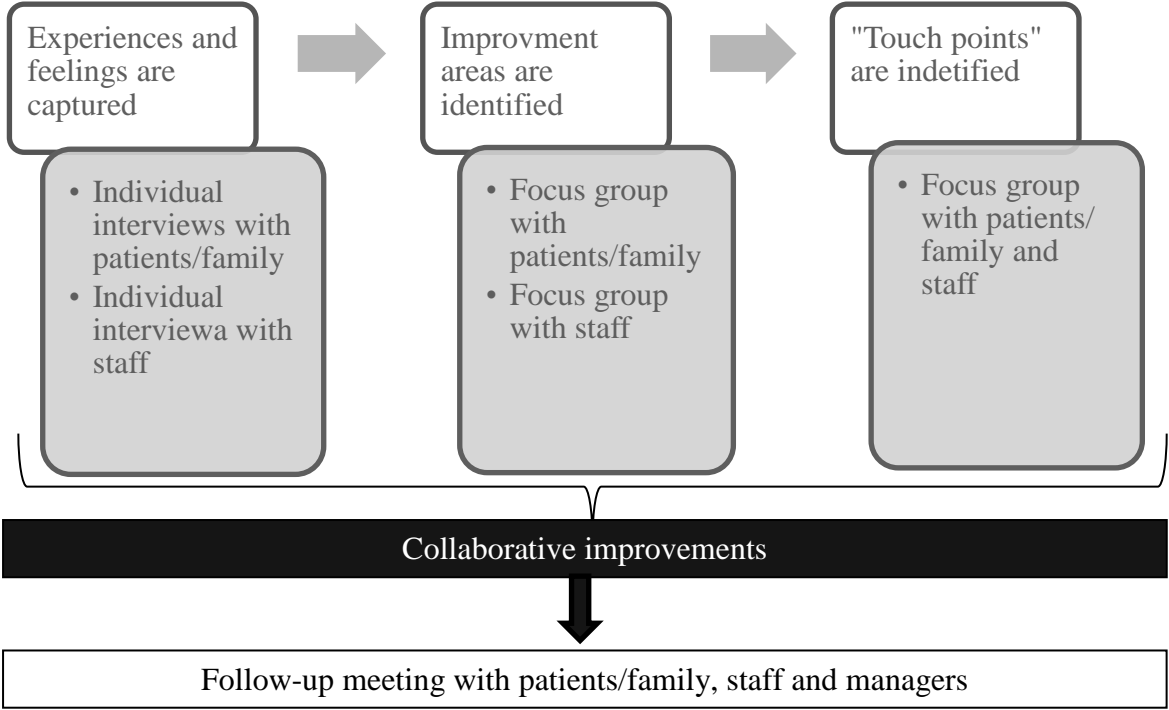


Figure 1. Stages of the action research process that together make up the EBCD approach to improving patient experiences (based on Bate & Robert, 2006, 2007; Tsianakas et al., 2012)

The EBCD and AR is promising method that can be used to address the challenge of patient involvement in improving healthcare.

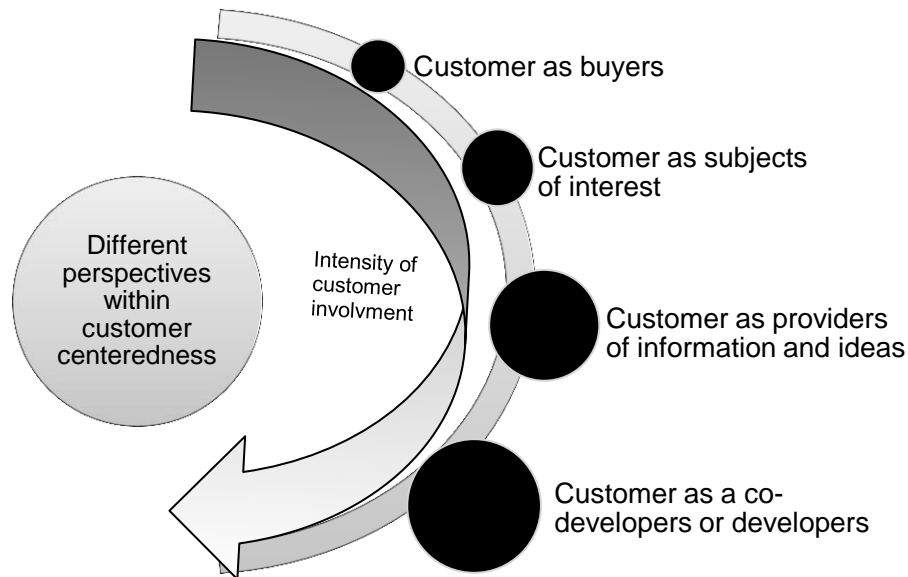


Figure 2. Different perspectives within customer centeredness (cretaed based on Edvarsson et al. 2010)

During the development process, the relationship between the customer's role and the participation phase may also be different; whether the customer only participates at the beginning or only the later steps (such as verifying or testing new service concept permissions before launch), or whether the customer is closely involved The various steps of the process. According to the research review, Edvarsson et al. (2010, 568-574) list a model in which if the customer role is purely regarded as a buyer, an object of interest, an information provider, or as a joint developer or developer, and then it is regarded as a role (Figure 2-different points of view). On the other hand, customers may be seen as mere objects of inaction, while on the other hand, they are seen as essential resources with vital knowledge and know-how that constitute an important part of the design or development process.

User-centricity can range from collecting insights and understanding of users, their needs and desires, to collecting user feedback during the development process (for example, by testing and verifying services or service concepts, so that users can act as active cooperation Partners are involved in the actual conception, design and development process. (Keinonen 2010, Koskinen et al. 2011.)

The design should first be based on understanding the target users, their goals, tasks, and environment. Secondly, the design needs to be iteratively developed with user participation, and the design solution needs to be evaluated by the user or based on user-specific factors in the process. (Roto, Law, Vermeeren, Hoonhout 2011, 6-7.)

User-centric thinking and design development are also closely linked, such as the development of participatory design and co-design movement. These methods have their own historical and theoretical basis, as well as practical focus. Compared with the traditional user-centered way of thinking, participatory and code signing methods emphasise deeper collaboration and participation with users in the design and development process (see Sanders & Stappers, 2008; Von hippel 2005). However, the boundaries of different concepts are flexible and overlapping, and user centrality can be used as a general term that encompasses different perspectives and models.

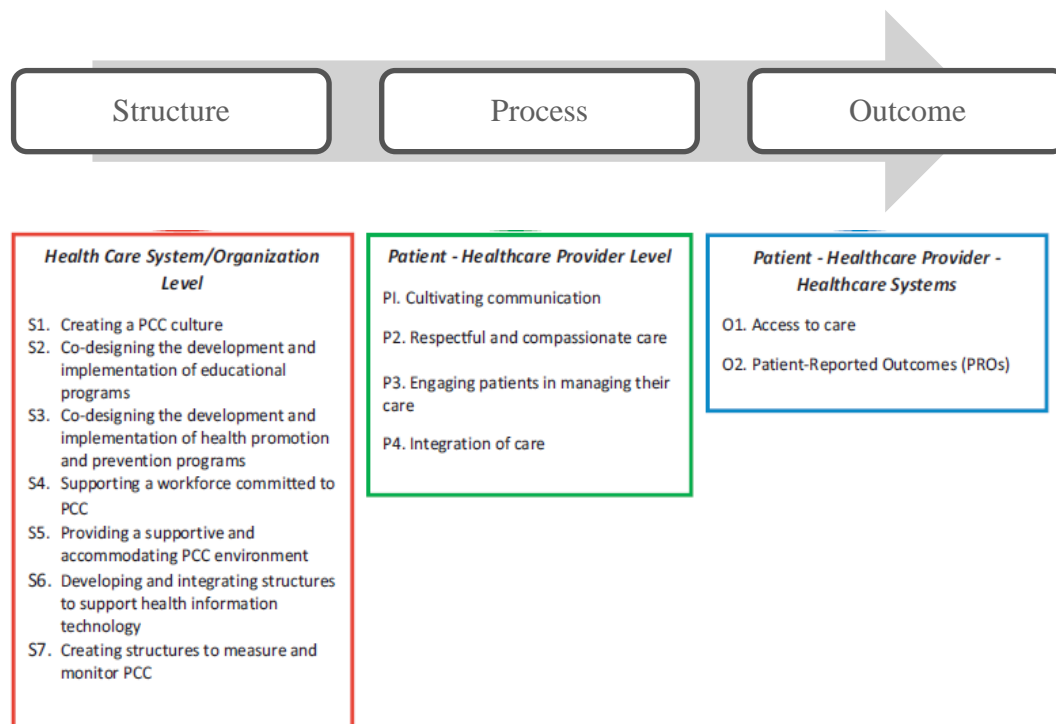


Figure 3. Patient Centric Model by Santana MJ, 2017

According to Santana (Santana MJ, 2017), there are three steps to achieve the Patient-centric model (PCC). The structure phase, the process phase and the outcome phase. The structure level (healthcare system/organisational level) has been identified seven pre-requisites to promote the patient-centric model. In figure 3, the seven core structural domains that have been identified as pre-requisites are mentioned. The First mentioned (S1) recognise the importance of creating a PCC culture across the continuum of care, where governments



and organisations play a key role in developing clear policies, processes and structures for healthcare systems and healthcare providers to deliver PCC.

The literature widely recognises the importance of co-design the development and implementation of educational programs (S2).

The current education focuses on the biomedical model, which is not standardised across healthcare systems and professionals and is not co-developed between patients and healthcare providers. There are already some successful models related to development and implementation of training, but with the rapid emerge and evolution of PCC, there is a need related with innovation of the education programs that are endorsed by key stakeholders and champions in medical education. Medical faculty, deans, administrative director and accrediting bodies have an important role to create these new innovative models.

Through the collaboration with patients and by empowering patients, patient advisory groups, patients and communities can also play a key role in co-designing the development and implementation of health promotion and prevention programs (S3).

Another major structural component is to provide a supportive PCC work environment to ensure that employees have sufficient resources to practice PCC (S4).

A supportive and accommodating built environment is an essential aspect of PCC (S5), where co-design with patients is crucial to ensure that patients feel comfortable, welcomed, and met.

It is also necessary to develop a universal electronic medical platform to exchange health information between providers and patients and have the ability to link all electronic medical data throughout the nursing process (S6).

Finally, patients, health care providers, and policymakers should jointly develop structures to measure and monitor PCC performance based on patient feedback to promote PCC practice (S7).

The key guiding principle for PCC implementation is to incorporate the patient's perspective, so it is necessary to ensure that care is also patient-oriented to provide patients with sufficient and appropriate information to make decisions about their care and participation. In addition, PCC respects the personal beliefs and values of patients and promotes dignity and anti-discrimination care.

Must identify and ensure that diversity is addressed and incorporated, including race, gender, gender identity, religion, age, socioeconomic status and disability. PCC's "rights claim" consistently promotes patients and medical service providers' dignity and makes both parties aware of their rights and responsibilities.

PCC promotes the value of co-design, in which health care providers do things with people rather than "to" or "for" them. Lack of attention to PCC in medical education is still an obstacle to its implementation.

Outcomes:

PCC (O1a.) is generally considered to be timely access to care, which is the time to wait for surgery and referral and the time required for consultation or waiting for test results and the availability of medical care. The provider is within and outside working hours (O1b.). Improving the potential for timely access to care may reduce the number of hospitalisations, reduce the utilisation of health care services (such as emergency room visits and length of stay), and help reduce the incidence and mortality of acute and chronic diseases.

The impact of PCC on the outcome can be informed by the use of patient-reported results (PRO). PRO is a patient-centred measure that includes information about the health condition and management from the patient to establish a connection (O2) between medical service provision and results. For example, Stewart et al. emphasised that once patients believe that a visit is people-oriented, they will have better recovery and emotional health, and fewer diagnostic tests and referrals will be made after two months. Silva describes how to reduce the likelihood of people using emergency hospital services when they manage their care more effectively and when they are supported.

Bertakis et al. (2011) reported that patients who received a higher average PCC practice mode during clinic visits were less likely to use specialist clinics. Specific PROs that can be implemented include patient-reported outcome measures (PROM; O2a.), which are used to measure the patient's health, quality of life and symptoms, function, physical, mental or social health. Patient-reported experience measures (PREM; O2b.) Use the health care system to measure the patient's experience and the adverse results reported by the patient (PRAOS; O2c.). It has been proven that integrating these measures into clinical practice can improve treatment outcomes and improve the quality of care.

In addition, "prevention is an investment to be leveraged rather than a cost to be justified." In order to promote and optimise person-centered impact, we need to go beyond individuals and target the entire community to improve health, not just insured life or a "patient" of a member or caregiver group. At the community, system, and national level, we must be faithful to our mission spirit.

## **2.2 Service design for customer and user centered development**

People-centeredness emerges as a characteristic of service design (SD) (Holmlid 2009; Meroni and Sangiorgi 2011; Stickdorn 2010), since it is a process that evolves people and providers, and they result from complex interactions inside and outside the service organisation (Polaine et al. 2013).

Before going deeper into the service design concept, we need to split it into two terms: service and design.

Services include specific combinations of tangible and intangible elements (Bitner, 1990), and these elements can be properly arranged to provide consumers with a value proposition (Vargo & Lusch, 2016).

Generally, to make services effective, simple, standardised elements and processes must be adopted to reduce differences in service delivery and improve service quality (Flynn, Schroeder and Sakakibara, 1995). Services often fail because they are not based on consumers' needs and wants (Brown & Wyatt, 2015; Lee & Chen (Lee & Chen), 2009).

According to Bitner, Ostrom, Morgan and Brown (2008), design is a complex term about more than a product or service and user experiences, processes, and systems. Design is directly related to problem setting and problem-solving (Meroni, 2008).

Kolko (2010) also defined design as a process that exists to a greater end. This means that design is vital to enhance the human experience, solving complicated problems. The service system holistically people, processes, tangibles, and technology must be considered in the design process (Patricio, Fisk, Cunha, & Constantine, 2011).

SD involves the intentional configuration of fundamental physical and nonphysical elements in a service system (Goldstein, Johnston, Duffy, & Rao, 2002).

The term "service design" was initially proposed by Shotstack (1982, 1984) when she introduced the concept of service blueprints. She explained: "Leaving the service to individual talents rather than the overall management will make the company more vulnerable and create services that respond slowly to market needs and opportunities" (1984, p. 139). A successfully designed service will be user-friendly and relevant to the consumer entity while also providing the service entity with a sustainable competitive advantage. Sustainable competitive advantage benefits consumers and service providers, because depending on the provider (for example, private or public), unsustainable and uncompetitive service offerings may stop or continue, although it will harm Vulnerable users (Rayburn, 2015).

In order to achieve sustained excellence, the service literature believes that service delivery and quality perception depend on appropriately designed services that can meet or exceed customer expectations (for example, Teixeira et al., 2017). Successful interaction among employees, collectives, processes, and organisation is crucial to realising well-being outcomes.

Shaw et al. (2018) mentioned that SD is not simply improving existing processes and workflows but reinventing the service process to achieve a greater or a different impact. It is "a powerful transformative force that is capable of changing institutions" (Kurtmollaiev et al., 2018, p. 12).

According to Mager (2009), SD is the activity of planning and organising people, infrastructure, communication and material components of a service. These are directly related to the quality and service provider and costumers improvement. SD puts the customer first and the organisation second. (Andreassen et al., 2015).

Polaine et al (2013) mentioned SD as the design with people rather than just for them. "People" refers to not only customers or end users but also the service providers.

The SD approach helps organisations to achieve service innovation through the creation and redesign of the services that are closer to patient needs. This means to increase its desirability and usability and efficiency and effectiveness of organisations, in this specific case, healthcare organisations (Polaine et al. 2013).In consequence, it will increase focus on patient and provider needs. The proper design also incorporates consumer and provider expressed needs and the inherent behaviours of all design users (Binder et al., 2008; Meroni, 2008).

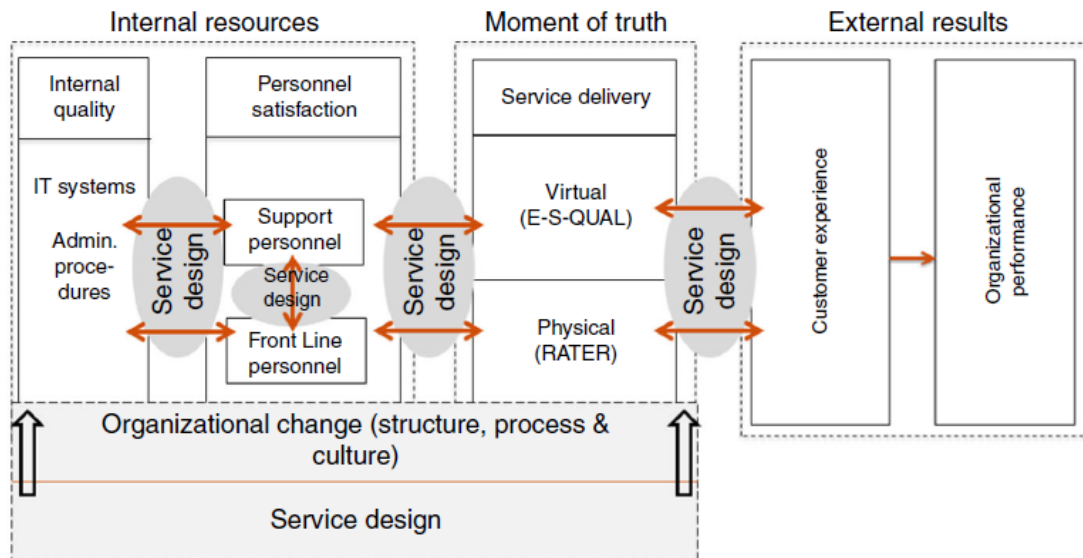
As Shaw et al. 1 (2018) mentioned in their study, service design can be defined through four principles. These four principles suggest that service design:

1. Aims to create services that are useful, useable, desirable, efficient, and effective.
2. Is a human-centered approach that focuses on customer experience and the quality-of-service encounter as the critical value for success?
3. Is a holistic approach that considers in an integrated way strategic, system, process, and touchpoint design decisions (i.e., decisions about how users interact with services)?
4. Is a systematic and iterative process that integrates user-oriented, team-based interdisciplinary approaches and methods in ever-learning cycles?

According to Andreasson (2015), SD might facilitate organisational change and improve value creation at different internal and external touchpoints.

SD thinking is an approach firms can use to systematically meet both the "organisation's need to be competitive and the customer's rising expectations choice and quality" (Interaction Design Foundation, 2017).

An important aspect that we have to consider is that healthcare organisations need to have the culture and structures that enable the use of SD. The problem needs to be understood, the motivation of all stakeholders, and the support methods involving users.



(Malmberg,2017)

Figure 4. Service design for organizational change and enhanced value creation (Andreassen et al, 2015)

Healthcare consumers are seen as active recipients of care, co-creators of their experiences (Danaher & Gallan, 2016). They have both roles, shaping the customer experience and co-creating value (McCull-Kennedy et al., 2012)

Healthcare consumers have particularities because these consumers may be vulnerable due to the diseases. They often get sick and sometimes cannot control their bodies.

In healthcare, access and uptake are imperative because they can mean the difference between life and death. Almost always mean the difference in the quality of patients' life. (Davis, Mohan and Rayburn, 2017).

In service, a key research priority is improving well-being and enhancing consumers' experiences, especially when consumers are vulnerable. (Ostrom et al., 2015). Healthcare services represent a journey that can be disjointed, confusing and scary for consumers over time. (Danaher & Gallan, 2016). To make this journey a better experience, some factors need to be addressed. Saffer (2007) has emphasised the importance of some important issues in the

patient experience, such as interior decoration, lighting, sounds, and smells. Ulrich (1992) referred to the poor design and factors such as lack of privacy and noise as determinant factors to higher anxiety, stress and higher levels of blood pressure.

Two groups of people interact in the provision of healthcare: caregivers (i.e. doctors, nurses and support staff) and consumers (i.e. patients and their families). With this reality in mind, we recognise that the well-being of both groups must be considered when designing healthcare services. Therefore, physical and mental health is related to employees, patients and families.

Morgan & Rao (2006) believed that consumers often do not know how to engage in the service due to the complexity of the Healthcare service. Often they need to be guided by service providers.

According to the service context, consumer participation varies due to the highly complexity, risky and anxiety. (Gallan, Jarvis, Brown, & Bitner, 2013).

Elg et al. (2011) determined that medical service designers and providers understand the technical and functional aspects of medical services that are important to the consumers (Elg et al., 2011). In order to improve the success rate of services, consumers can participate by sharing information, providing opinions and suggestions, and participating in shared decision-making (Gallan et al., 2013)

Jones (2013) referred to the benefits to decision-makers and all professionals in the healthcare sector. These professionals benefit from having more practical tools and experiences related to user centeredness and service design.

Many authors agree that consumer engagement is critical to the success of complex and long-term service experience in the health sector. Therefore consumer engagement and the co-creation of the service is essential. (Gallan et al., 2013; Hausman, 2004; Spanjol et al., 2015).

In general, the increase in consumer effort in medical services is related to the increase in service satisfaction and the overall quality of life (Sweeney, Danaher, and McColl-Kennedy, 2015).

The increasing need for efficiency and effectiveness of the services in healthcare allowed an evolution of the technology and standardisation of processes. The overly focused on it often ignores the human-centered aspects of care, and consequently, the caregiver-patient relationship will suffer an interruption. Technological advances are changing healthcare delivery. Technology and standardisation create emotional distance and the fact that they create physical distance weakened the ability of caregivers to respond

therapeutically to patients. Galarza (2013) mentioned that it could create physical distance between caregivers and patients.

There is a growing need to combine technology with patient-centric care. Patient care has become task-oriented (Winton et al., 2013). In this way, services are related to "medical" interventions rather than patients and their families.

### 2.3 Patient experience

Patient experience is an indicator that reflects the quality of care received. As Larson (2018) mentioned, this indicator is broadly composed of three domains: effective communication, respect and dignity and emotional support.

Roto et al. (2011, 6-7) also emphasises that the user experience is unique, and previous experiences and expectations influence it, and rooted in the social and cultural environment in which this occurs. They mentioned the main factors that influence the user experience. The three main categories were the context, the users' state (motivations, mood, current mental and physical resources and expectations) and the system (functionality, aesthetics, and interactions) (Figure 5).

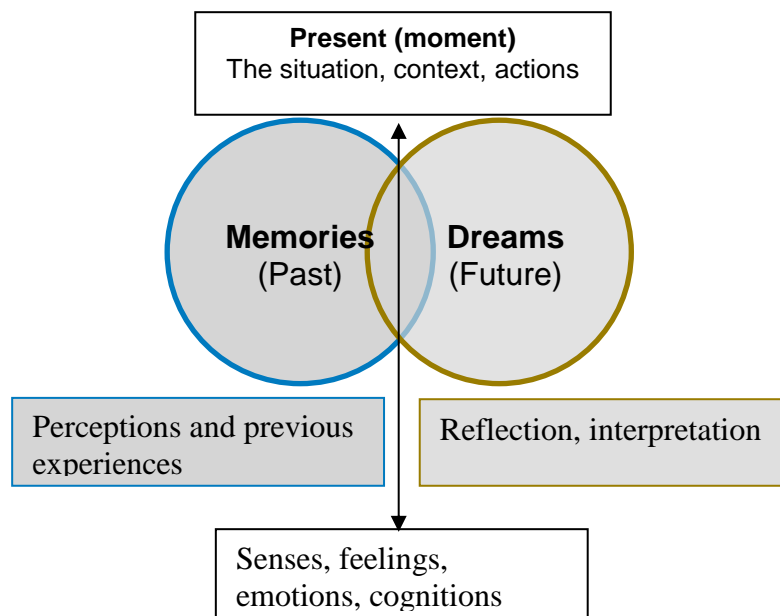


Figure 5. Illustration of user experience formation based on Sleeswijk Visser (2009) and Roto et.al(2011)

Jha (2017) records that patient experience can be defined as "the sum of all interactions, shaped by an organisation's culture that influences patient perceptions across the continuum of care." In his viewpoint, effective engagement is also connected with the

opportunity given to patients and their respective families to express their choices in caregiving.

Berry et al. (2006) mentioned customer satisfaction as the pleasurable emotional state of customers' feelings as the consequence of their experience in the organisation.

According to the literature, there are six variables that are more mentioned in terms of the patient experience. These variables are represented in the below figure (Jha, 2017).

Hierarchy of variables based on the frequency of mention in reviewed literature

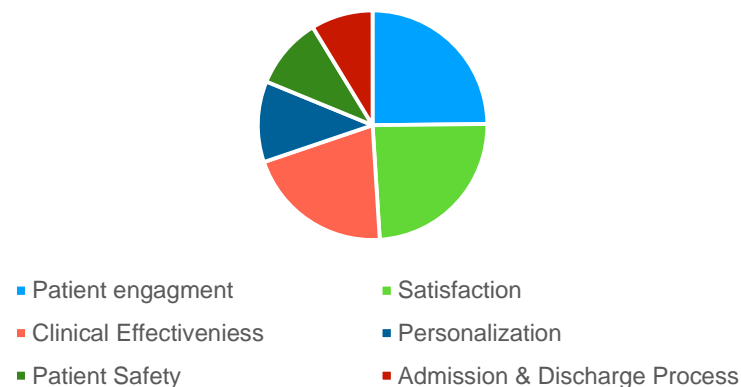


Figure 6. Hierarchy of variables based on the frequency of mention in reviewed literature (Based on Jha,2017)

Firstly, patient engagement, the second most commonly mentioned variable is patient satisfaction, which reveals the quality of healthcare received during the entire experience. Improving this satisfaction is a priority for healthcare providers.

The third most frequently mentioned variable is clinical effectiveness, which focuses on optimisation and personalisation, while finding clinical solutions also creates a personalised treatment plan. Personalisation is seen as the fourth variable mentioned.

Patient safety is another of the six variables, and the World Health Organization defines patient safety as 'the prevention of errors and adverse effects to patients associated with healthcare'.

The last variable and not the least important is the admission and discharge process, and these variables matter to the patient as much as the care delivery itself through the first and last impression in patient experience.

According to Lee (2019), the patient experience gives us information about an individual's perception during all points of contact. Moreover, allow us to understand if their experience meets the individual's expectations or not.



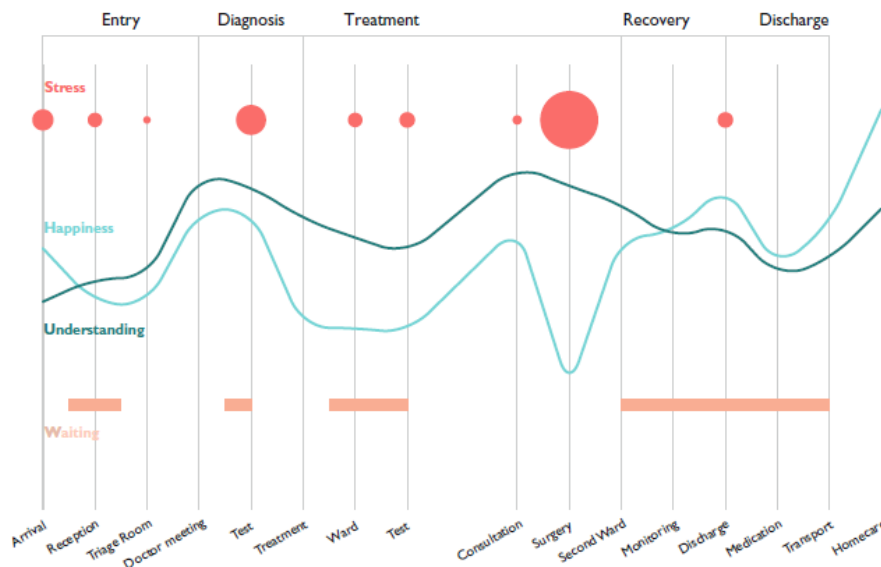


Figure 7. Patient's emotional journey from arrival to going home (Bailey,2018)

Gillespie (2018) goes more profoundly and shows that patients' experiences are directly related to caring. Caring when the doctors allow their individuality to interact with the patient's individuality. Being genuine is the essence of caring and making a difference in the patient experience process.

Butt et al. (2013) mentioned three aspects that contribute to lower healthcare service satisfaction: a lack of communication, the caregivers' inconsistencies in care delivery, and caregivers' increasing reliance on technology.

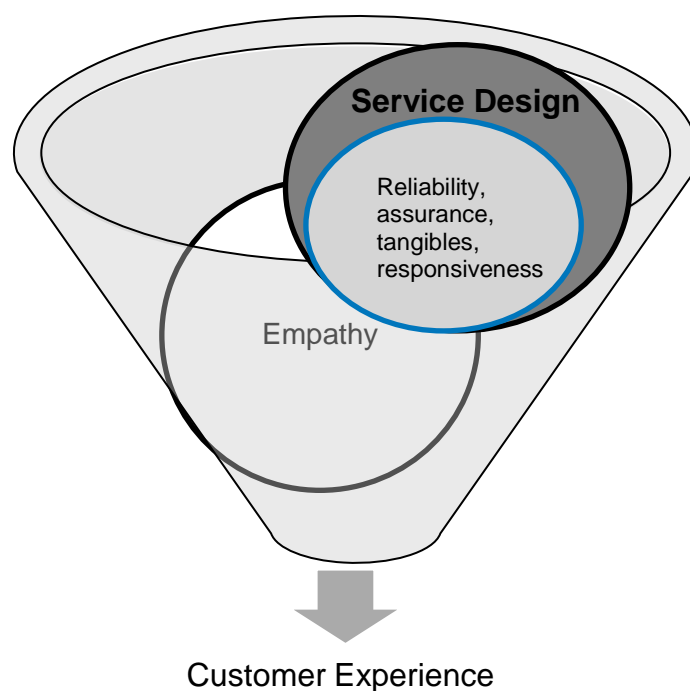


Figure 8. Service design as a turbo-charger of quality, experience, and performance (Based on Andreassen et al, 2015)

Andreassen et al. (2015) believed that to achieve a good customer experience there are many aspects which could be improved with the service design as reliability (do you deliver as promised?), assurance (does the organisation inspire confidence?), tangibles and responsiveness. The empathy with the patients aligned with these improvements could positively impact the experience of the user. Service design has an essential role in achieving a better experience. It is an example of a turbo-charger of quality, experience and performance.

## **2.4 The critical analysis**

According to the literature is evident the convergent opinions about the positive impact which service design can take in different services. As Meroni (2008) mentioned in his studies, service design is related to problem setting and problem-solving. The problem here is related to the lack of knowledge and experience on improving the service with the patients.

Managers are usually willing to involve patients in these improvement plans, but this is hard, thus lacking experience. How involve patients? What are the best strategies to do it? Aligned with this lack of experience, another challenge is related to power, political, and ethical issues. Political barriers related to data sharing, thus the lack of trust, guidelines, and restrictive policies. Legal factors such as ownership, copyright and data privacy will affect how data is shared and used.

Medical service designers need to promote the interaction between multiple professionals and users to create the co-creation among people at various organisational levels. Healthcare designers need to be focused on the patient and all professionals as physicians, nurses, pharmacists and other providers in the healthcare ecosystem. This focus must be on the front-end and back-end processes to manage each healthcare journey.

To improve the implementation and impact of service design in companies, service design needs to be better intertwined with organisational processes. Another aspect is linked with the culture and structure of different health organisations and departments at the same organisation. Each case is different, and this is the main challenge. The service design needs to understand all stakeholders' motivations and the support methods that involve all these

users. Service design also needs to be better infused into the services design practices to make the transaction towards service easier.

Today technology is running our society, and there is reduced information about applying technology and combining it to increase the patient decision power without compromising the relation and proximity with health professionals. This is another aspect that needs to be developed.

The literature shows us the importance of patients' engagement to improve their experience of them. More engaged patients easily accept and adhere to treatment. Patients are in a better position which reduces the chance for re-hospitalisation and decreases costs. Unfortunately, the evidence is weak, and it is essential to investigate to find empirical support.

There is a lack of information in the literature about mapping and visualising the patient experience. The patient's journey is complex and needs to be understandable to make the necessary changes to become the best experience possible for the patient and staff. The proposed research can be an instrument to make a model that can be conceivable to understand how and when service design can positively transform service and how it can be evaluated. For the purposes, we asked the following question: How Service Design Can Improve the Patient Experience in a Portuguese Cardiovascular Service?

We need to understand how the changes can be positive for the patient experience and positive for the service staff. Often service design is negatively cognate with loss of time. Furthermore, time is essential to recognise the service gaps. When the gaps are identified, the service can be improved with a significant impact. We need to demystify the complexity and find the model that could address the primary health journey issues.

Often the gaps in health services were linked with the lack of training the providers and staff aligned with the poor supervision.

The idea was that cardiology department staff (as well as other stakeholders) could, in this way, gain experiences as well as the practical framework (tools, methods) that could also be utilised in other similar development projects with other clinics and departments of healthcare.

This dissertation is essential to focus on the role of service context and environment as a critical element in experience formation. The analysis should also focus on understanding and identifying the central issues related to the construction of experience in the specific physical space and environment and the main context issues related to the positive or negative impact on the experience.

How can design create those positive, unforgettable and affective experiences? It is essential to remind that services always include a level of unpredictability due to the subjective nature of the service.

The service design should focus on touchpoint components: the processes and practices, the objects related to the service processes and encounters, service environments and physical surroundings, and the behaviour of the people involved. (Jaakkola et al., 2015, 190). To measure the impact of service design on the patients' experience is essential to analyse all these touchpoints. The experience is formed based on the user's response to those elements.

The role of the service design needs to be clear there are a need for tools and methods to re-frame problems and prioritise them to build creative solutions to these issues.

Table 2.4.1 Studies on SD in Healthcare

| <b>Author</b>                                | <b>Title</b>                                                               | <b>Journal<br/>(Year)</b> | <b>Main Issues</b>                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------|----------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vargo &amp; Lusch,</b>                    | Institutions and axioms: An extension and update of service-dominant logic | 2016                      | The combination of tangible and intangible elements can be arranged appropriately to provide consumers with a value proposition.<br>More research is needed to understand how to integrate design ideas into service practices and processes.                                                                                                                                                                            |
| <b>Courtney Sues &amp; Makarand Mody</b>     | The influence of hospitable design and service on patient responses        | 2017                      | In this study the interviews with limited time may affect participant responses. Similarly, due to the inaccessible interviewees in the demographic field under the age of 60. The results may not be representative of the entire population.                                                                                                                                                                           |
| <b>Bitner, Ostrom, Morgan and Brown</b>      | Service Blueprinting: A Practical Technique for Service Innovation''       | 2008                      | Design is a complex term that involves products or services, user experience, processes and systems. The main question for managers is whether the company can manage the experience systematically. To effectively design and manage the customer experience, it is necessary to provide a series of clues that can meet or exceed customer expectations as a whole.<br>How to reduce the unpredictability of services? |
| <b>Goldstein, Johnston, Duffy, &amp; Rao</b> | The service concept: the missing link in service design research?          | 2002                      | Intentional configuration of essential physical and non-physical elements in the service system.<br>How do researchers determine the gap between customer expectations and perceptions related to service recovery? Furthermore, how do we determine the gap between the provider's perception of customer expectations (transformed into strategic intent) and real customer expectations?                              |

|                                                                                      |                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Shaw et al</b>                                                                    | Beyond “implementation”: digital health innovation and service design                        | 2018 | SD does not simply improve existing processes and work processes but reshapes service processes. Treating technology adoption as an iterative process involving complex interactions between tools, teams, and newly established routines can help the team anticipate new services arising from the adoption of technology, rather than the addition of new forms of data input and communication.                    |
| <b>Mager</b>                                                                         | Methods and Processes of Service Design.                                                     | 2009 | SD is the activity of planning and organizing people, infrastructure, communication and material components of a service                                                                                                                                                                                                                                                                                               |
| <b>Polaine et al</b>                                                                 | Service design: From insight to inspiration                                                  | 2013 | SD as the design with people rather than just for them                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Malmberg</b>                                                                      | Building Design Capability in the Public Sector: Expanding the Horizons of Development       | 2017 | The problem needs to be understood, the motivations of all the different stakeholders and the support methods involving users. It implies a large responsibility for the dissemination of design in the organization which is left on the participating individuals, without giving them support or guidance on how to do it (Malmberg, 2017).                                                                         |
| <b>Saffer</b>                                                                        | Designing for interaction. Creating smart applications and clever devices                    | 2007 | Issues that play an essential role in the patient experience: interior decoration, lighting, sound and smell.                                                                                                                                                                                                                                                                                                          |
| <b>Lee, D</b>                                                                        | A model for designing healthcare service based on the patient experience                     | 2017 | Experiences among patients and the provider staff are basic segments of patient encounters. The design of medical services with thought of significant worth of co-creation should consider both patient and provider experiences at encounters or touchpoints. A well-designed healthcare service process can have an impact on care quality improvement through the experiences of patients and providers. delivery. |
| <b>Robbins, D. A., Mattison, J. E., &amp; Dorrance, K. A.</b>                        | Person-Centricity: Promoting Self-Determination and Responsibility in Health and Health Care | 2018 | “Person-centricity” is a concept related to give individuals more authority, autonomy, education, responsibility, and accountability for pursuing health and health care.                                                                                                                                                                                                                                              |
| <b>Gillespie, H., Kelly, M., Gormley, G., King, N., Gilliland, D., &amp; Dornan,</b> | How can tomorrow’s doctors be more caring? A phenomenological investigation.                 | 2018 | Caring communication was not restricted to consultations. It included being welcomed and updated on waiting times and test results. Caring was not determined by the doctor's technical ability to treat disease or with the ability to behave empathically. Caring comprise both.                                                                                                                                     |

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|                                                                 |                                                                                          |      |                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Larson, E., Sharma, J., Bohren, M. A., &amp; Tunçalp, Ö.</b> | When the patient is the expert: measuring patient experience and satisfaction with care. | 2019 | Clarity in reasoning and accuracy in utilizing person-centered measures will advance the science and practice of delivering respectful and effective health care. Expectations can be assessed qualitatively or quantitatively. |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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Source: Self-elaborated

### 3. Research methodology

The methodology is the tool that steers any dissertation towards information gathering and final results. The present study has been divided into different steps.

The first step is the literature review based on bibliographic research. The second step was the theoretical approach, which consisted of applying the theoretical concepts to the field of observation and developing the eight research questions that are linked to specific research objectives. The research questions and the resulting research objectives allow for a narrowing and consistent focus of the topics that will be addressed in this research.

The table below provides a clear overview of the research tools and objectives.

Table 3.1.1 Relation between literature review, objectives and research questions

| Objectives                                                                                                                                            | Research Questions                                                                                                                                                                                                                                                                                                                                 | Literature Review                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OBJ 1: To evaluate the patient experience in a Portuguese cardiovascular service duo the service design.                                              | (Q1) How Service Design Can Improve The Patient Experience in a Portuguese Cardiovascular Service?"<br>(Q2) Are the environmental characteristics of the service as valued by patients as by health professionals?"<br>(Q3) How can we identify gaps between provider perceptions of patient expectations and identify real patient expectations?" | Courtney Suess & Makarand Mody (2017);<br>Meroni(2008);<br>Polaine et al (2013)<br>Tina Janamian et al. (2016)<br>Danaher & Gallan (2016)<br>Malmberg(2017)<br>Ostrom et al. (2015)<br>Bodine (2012)<br>Teixeira et al. (2017)<br>Shaw et al (2018) |
| OBJ 2: To identify factors that affect patient experience in a Portuguese cardiovascular service.                                                     | (Q4) Which factors can affect the patient experience in a Portuguese cardiovascular service? Are there some factors that have more impact on patient experience?<br>(Q5) What are the barriers to improving patient experience and design of service?<br>(Q6) Processes automation and telehealth have a good impact on patient experience?        | Shaw et al. (2018)<br>Saffer(2007)<br>Sweeney, Danaher, and McColl-Kennedy (2015)<br>Larson (2018)<br>Jha (2017)<br>Lee (2019)<br>Gillespie (2018)                                                                                                  |
| OBJ 3: To formulate recommendations to Portuguese cardiovascular service management in terms of increasing the patient experience duo service design. | (Q7) How can design thinking be integrated into service practices and processes?<br>(Q8) How patients' feedback can improve the service?                                                                                                                                                                                                           | Vargo & Lusch (2016);<br>Mager(2009)                                                                                                                                                                                                                |

Source: Self-elaborated

A quantitative, analytical, cross-sectional study was developed based on answers given by Portuguese healthcare professionals of cardiology units and patients of cardiology units from

Portugal and in the Islands. Data were collected using two different questionnaires, according to if they are health providers or patients.

Table 3.2.1 Health provider Sample (N=30)

|                               |                                                                               |
|-------------------------------|-------------------------------------------------------------------------------|
| Gender                        | Female / Male                                                                 |
| Age                           | <=20,21-40, 41-60, 61-80, >80                                                 |
| Marital Status                | Single, married, widowed, divorced                                            |
| Profession in healthcare unit | Doctor, nurse, administrative, superior diagnostic and therapeutic technician |
| Region of Portugal            | North, central, south, islands                                                |
| Healthcare unit               | Private/Public                                                                |

Source: Self-elaborated

Table 3.2.2 Patients Sample (N=30)

|                                                                    |                                                                                                                                                                |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gender                                                             | Female / Male                                                                                                                                                  |
| Age                                                                | <=20,21-40, 41-60, 61-80, >80                                                                                                                                  |
| Marital Status                                                     | Single, married, widowed, divorced                                                                                                                             |
| Literacy education completed                                       | Secondary Education, Bachelor's Degree or Equivalent, Master's Degree or Equivalent, PhD                                                                       |
| Occupation                                                         | Student, Student-Worker, Self-employed, Employed, Unemployed, Retired                                                                                          |
| Monthly income of their household                                  | <1000, 1000-2000, 2001-3000, 3001-4000, >4000                                                                                                                  |
| How often patients attend cardiology services                      | 1 every 6 months, once a year, every 2 years, occasionally                                                                                                     |
| Cardiology exams performed                                         | Yes/no                                                                                                                                                         |
| Region of Portugal                                                 | North, central, south, islands                                                                                                                                 |
| Healthcare unit                                                    | Private/Public                                                                                                                                                 |
| Level of satisfaction regarding the cardiology service/or services | Parameterized from 1 to 5, where: 1 - "not at all satisfied", 2 - "very little satisfied", 3 - "not very satisfied", 4 -" satisfied "and 5 -" very satisfied " |

Source: Self-elaborated

A self-administered questionnaire was used. The questionnaire was different according if it is a patient or a health provider. The data collection was conducted from July to September 2021. Health providers and patients were informed about the aim and purpose of the study, as well as the guarantee of confidentiality of answers. All healthcare professionals from cardiology units and patients from cardiology units were included in the study. All others were excluded.



## 4. Data analysis

Statistical analysis involved descriptive statistical measures (absolute and relative frequencies, means and respective standard deviations) and inferential statistics. Spearman's correlation coefficient and the Mann-Whitney test were used. The level of significance to reject the null hypothesis was set at  $(\alpha) \leq .05$ .

Statistical analysis was performed with SPSS (Statistical Package for the Social Sciences) version 27 for Windows.

### 4.1 Patients' Questionnaire

#### 4.1.1. Sample characterization

The data refer to a total of 30 patients. The majority were female (83.3%), aged between 21-40 years (53.3%), single (60%), with a university degree (60%), employed (60.0%) and household income between 1000 and 2000 euros (50%).

Table 4.1.1.1 Sociodemographic characterization (N = 30)

|                                 | N  | %    |
|---------------------------------|----|------|
| <i>Gender</i>                   |    |      |
| Female                          | 25 | 83,3 |
| Male                            | 5  | 16,7 |
| <i>Age</i>                      |    |      |
| 21-40 years;                    | 16 | 53,3 |
| 41-60 years;                    | 10 | 33,3 |
| 61-80 years;                    | 4  | 13,3 |
| <i>Marital Status</i>           |    |      |
| Married                         | 11 | 36,7 |
| Divorced                        | 1  | 3,3  |
| Single                          | 18 | 60,0 |
| <i>Academic qualifications</i>  |    |      |
| Secondary Education             | 6  | 20,0 |
| Bachelor's Degree or Equivalent | 18 | 60,0 |
| Master's Degree                 | 6  | 20,0 |
| <i>Professional situation</i>   |    |      |
| Employed;                       | 18 | 60,0 |
| Student                         | 3  | 10,0 |
| Student-Worker                  | 5  | 16,7 |
| Retired                         | 4  | 13,3 |
| <i>Household Income</i>         |    |      |
| <1000                           | 3  | 10,0 |

|           |    |      |
|-----------|----|------|
| 1000-2000 | 15 | 50,0 |
| 2001-3000 | 10 | 33,3 |
| 3001-4000 | 2  | 6,7  |

Source: Self-elaborated

#### 4.1.2. Results

All patients had already attended a cardiology service (100%), and their frequency was occasional (66.7%).

Table 4.1.2.1 Cardiology services

|       | N  | %     |
|-------|----|-------|
| Yes   | 30 | 100,0 |
| Total | 30 | 100,0 |

Source: Self-elaborated

Table 4.1.2.2 Regularity of attendance at the cardiology service

|                  | N  | %     |
|------------------|----|-------|
| Once a year      | 4  | 13,3  |
| 1 every 6 months | 3  | 10,0  |
| 1 every 2 years  | 3  | 10,0  |
| Occasionally     | 20 | 66,7  |
| Total            | 30 | 100,0 |

Source: Self-elaborated

A very high percentage indicated that they had already performed electrocardiograms, echocardiograms, stress tests, maps, holter, catheterisations (or other cardiology tests (66.7%), 76.7% of which were performed in the central region of the country.

Table 4.1.2.3 Cardiology exams

|       | N  | %     |
|-------|----|-------|
| No    | 2  | 6,7   |
| Yes   | 28 | 93,3  |
| Total | 30 | 100,0 |

Source: Self-elaborated

Private healthcare organizations (63.3%) were the most frequented.

Table 4.1.2.4 Healthcare organizations

|         | N  | %     |
|---------|----|-------|
| Private | 19 | 63,3  |
| Public  | 11 | 36,7  |
| Total   | 30 | 100,0 |

Source: Self-elaborated

Regarding the level of satisfaction with the cardiology service/or services, 30% consider themselves very satisfied while 20% consider themselves not very satisfied.

Table 4.1.2.5 Satisfaction level

|                    | N  | %     |
|--------------------|----|-------|
| Not very satisfied | 6  | 20,0  |
| Satisfied          | 15 | 50,0  |
| Very Satisfied     | 9  | 30,0  |
| Total              | 30 | 100,0 |

Source: Self-elaborated

The location of the clinic or hospital was rated as good by almost all patients (96.7%).

Table 4.1.2.6 Good Location

|       | N  | %     |
|-------|----|-------|
| No    | 1  | 3,3   |
| Yes   | 29 | 96,7  |
| Total | 30 | 100,0 |

Source: Self-elaborated

- **Service Coordination:**

The highest-rated dimensions of the cardiology service were the admission process (4.03) and the clarity of staff communication (3.83).

Table 4.1.2.7 About Cardiology Services

|                                                        | Mean | DP  |
|--------------------------------------------------------|------|-----|
| I consider the admission process well organized        | 4,03 | ,71 |
| I consider the attendance hours appropriated           | 3,77 | ,72 |
| I consider that the staff provides clear information   | 3,83 | ,69 |
| I consider the prices of medical services appropriated | 3,53 | ,93 |

|                                                                       |      |      |
|-----------------------------------------------------------------------|------|------|
| I consider scheduling exams and appointments a quick and easy process | 3,53 | 1,07 |
| Regarding waiting time: I am usually attended on time                 | 3,50 | ,93  |

*Subtitle: 1 – Never 5 - Always*

Source: Self-elaborated

- Emotional Support:

The emotional support dimensions were also rated well, as their mean values are close to point 4 on the rating scale (often).

Table 4.1.2.8 Emocional Support

|                                                                                                     | Mean | DP  |
|-----------------------------------------------------------------------------------------------------|------|-----|
| Do you feel that health professionals do their best to discuss your anxieties and fears (emotions)? | 3,80 | ,92 |
| Did you always feel confident in the health professionals who attended you?                         | 4,27 | ,82 |

*Subtitle: 1 – Never 5 - Always*

Source: Self-elaborated

The emotions most commonly reported by patients during procedures and the hospital journey were anxiety (30%), nervousness and fear (13.3%).

Table 4.1.2.9 Emotions during hospital procedures

|             | N | %    |
|-------------|---|------|
| Anxiety     | 9 | 30,0 |
| Empathy     | 2 | 6,7  |
| Fear        | 4 | 13,3 |
| Tranquility | 3 | 10,0 |
| Nervousness | 4 | 13,3 |
| Confidence  | 2 | 6,7  |

Source: Self-elaborated

About 24% find it easy or very easy to find someone in the service with whom they can talk about their concerns, and 36.9% find it difficult or very difficult.

Table 4.1.2.10 Ease of finding someone to talk to

|               | N  | %    |
|---------------|----|------|
| Very easy     | 1  | 3,3  |
| Easy          | 6  | 20,0 |
| Somewhat easy | 12 | 40,0 |

|                |    |       |
|----------------|----|-------|
| Difficult      | 7  | 23,3  |
| Very Difficult | 4  | 13,3  |
| Total          | 30 | 100,0 |

Source: Self-elaborated

- **Patient centered Care**

The dimensions of the patient centered care that were best evaluated were "Do you consider communication to be clear and accessible an important factor at the time of consultations and examinations" (3.70) and "Were the warning signs mentioned that you should be aware of at home?" (3.60).

Table 4.1.2.11 Patient centered Care

|                                                                                                                                              | Mean | DP   |
|----------------------------------------------------------------------------------------------------------------------------------------------|------|------|
| Do you ever feel like the professionals were talking about your clinical situation, like you weren't listening or present?                   | 2,13 | ,77  |
| Do you remember any situation where you were not treated with respect and dignity?                                                           | 1,80 | ,84  |
| Have you ever felt a lack of empathy on the part of health professionals?                                                                    | 2,20 | ,92  |
| Does it consider communication to be clear and accessible, which is an important factor in consultations and examinations?                   | 3,70 | 1,44 |
| When you ask important questions to a health professional, do you feel that they answer you in a way that you understand?                    | 3,40 | 1,38 |
| Has the necessary information and explanation always been given, so that you leave the consultation or tests clarified about your condition? | 3,37 | 1,32 |
| Was the purpose of the medication always fully explained?                                                                                    | 3,47 | 1,33 |
| Were the side effects mentioned by the health professional who prescribed them?                                                              | 3,10 | 1,34 |
| Were the warning signs reported that you should be watching at home?                                                                         | 3,60 | 1,30 |

Subtitle: 1 – Never 5 - Always

Source: Self-elaborated

Half of the sample classifies its level of involvement in deciding its own treatment as involved or very involved, and 26.7% as little involved. A little more than half (56.7%) indicates that in addition to the communication in the period in which he remained in the clinic, he was provided with some other form of communication (Telephone or email address for further clarification).

Table 4.1.2.12 Involvement in decisions

|                                           | N  | %    |
|-------------------------------------------|----|------|
| Little involved                           | 8  | 26,7 |
| Not too little involved, not too involved | 7  | 23,3 |
| Involved                                  | 12 | 40,0 |

|               |    |       |
|---------------|----|-------|
| Very involved | 3  | 10,0  |
| Total         | 30 | 100,0 |

Source: Self-elaborated

- **Physical characteristics of the environment**

The statements related to physical characteristics that generated higher agreement rates were "Regarding the cleanliness of the service, do you consider the space a neat and clean space?", "Regarding the lighting? Are you satisfied with the lighting in the service?" (83.3%) and Regarding exams and consultations, do you feel that your privacy is respected? (80%).

Table 4.1.2.12 Physical characteristics of the environment

|                                                                                                   | 1     | 2     | 3     |
|---------------------------------------------------------------------------------------------------|-------|-------|-------|
| Do you consider that there is concern about the decoration of the service?                        | 23,3% | 40,0% | 36,7% |
| Do you consider that there is any care regarding the maintenance of the service and equipment?    | 6,7%  | 23,3% | 70,0% |
| Regarding the space available for consultation/examination, do you think it has an adequate size? | 10,0% | 26,7% | 63,3% |
| Regarding the exams and consultations, do you feel that your privacy is respected?                | 6,7%  | 13,3% | 80,0% |
| Is there much noise at the service?                                                               | 30,0% | 43,3% | 26,7% |
| Do you consider that the service usually has an adequate temperature?                             | 6,7%  | 40,0% | 53,3% |
| Concerning the cleanliness of the service, do you consider the space to be neat and clean?        | 3,3%  | 13,3% | 83,3% |
| Regarding the lighting? Are you satisfied with the lighting in the service?                       | 3,3%  | 13,3% | 83,3% |
| Regarding available food or beverages. Do you have access to these goods?                         | 30,0% | 23,3% | 46,7% |

Subtitle: 1 – 1 - Disagree 2 - Neither agree nor disagree 3 - Agree

Source: Self-elaborated

Most patients consider the physical aspects of the clinical environment important to their experience (66.7%).

Table 4.1.2.13 Importance of physical aspects

|                    | N  | %     |
|--------------------|----|-------|
| Not very important | 2  | 6,7   |
| Important          | 20 | 66,7  |
| Very important     | 8  | 26,7  |
| Total              | 30 | 100,0 |

Source: Self-elaborated

The environmental factors considered as most important for the patients' experience in the health organization service were Maintenance/equipment (6.70), cleanliness (6.53) and temperature (6.07).

Table 4.1.2.14 Enviromental factors for patients' experience

|                       | Mean | DP   |
|-----------------------|------|------|
| Noises                | 5,20 | 2,45 |
| Space                 | 6,03 | 2,10 |
| Cleaning              | 6,53 | 2,24 |
| Decoration            | 4,40 | 2,23 |
| Maintenance/equipment | 6,70 | 2,13 |
| Lighting              | 5,47 | 2,27 |
| Temperature           | 6,07 | 2,10 |
| Food available        | 5,03 | 2,26 |

Subtitle:: 1 - least important 8 - most important

Source: Self-elaborated

#### 4.1.2.15 List of variables

Patient Involvement  
Environment  
Direct Communication  
Personalization  
Safety  
Organization  
Proximity

Source: Self-elaborated

Respondents were challenged to order a list of variables, including involvement in decisions, environment, communication, personalisation, safety (error prevention), organisation of the admission and discharge process, and proximity and empathy relationship, according to the importance of each one had for their patient experience. By analysing the first 3 most mentioned factors, we can verify that the relationship of closeness and empathy, the patient's involvement in decisions and safety (error prevention) are the 3 most mentioned factors in the first 3 places of the ranking, being the most valued by patients.

The intention to recommend the service is 80%.

Table 4.1.2.15 Recommendation Intention

|              | N  | %     |
|--------------|----|-------|
| Indifferent  | 6  | 20,0  |
| Willing      | 16 | 53,3  |
| Very willing | 8  | 26,7  |
| Total        | 30 | 100,0 |

Source: Self-elaborated

A high percentage (70%) is in favour of teleconsultations.

Table 4.1.2.16 Teleconsultations

|       | N  | %     |
|-------|----|-------|
| No    | 9  | 30,0  |
| Yes   | 21 | 70,0  |
| Total | 30 | 100,0 |

Source: Self-elaborated

The correlation coefficient between the frequency with which patients attend cardiology services and the level of satisfaction regarding the cardiology service/or services is not statistically significant and is very weak ( $r_{sp} = .078$ ,  $p = .681$ ).

Table 4.1.2.17 Correlation frequency and satisfaction level

|           | Satisfaction |
|-----------|--------------|
| Frequency | ,078         |

Source: Self-elaborated

The correlation coefficient between the level of satisfaction regarding the cardiology service and the intention to recommend is significant, positive and weak ( $r_{sp} = .336$ ,  $p = .069$ ). As the coefficient is positive, the higher the satisfaction with the service, the higher the intention to recommend the service.

Table 4.1.2.18 Correlation satisfaction level and intention to recommend service

|                | Satisfaction |
|----------------|--------------|
| Recommendation | ,336         |

Source: Self-elaborated

The intention to recommend the cardiology service is higher in male patients (4.20 vs 4.04), although the difference is not statistically significant,  $MU = 55.500$ ,  $p = .706$ .



Table 4.1.2.19 Recommendation willingness and gender

|                            | Female |     | Male |     | Sig. |
|----------------------------|--------|-----|------|-----|------|
|                            | M      | DP  | M    | DP  |      |
| Recommendation willingness | 4,04   | ,73 | 4,20 | ,44 | .706 |

Source: Self-elaborated

The intention to recommend the cardiology service is higher in patients older than 40 years (4.07 vs 4.06), although the difference is not statistically significant,  $MU = 112.000$ ,  $p = 1.000$ .

Table 4.1.2.20 Recommendation willingness and age

|                            | 21-40 |     | > 40 anos |     | Sig. |
|----------------------------|-------|-----|-----------|-----|------|
|                            | M     | DP  | M         | DP  |      |
| Recommendation willingness | 4,06  | ,77 | 4,07      | ,62 | .706 |

Source: Self-elaborated

Intention to recommend cardiology service is higher in patients with superior education (4.13 vs 3.83), although the difference is not statistically significant,  $MU = 55.000$ ,  $p = .402$ .

Table 4.1.2.21 Recommendation willingness and academic qualifications

|                            | Sec. Education |     | Higher Education |     | Sig. |
|----------------------------|----------------|-----|------------------|-----|------|
|                            | M              | DP  | M                | DP  |      |
| Recommendation willingness | 3.83           | ,41 | 4,13             | ,74 | .402 |

Source: Self-elaborated

## 4.2 Professionals' Questionnaire

### 4.2.1. Sample characterization

Thirty professionals answered the questionnaire. Most were female (86.7%), aged between 21-40 years (73.3%), single (63.3%), cardiopneumologists and working in private healthcare units (60%). The Lisbon Region was the most represented (46.7%).

Table 4.2.1.1 Sociodemographic characterization (N = 30)

|               | N  | %    |
|---------------|----|------|
| <i>Gender</i> |    |      |
| Female        | 26 | 86,7 |
| Male          | 4  | 13,3 |

|                           |    |      |
|---------------------------|----|------|
| <i>Age</i>                |    |      |
| 21-40 years;              | 22 | 73,3 |
| 41-60 years;              | 8  | 26,7 |
| <i>Marital Status</i>     |    |      |
| Married                   | 9  | 30,0 |
| Divorced                  | 2  | 6,7  |
| Single                    | 19 | 63,3 |
| <i>Region of Portugal</i> |    |      |
| Lisbon                    | 14 | 46,7 |
| Other                     | 16 | 53,3 |
| <i>Profession</i>         |    |      |
| Cardiopneumologists       | 30 | 100  |
| <i>Healthcare Unit</i>    |    |      |
| Private                   | 18 | 60,0 |
| Public                    | 12 | 40,0 |

Source: Self-elaborated

#### 4.2.2. Results

The statements that generated the highest levels of agreement were "Consider that organisational performance is very dependent on both the personal and professional fulfilment of health professionals" (4.50) and "Regarding the professional/patient relationship, do you think that your service is concerned with providing a service that is centered on the patient and his or her concerns" (3.97).

Table 4.2.2.1 Healthcare Professional

|                                                                                                                                                                                                      | Mean | DP   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|
| Your remuneration is fair and appropriate for the position you hold.                                                                                                                                 | 1,57 | ,72  |
| Your working hours are appropriate and do not compromise your physical and mental health.                                                                                                            | 3,03 | 1,35 |
| You have the autonomy to organize and plan your daily routine.                                                                                                                                       | 3,40 | 1,16 |
| Do you think that organizational performance is very dependent on both the personal and professional fulfillment of health professionals?                                                            | 4,50 | ,77  |
| Regarding the professional/patient relationship, do you think that your organization is concerned with providing a service that is centered as much as possible on the patient and his/her concerns? | 3,97 | 1,32 |

*Subtitles: 1 - Strongly Disagree 5 - Strongly Agree*

Source: Self-elaborated

Satisfaction with teamwork is relatively high since 63.3% consider themselves satisfied or completely satisfied.

Table 4.2.2.2 Satisfaction with teamwork

|  | N | % |
|--|---|---|
|--|---|---|

|                      |    |       |
|----------------------|----|-------|
| Some satisfaction    | 1  | 3,3   |
| Indifferent          | 10 | 33,3  |
| Satisfied            | 15 | 50,0  |
| Completely satisfied | 4  | 13,3  |
| Total                | 30 | 100,0 |

Source: Self-elaborated

For the professionals surveyed, the most important factors for job satisfaction, in motivational terms, were the personal and professional relationship (36.7%) and the working conditions and health (33.3%).

Regarding the coordination of the service, the highest-rated statement was "I consider the admission process to be well organised" (3.37), while the least well rated was "I have witnessed some situation where patients had their exams done too late due to the cost of it" (2.20).

Table 4.2.2.3 Service coordination

|                                                                                                                        | Mean | DP  |
|------------------------------------------------------------------------------------------------------------------------|------|-----|
| I consider the admission process well organized                                                                        | 3,37 | ,80 |
| I consider the scheduling of exams and appointments a quick and easy process.                                          | 3,17 | ,74 |
| Regarding the waiting time. I think that your service has well organized appointments to avoid too long waiting times. | 3,03 | ,89 |
| I have witnessed some situations where patients had their exams done too late due to the cost of the exam.             | 2,20 | ,99 |

Subtitles: 1 – Rarely 5 – Always

Source: Self-elaborated

The statements that generated the highest levels of agreement were satisfaction with lighting (4.03), while the statement "Regarding available food or beverages do patients have access to these goods?" was the one with the highest levels of disagreement (2.43).

Table 4.2.2.4 Level of agreement

|                                                                                                           | Mean | DP   |
|-----------------------------------------------------------------------------------------------------------|------|------|
| Do you consider that there is concern about the decoration of the service?                                | 2,80 | 1,29 |
| Do you consider that there is any care regarding the maintenance of the service and equipment?            | 3,73 | 1,28 |
| Regarding the space available for consultation/examination, do you consider it to be of an adequate size? | 2,97 | 1,29 |

|                                                                                            |      |      |
|--------------------------------------------------------------------------------------------|------|------|
| Regarding exams and consultations, do you feel that the patients' privacy is respected?    | 3,80 | 1,27 |
| Is there a lot of noise at the service?                                                    | 3,20 | 1,06 |
| Do you consider that the service usually has an adequate temperature?                      | 3,67 | 1,12 |
| Concerning the cleanliness of the service, do you consider the space to be neat and clean? | 3,87 | 1,04 |
| Regarding lighting? Are you satisfied with the lighting of the service?                    | 4,03 | 1,06 |
| Regarding available food or beverages. Do patients have access to these goods?             | 2,43 | 1,40 |

*Subtitle:* 1 - Strongly Disagree 5 - Strongly Agree

Source: Self-elaborated

Almost half of the respondents considered the physical aspects of the clinical environment very important to the patients' experience, and 50% consider it important.

Table 4.2.2.5 Physical aspects of the clinical environment

|                     | N  | %     |
|---------------------|----|-------|
| Not important       | 1  | 3,3   |
| Important           | 15 | 50,0  |
| Extremely important | 14 | 46,7  |
| Total               | 30 | 100,0 |

Source: Self-elaborated

For healthcare professionals, the factors that most influenced the patient experience were closeness and empathy (27.8%), followed by Personalisation and Safety (error prevention).

Table 4.2.2.6 Factors that influence patient experience

|                      | N  | %    |
|----------------------|----|------|
| Patient Involvement  | 11 | 12,2 |
| Environment          | 12 | 13,3 |
| Direct Communication | 10 | 11,1 |
| Personalization      | 13 | 14,4 |
| Safety               | 13 | 14,4 |
| Organization         | 8  | 8,9  |
| Proximity            | 25 | 27,8 |

Source: Self-elaborated

The intention to recommend the service by the professionals surveyed is 86.7%.

Table 4.2.2.6 Recommendation willingness

|              | N  | %     |
|--------------|----|-------|
| Indifferent  | 4  | 13,3  |
| Willing      | 18 | 60,0  |
| Very willing | 8  | 26,7  |
| Total        | 30 | 100,0 |

Source: Self-elaborated

The percentage of professionals in favour of teleconsultations was 40%, while another 40% considered themselves undecided.

Table 4.2.2.7 Teleconsultations

|         | N  | %     |
|---------|----|-------|
| No      | 6  | 20,0  |
| Yes     | 12 | 40,0  |
| Perhaps | 12 | 40,0  |
| Total   | 30 | 100,0 |

Source: Self-elaborated

Most professionals (63.3%) consider that their service has kept up with the digital evolution (processes and equipment).

Table 4.2.2.8 Digital Evolution

|         | N  | %     |
|---------|----|-------|
| No      | 8  | 26,7  |
| Yes     | 19 | 63,3  |
| Perhaps | 3  | 10,0  |
| Total   | 30 | 100,0 |

Source: Self-elaborated

The correlation coefficient between satisfaction with teamwork and intention to recommend the service is not statistically significant and is very weak ( $r_{sp} = .017$ ,  $p = .928$ ).

Table 4.2.2.9 Correlation satisfaction with teamwork and intention to recommend service

|           | Satisfaction |
|-----------|--------------|
| Frequency | ,017         |

Source: Self-elaborated

Satisfaction with teamwork is higher in public health care facilities (3.83 vs 2.94), although the difference is not statistically significant,  $MU = 86.000$ ,  $p = .368$ .

Table 4.2.2.10 Satisfaction and healthcare Unit

|              | Private |     | Public |     | Sig. |
|--------------|---------|-----|--------|-----|------|
|              | M       | DP  | M      | DP  |      |
| Satisfaction | 2.94    | 2.4 | 3.83   | 2.7 | .368 |

Source: Self-elaborated

Satisfaction with teamwork is higher in men (4.25 vs 3.15), although the difference is not statistically significant,  $MU = 43.500$ ,  $p = .617$ .

Table 4.2.2.11 Satisfaction and gender

|              | Female |     | Male |     | Sig. |
|--------------|--------|-----|------|-----|------|
|              | M      | DP  | M    | DP  |      |
| Satisfaction | 3.15   | 2.4 | 4.25 | 3.7 | .617 |

Source: Self-elaborated

Satisfaction with teamwork is higher in professionals over 40 years old (3.75 vs 3.14), although the difference is not statistically significant,  $MU = 71.500$ ,  $p = .447$ .

Table 4.2.2.12 Satisfaction and age

|              | 21-40 |     | > 40 years |     | Sig. |
|--------------|-------|-----|------------|-----|------|
|              | M     | DP  | M          | DP  |      |
| Satisfaction | 3.14  | 2.6 | 3.75       | 2.4 | .447 |

Source: Self-elaborated

## 5. Discussion and Final Considerations

The results will be discussed in this chapter and confronted with existing literature, comparing expected findings and factual findings.

Starting with the first research question, "(Q1) How Service Design Can Improve The Patient Experience in a Portuguese Cardiovascular Service?" SD should be based on a deep understanding of needs, challenges, goals, wishes and experiences of patients as Prahalad and Ramaswamy (2004), Bettencourt (2010), Fitzsimmons and Fitzsimmons (2000) Ojasalo and Ojasalo (2015) and Koskinen et al. (2011) mentioned in their studies. Through this questionnaire, it was possible to evaluate the degree of satisfaction of patients in Portuguese cardiology care units to make this reflection about their experiences, understanding the challenges they face and the desires, to improve their experience in these health services. When we asked them about the satisfaction level, 80% of the respondents evaluated their satisfaction as satisfied or very satisfied, which can be justified by the results of the questions on the different dimensions that contribute to the service design and consequent patient experience.

We can start by dividing the questions into 5 different dimensions that contribute directly or indirectly to the patients' experience, namely the location of the clinic, the whole workflow, starting from the admission process, the emotional support, the real physical environment, and the patient-centricity dimension (involvement in decisions, personalised service). Starting by analysing the location of the chosen health unit, we noticed that 96.7% consider it a good location. 63.3 preferred to go to a private health unit. Regarding the service attended, the factors most mentioned in the units are the admission process (4.03) and clarity of communication from the staff (3.83). The emotional support dimensions were also rated well, as their mean values are close to point 4 on the rating scale (1-5).

At this point, it is pertinent to insert the second research question "(Q2) Are the environmental characteristics of the service as valued by patients as by health professionals?"

According to the physical aspects of the environment, the patients consider the cleanliness (83.3%), the lighting of the service (83.3%) and the respect for privacy (80%) as the strongest points in the units they attend or have attended. These answers coincided with the health professionals' opinion. The environmental factors that they consider to be of most concern in their unit are the lighting, cleanliness, and privacy. On the other hand, the physical factors that patients do not agree about are the decor of the service and the availability of food and beverages. For health professionals, the ones they consider least present are the same.

Comparing the factors that the units are most concerned about with the factors that patients are most concerned about, we understand a discrepancy. The environmental factors considered as most important for the patients' experience in the health organisation service were Maintenance/equipment (6.70), cleanliness (6.53) and temperature (6.07). Thus, the service design should focus the environmental factors on these aspects that the patient did not consider as present but consider important for their experiences such as Maintenance/equipment and temperature. When asked about the importance of the physical environment to their experience, most patients consider these aspects as important (66.7%) and once again, an idea shared by health professionals, where almost half of the respondents considered the physical aspects of the clinical environment very important to the patients' experience, and 50% consider it important.

With regard to the third research question, "(Q3) How can we identify gaps between provider perceptions of patient expectations and identify real patient expectations?" It is essential for medical service designers to promote the interaction between multiple professionals and users to create co-creation among people at various organisational levels. Healthcare designers need to be focused on the patient and all involved professionals. To

better answer this question, we need to analyse the factors that patients considered most important to their experience within all dimensions. Patients state that one of the most important factors for their experience is their involvement in the treatment itself and empathetic relationship, so these are two factors associated with clear communication that can reduce gaps between patients' real expectations and provider perceptions of these expectations.

It is essential to mention that the emotions most reported by patients during procedures at the hospital journey were anxiety (30%), nervousness and fear (13.3%).

Developing open communication, the freedom to talk about concerns, and allowing evaluation through questionnaires might be excellent ways to reduce these gaps. Is education a barrier? Since patients with higher education are more likely to recommend the service, we can assume that it is. As Larson (2018) mentioned, patient experience is broadly composed of three domains: effective communication, respect and dignity and emotional support, and this are not entirely present once the question related to the difficulty in finding someone in the service with whom they can talk about their concerns was the most worrisome, where 36.9% find it difficult or very difficult, which can be related with answers about the emotions during the workflow.

According to the literature and based on this questionnaire during the health workflow, there are some critical dimensions. Moreover, related to it that comes the fourth research question "(Q4) Which factors can affect the patient experience in a Portuguese cardiovascular service? Are there some factors that have more impact on patient experience?" Respondents were challenged to order a list of variables, including involvement in decisions, environment, communication, personalisation, safety (error prevention), organisation of the admission and discharge process, and proximity and empathy relationship, according to the importance of each one had for patient experience. By analysing the first three most mentioned factors, order by level of importance, we can verify that the relationship of closeness and empathy, the patient's involvement in decisions and safety (error prevention) are the three most mentioned factors in the first three places of the ranking, being the most valued by patients. Health professionals' perception about the most important factors was closeness and empathy (27.8%), followed by Personalisation and Safety (error prevention), a very close resemblance to the patient mentioned points. According to the Hierarchy of variables based on the frequency of mention in reviewed literature based on Jha (2017), the three more mentioned were Patient engagement, clinical effectiveness, and personalisation, which are significantly related to the variables mentioned by patients.



The barriers to improving patient experience are difficult to identify, still, I set out to answer the fifth research question "(Q5) What are the barriers to improving patient experience and design of service?" The service design needs to have a considerable understanding of the motivations of all stakeholders and the support methods that involve all these users, and this is not an easy task. Service design needs to be better intertwined with organisational processes to improve the implementation and impact of service in companies.

There is a need to improve the professional's fulfilment to be possible the best service possible because a happy worker can provide a better service. According to the health professionals' questionnaire, the statements that generated the highest levels of agreement were that organisational performance is very dependent on both the personal and professional fulfilment of health professionals (4.50) and regarding the professional/patient relationship, a service that is centered on the patient and their concerns" (3.97).

Therefore, the professionals think that to be easier to implement strategies, redesign the services, and improve organisational performance. The design specialists need to understand if there are good working conditions if the professionals are satisfied, and design a service that supports patient centric care. The least chosen factor by the professionals was satisfaction with remuneration. It means that most professionals are dissatisfied with the valorisation of their work, considering that the remuneration is not fair and appropriate for the position they hold. Despite this, satisfaction with teamwork is relatively high since 63.3% consider themselves satisfied or completely satisfied.

Nowadays, there is a lack of professionals and an excessive workload for professionals. There is a need to have more human resources and strategies to motivate professionals and team leaders to make this possible. An example is the possibility to have longer appointments, and consequently, patients can talk about their concerns and have the ability to make informed decisions about their treatment. At the same time, reduce the workload per professional.

Luxford, Gelb Safran, and Delblanco (2011, p. 513) argued that an obstacle to shifting from "provider-focused" to "patient-centric" is changing the employee's mentality. Donetto, Tsinakas, and Robert (2014) and Larkin, Boden, Newton (2015) considered that employees might also think that involving patients in improvement is time-consuming and will compete with daily tasks, and this is a barrier that we have to overcome, giving more time per health professional. An efficient management, leadership and design team are essential to do the success of the unit.

Related to processes automation and telehealth, it is pertinent to insert the sixth research question "(Q6) Processes automation and telehealth have a good impact on patient experience?"

Today technology is running our society, and there is a reduced information about how to apply technology and combine it to increase the patient decision power without compromising the relation and proximity with health professionals.

According to most health professionals (63.3%), they consider that their service has kept up with the digital evolution (in terms of processes and equipment). The questionnaire allows understanding the opinion not only of the professionals but also patients, about the teleconsultation's reality. Covid has likely shown the advantages of teleconsulting, but opinions differ. The percentage of health professionals against teleconsulting was 20%, while 30% of the patients do not favour teleconsultations. These individuals who are against teleconsulting probably value the proximity relationship more and are afraid of the depersonalisation of the service. This is one of the significant challenges when talking about teleconsultations and process automation. Galarza (2013) also mentioned that technology could create physical distance between caregivers and patients.

More practically comes the seventh research question "(Q7) How can design thinking to be integrated into service practices and processes?" Each unit has a different challenge. Mager (2009) mentioned that SD is the activity of planning and organising people, infrastructure, communication, and material components of a service, and this is an important task that needs to be well organised by specific people within an organisation. There must be someone responsible for understanding the motivation of the professionals. Create a mechanism for patients' feedback. Furthermore, in the end, design and redesign the service according to the need expressed by patients over time. The design of the service does not need to be something static. It needs to accompany the evolution of the times, the organisation's needs, and the patients' desires.

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