

# Patient-centered healthcare service development: a literature review

Mayara Ramos <sup>a</sup> | Fernando Antônio Forcellini <sup>b</sup>  
Marcelo Gitirana Gomes Ferreira <sup>c</sup>

<sup>a</sup> Federal University of Santa Catarina (UFSC), Department of Production Engineering: Florianópolis, Brazil.

<sup>b</sup> Santa Catarina State University (UDESC), Department of Design: Florianópolis, Brazil.

<sup>c</sup> Federal University of Santa Catarina (UFSC), Department of Mechanical Engineering: Florianópolis, Brazil.

\* Corresponding author: [mayara.amos@gmail.com](mailto:mayara.amos@gmail.com)

## ABSTRACT

Patient centred services and patient experiences have increasingly been related to service quality and efficiency of care. As a way to have patient centred services, healthcare organizations started involving patients in service improvement. Proper service design is another factor that influences service quality. Healthcare services, however, have presented issues in this aspect. Human Centred Design approaches can be a way for healthcare organisations to properly design services and deliver patient centred care. In this paper, we investigate through a literature review, what methods have been used to design or improve healthcare services and how they contributed to patient centred care. With literature analysis, we identified that Service Design, co-design and other design related approaches were used to bring patient participation, and highlighted improvements and barriers involved in their use. Although these processes faced some barriers, they had positive effects on services being patient centred, improving patient satisfaction and care. Despite the effort of using structured approaches to patient participation and service improvement, the organizations might still be (re)designing their services with inadequate processes.

**Keywords:** Healthcare Service, Human Centred Design, Patient Participation.

## INTRODUCTION

Societies have high expectations of the quality of the services provided to them, especially if they are provided by public agencies (Brasil and Ministério Da Saúde, 2007). To offer high-quality services, service providers have to design them properly. Successful services usually are the result of an appropriately designed structure and a well-organized process. To achieve this, organizations need to use or develop systemic processes for new service development (Scheuing and Johnson, 1989). In the service sector, there still is a less than systematic approach to service design, using informal processes. However, organizations that use formalized structured processes tend to have more satisfactory services (Kelly and Storey, 2000).

Healthcare organizations have presented issues with service design, having under detailed processes, and often out of step with modern design practices (Jun et al., 2014; Plsek, 1997). Healthcare organizations, like other services, need to use a structured design method to have a detailed service strategy and provide satisfactory services. The World Health Organization (WHO), also indicates that healthcare service delivery to be patient-centred (WHO 2010). Patient-centred practice was associated with improved health status and care efficiency

(Stewart et al., 2000) and similarly, there is a growing acknowledgment that improvement in quality comes from incorporating patient experience (Russ et al., 2013). Aiming to have patient-centred services, several countries adopted patient involvement or engagement policies. However, patient involvement process is slow (Ocloo and Matthews, 2016), and services are still not putting the patient first (Bate and Robert, 2006). Human Centred Design (HCD) and related topics such as Service Design and User Experience, can aid healthcare organizations with their service development/improvement issues and in providing patient-centred services, as they are structured methods that have at their core concern with the users' needs and experiences with the systems/services.

Although it is known that healthcare services face problems with proper service design, and that patient centred practice and patient experience have positive effects in the quality and efficiency of care; there are few studies that analyse how healthcare organizations are conducting service/development and improvement and how to do it in a patient centred way. So, in this paper, we explore what methods, models, and tools have been used to develop or improve healthcare services and how they relate to having patient-centred services through a systematic search of the literature. With these findings, we can analyse the approaches that have been used and what were the results and what still needs to be improved in this scenario.

## 1. HUMAN CENTRED DESIGN

Also called User Centred Design (UCD), HCD is a development approach to interactive systems. The objective of HCD is to make systems useful and usable, emphasising the users, their needs and demands, with the application of knowledge and techniques concerning usability and human factors. The use of HCD helps increase effectiveness and efficiency, improves the welfare of the human being, user satisfaction, accessibility and sustainability; and counteracts possible adverse health effects in its use, safety, and performance (ISO, 2010).

Norman (Norman, 2002) also states that HCD is based on user needs and interests, giving special attention to making products, or services, comprehensive and easy to use. To ensure that the user's needs and wants are satisfied, the users of the system must be represented throughout the process for producing usable and successful products (Maguire, 2001). These characteristics are reflected the principles of the human centred approach, which are: design is based upon understanding of users, tasks and environments; users are involved throughout design and development; design is driven by user-centred evaluation; the process is iterative; design addresses the whole user experience; and design team includes multidisciplinary skills and perspectives (Rubin and Chisnell, 2008; ISO, 2010)

Maguire (2001) discusses how usable systems can be achieved by a human-centred approach to design. According to Maguire, designing usable systems can increase productivity, reduce errors, reduce training time and the need for human support, improve user acceptance and enhance the company's reputation. The use of a human-centred approach to the development process can produce substantial economic and social benefits to the users, employers, and suppliers (ISO, 2010).

There are several approaches covered by the broad umbrella of HCD. These approaches include human factors and ergonomics, participatory design, usability measurements and evaluations, design for user experience, service design, transformation design, lead user

innovation, worth-centred design. As HCD has evolved and developed over time, the focus on protecting users from harm with usability has been diluted with a more versatile range of design objectives, along with the emergence of design for user experience (UX). At the same time, the human being who used to be reduced to an operator restricted to the users' role as a part of an information processing system has been replaced by the user as a more holistic and active contributor (Keinonen, 2010).

UX is a component of the HCD approach to system development. UX is the user's perception and responses resulting from the use of a product, system or service. It includes all the users' emotions beliefs, preferences, perceptions, physical and psychological responses, behaviours, and accomplishments that happen before, during or after use (ISO, 2010). UX is an approach to product/service development that incorporates direct user feedback throughout the design process aiming to reduce costs and create products/services and tools that meet user needs and have a high level of usability (UXPA, 2014).

Specifically related to the service area of studies, HCD is present on Service Design methodology and principles. Service design creates the interface of the service with the client and the details of the service journey; also is the process of creating the touchpoints and defining how they interact between themselves and the user (Technology Strategy Board and Design Council, 2014). The process of service design uses methods and tools to make the user experience consistent, desirable, useful, viable, aligned with the brand and commercially successful (Moritz, 2005). Stickdorn and Schneider (2010) propose five principles to service design: it should be user-centred, co-creative, sequential, evident and holistic. Co-creation usually occurs through co-design. Co-design brings the users to participate in the design process, working with the professionals to create solutions (Cottam et al., 2004). Co-design brings benefits that translate into better quality and more satisfactory services, and more user-focused (Steen et al., 2011).

## 2. METHODOLOGY

The systematic search process complied of three phases: plan, execution, and summarisation. The plan phase consisted of assembling a protocol for the search and selection of papers that would assist in answering these questions. The protocol specified that the search would be done on Scopus, ISI Web of Science and Pubmed databases. Two different strings of search were used to comply with the research questions. The first string was (("service design" OR "service develop\*") AND (healthcare)) with the objective of identifying models and tools used in healthcare service design. The second string used was (("service design" OR "service develop\*") AND ("human centered design" OR "user centered design" OR "user experience")), and it was analysed the use of HCD in service development in general, that could be applied to healthcare services. The protocol specified that the keywords used on the strings should be present in the title, abstract or keywords of the articles. Only papers published in Journals in English or Portuguese were included.

Besides searching in a healthcare database (Pubmed), the decision to search in multidisciplinary databases was made because the subject was a likely topic of research in several disciplines – design, engineering, service management, medicine, nursing, and others. Exclusions included papers where the subject involved digital services, software design, or information technology; along with papers where the subject involved medical procedures

or treatments; and any other paper that did not relate to the development or improvement of service systems. The search of the databases was executed on 29 January 2019.

The execution phase consisted on the implementation of the search on the databases and filtering the results. Three filters were applied to the search results regarding the exclusion criteria. The first filter was applied to the recovered results title, abstract, and keywords. The second filter involved reading the introduction and conclusion of the remaining papers. In the third filter, papers were read in their entirety. If the articles were not aligned with the search objectives, they were excluded, as were articles that met the exclusion criteria. Table 1 shows the numbers of articles found in each database, the number of duplicated papers and how many papers were analysed in each filter. Cited papers relevant to the research subject were identified through the analysis of the papers, and so were added to the selected papers.

**Table 1: Search and filtering results**

Search	Scopus	ISI	PubMed	Dup.	Filter1	Filter2	Filter3	Selected
S1	634	254	127	253	722	122	49	30
S2	125	46	14	47	137	58	21	10
Cited								3
<b>Total(not dup.)</b>								<b>40</b>

In the summarisation phase (content analysis), the data extracted from the selected articles were analysed using thematic analysis (Braun and Clarke, 2006). Braun and Clarke (2006) suggest a six-step process: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Data coding used an inductive approach, identifying themes within the articles. We identified two main themes in the data, which were divided into categories (Table 3).

A bibliometric analysis was conducted on the selected papers. It analysed the distribution of the publications through the years, identified the authors working on the subject, the places where these studies were published, and where they are occurring (i.e. countries and universities considered by the first author).

### 3. RESULTS

This section presents the bibliometric and content analysis of the selected articles. Table 2 presents the final portfolio of selected papers with an identity assigned to each paper.

**Table 2: Portfolio of analyzed papers**

ID	Reference	Search
0 1	Bate, P. and Robert, G. (2006), "Experience-based design: from redesigning the system around the patient to co-designing services with the patient", <i>Quality and Safety in Health Care</i>	C
0 2	Bate, P. and Robert, G. (2007), "Toward more user-centric OD: lessons from the field of Experience-Based Design and a case study", <i>The Journal of Applied Behavioral Science</i>	C
0 3	Fallon, S. et al. (2008), " 'Pizza, patients and points of view': involving young people in the design of a post registration module entitled the adolescent with cancer", <i>Nurse Education in Practice</i>	S1
0 4	Coad, J. E. et al. (2008), "Evaluating the impact of involving young people in developing children's services in an acute hospital trust", <i>Journal of Clinical Nursing</i>	S1

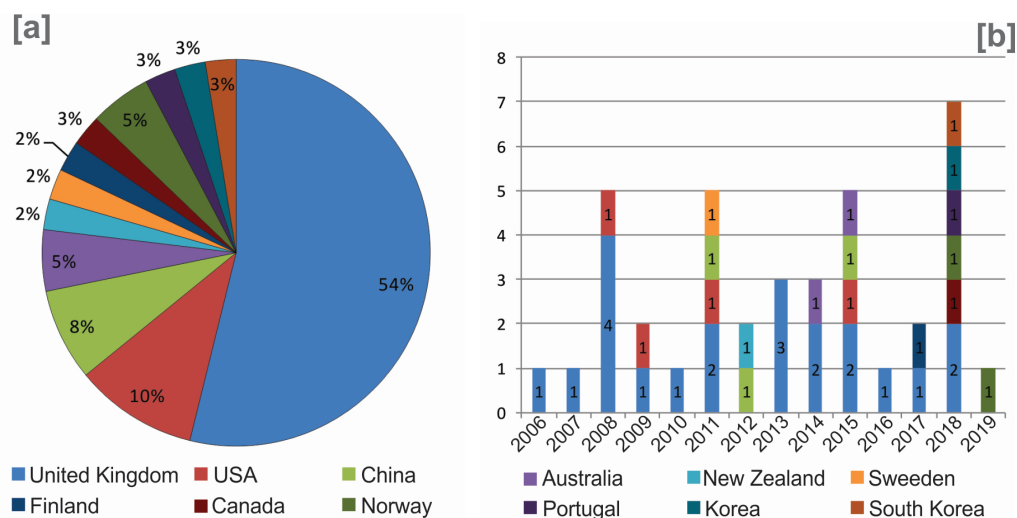
ID	Reference	Search
0 5	Wye, L., Shaw, A. and Sharp, D. (2008), "Designing a 'NHS friendly' complementary therapy service: a qualitative case study", <i>BMC Health Services Research</i>	S1
0 6	Fudge, N., Wolfe, C.D.A. and McKeivitt, C. (2008), "Assessing the promise of user involvement in health service development: ethnographic study", <i>British Medical Journal</i>	S1
0 7	Remus, B. (2008), "Addressing risk in the design of new healthcare services: a step-by-step methodology", <i>Journal of Healthcare Risk Management</i>	S1
0 8	Glushko, R.J. and Tabas, L. (2009), "Designing service systems by bridging the 'front stage' and 'back stage'", <i>Information Systems and e-Business Management</i>	S2
0 9	Forbat, L. et al. (2009), "Engaging patients in health care: an empirical study of the role of engagement on attitudes and action", <i>Patient Education and Counseling</i>	S1
1 0	Ticehurst, A., Ward, J. and Clarkson, J. (2010), "Barriers to design in healthcare", <i>Australasian Medical Journal</i>	S1
1 1	Wolstenholme, D. et al. (2010), "Design-led service improvement for older people", <i>Australasian Medical Journal</i>	C
1 2	Woo, J. et al. (2011), "Identifying service needs from the users and service providers' perspective: a focus group study of Chinese elders, health and social care professionals", <i>Journal of Clinical Nursing</i>	S1
1 3	Carr, V.L. et al. (2011), "Integrating evidence-based design and experience-based approaches in healthcare service design", <i>Health Environments Research and Design Journal</i>	S1
1 4	Lin, M.C. et al. (2011), "Service design and change of systems: human-centered approaches to implementing and spreading service design", <i>International Journal of Design</i>	S1/S2
1 5	Elg, M; et al. (2011), "Solicited diaries as a means of involving patients in development of healthcare services", <i>International Journal of Quality and Service Sciences</i> .	S1/S2
1 6	Sangiorgi, D. (2011), "Transformative services and transformation design", <i>International Journal of Design</i>	S2
1 7	Boyd, H. et al. (2012), "Improving healthcare through the use of co-design", <i>New Zealand Medical Journal</i>	S1
1 8	Hsu, M.Y. and McCormack, B. (2012), "Using narrative inquiry with older people to inform practice and service developments", <i>Journal of Clinical Nursing</i>	S1
1 9	El Enany, N., Currie, G. and Lockett, A. (2013), "A paradox in healthcare service development: professionalization of service users", <i>Social Science and Medicine</i>	S1
2 0	Bowen, S. et al. (2013), "How was it for you? Experiences of participatory design in the UK health service", <i>CoDesign</i>	S1
2 1	Armstrong, N. et al. (2013), "Optimizing patient involvement in quality improvement", <i>Health Expectations</i>	S1
2 2	Jun, G T; Morrison, C; Clarkson, P J. (2014), "Articulating current service development practices: A qualitative analysis of eleven mental health projects", <i>BMC Health Services Research</i>	S1
2 3	Farmer, J. and Nimegeer, A. (2014), "Community participation to design rural primary healthcare services", <i>BMC Health Services Research</i>	S1
2 4	Wainwright, D., Boichat, C. and McCracken, L.M. (2014), "Using the nominal group technique to engage people with chronic pain in health service development", <i>The International Journal of Health Planning and Management</i>	S1/S2
2 5	Lin, C.J. and Cheng, L.-Y. (2015), "An integrated model of service experience design improvement", <i>Service Industries Journal</i>	S2
2 6	Howland, S. and Fisher, K. (2015), "Looking through the patient lens: improving best practice for young people with juvenile idiopathic arthritis transitioning into adult care", <i>SpringerPlus</i>	S1/S2
2 7	Marquez, J.J., Downey, A. and Clement, R. (2015), "Walking a mile in the user's shoes: customer journey mapping as a method to understanding the user experience", <i>Internet Reference Services Quarterly</i>	S2
2 8	Trischler, J; Scott, D R. (2015), "Designing Public Services: The usefulness of three service design methods for identifying user experiences", <i>Public Management Review</i> .	S2
2 9	Donetto, S. et al. (2015), "Experience-based co-design and healthcare improvement: realizing participatory design in the public sector", <i>The Design Journal</i>	S1

Ramos, M., Forcellini, F. A. & Ferreira, M. G. G. (2021). Patient-centered healthcare service development: a literature review. *Strategic Design Research Journal*. Volume 14, number 02, May – August 2021. 423-437. DOI: 10.4013/sdrj.2021.142.04

ID	Reference	Search
30	Nimegeer, A. et al. (2016), "Community participation for rural healthcare design: description and critique of a method", <i>Health and Social Care in the Community</i>	S1
31	Borgstrom, E; Barclay, S. (2017), "Experience-based design, co-design and experience-based co-design in palliative and end-of-life care", <i>BMJ Supportive &amp; Palliative Care</i> .	S1/S2
32	Salgado, M; et al. (2017), "Using a service design model to develop the 'Passport to Safer Birth' in Nigeria and Uganda", <i>International journal of gynaecology and obstetrics</i> .	S2
33	Jun, G T; et al. (2018), "A participatory systems approach to design for safer integrated medicine management", <i>Ergonomics</i> .	S1
34	Snow, E M; Tweedie, K; Pederson, A. (2018), "Heard and valued: The development of a model to meaningfully engage marginalized populations in health services planning", <i>BMC Health Services Research</i> .	S1
35	Hjertstrom, H K; Obstfelder, A; Norbye, B. (2018), "Making New Health Services Work: Nurse Leaders as Facilitators of Service Development in Rural Emergency Services", <i>Healthcare</i> .	S1
36	Finn, V; Stephenson, J; Astin, F. (2018), "Patient preferences for involvement in health service development", <i>British Journal of Nursing</i> .	S1
37	Patrício, L; et al.. (2018), "Service Design for Value Networks: Enabling Value Cocreation Interactions in Healthcare", <i>Service science</i> .	S1
38	Han, N; et al. (2018), "Service design oriented multidisciplinary collaborative team care service model development for resolving drug related problems", <i>PLOS ONE</i> .	S1
39	Yu, E; Sangiorgi, D. (2018), "Service Design as an Approach to Implement the Value Cocreation Perspective in New Service Development", <i>Journal of Service Research</i> .	S2
40	Eines, T F; Angelo, E; Vatne, S. (2019), "Discourse analysis of health providers' experiences using service design", <i>Nursing open</i> .	S1

### 3.1. Bibliometrics

Here we analysed data about the 40 selected articles. Firstly, we analysed the data for the country where the studies originated. Only the first author data was analysed. As Figure 1 [a] shows, the papers are mostly from the United Kingdom and other developed countries. Only five papers were from developing countries. A possible reason for the majority of publications being from the UK might be that it is a policy of the National Healthcare Service (NHS) to use patient involvement in service development, improvement and planning (Fudge et al., 2008; Fallon et al., 2008; Ticehurst et al., 2010; Howland and Fisher, 2015; Forbat et al., 2009).





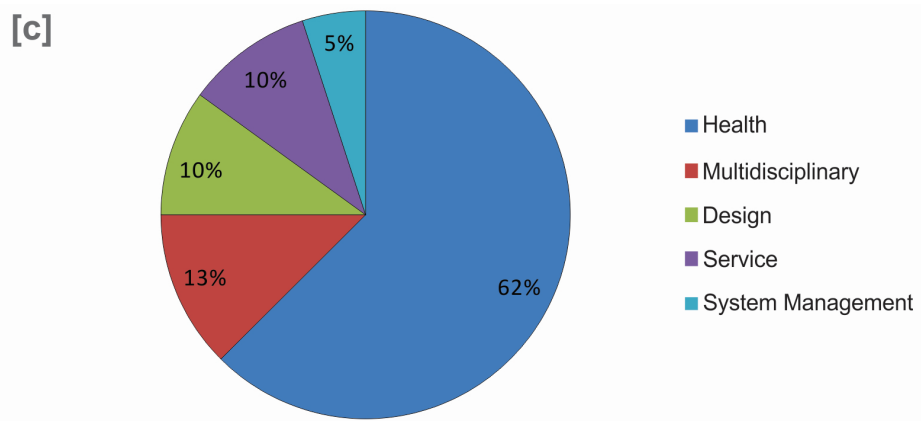


Figure 1: Bibliometrics charts

Figure 1 [b] presents the distribution of publications through the years related to the country of origin of the study. As the chart shows 2018 was the year with most publications (seven papers), followed by 2008, 2011 and 2015 with five publications each.

Regarding the area of study of the articles selected, most papers were published in health-related journals (25), as can be seen in Figure 1 [c]. The second area with the most publications was Multidisciplinary with five publications. The most frequent journals concerned with these areas of study were BMC Health Services Research, with four publications, followed by Journal of Clinical Nursing, with three publications.

It was found that regarding the authorship of the paper, Sangiorgi and Robert are the most frequent authors in the selected articles; both authors are listed in three papers – Sangiorgi: articles ID 13, 16, and 39; Robert: 1, 2, and 29. Bate co-authored two of Robert articles (1, 2). Other reoccurring co-authorships were Farmer and Nimegeer (23, 30), and Bowen, Wolstenholme, Cobb, and Dearden (11, 20).

### 3.2. Content analysis

Most of the selected papers focused on patient involvement in service improvement and management, and the use of human centred methods such as service design and co-design in healthcare services – 23 papers had a user-centred approach. Elements of service design and HCD were seen in the analysed papers: user input was present in 32 papers, 25 of the described processes/cases had multidisciplinary teams, 22 used design related tools, and 18 used co-design. The papers that had more elements of these disciplines were papers that discussed the Experience-Based Co-Design (EBCD) approach also called Experience Based Design (EBD) (papers ID: 01, 02, 11, 13, 17, 20, 29, 31). EBDC enables staff, patients and carers to work in partnership to co-design better services, reflecting on their experiences, identifying improvement priorities, devising and implementing changes (Donetto et al., 2015). Most selected papers that had patient participation were conducted in long term care services or were associated to a service improvement project.

Analysing the papers we identified reoccurring subjects that were classified in two main themes: improvements and barriers in healthcare services development or improvement and patient involvement. We then divided the themes into categories. Table 3 present these data.

Table 3: Identified themes and subthemes

Theme	Categories	ID
Improvement	Codesign and patient participation/involvement	01, 02, 12, 16, 21, 26, 29, 33, 36, 38, 39
	HCD/Service design in healthcare	02, 03, 04, 11, 13, 14, 19, 20, 25, 31, 32, 38, 40
	Service development models proposals	01, 02, 07, 08, 35, 37
	Tools to aid the design process	15, 24, 27, 28
Barriers	Organizational	05, 10, 13, 17, 18, 19
	Process	09, 10, 20, 22, 23, 28, 30, 33, 34
	Stakeholders	02, 03, 06, 10, 19, 20, 24, 29, 36

Source: the authors

### Improvements

Co-design, patient involvement, service design methods, and tools, and new proposals to service development were subjects found acting on healthcare services improvement. The co-design or co-creation aspect present in some papers has the intent to bring the users and other stakeholders to the process of shaping the service/product, transforming ordinary power relations to generate collective ownership (Bate and Robert, 2006; Donetto et al., 2015): as Bate and Robert (2007) suggest, people will support what they have helped to create. In the co-design process, the user brings a special kind of knowledge, the experience, which is the focus of the EBCD approach, designing experiences (Bate and Robert, 2006). Co-design can help organizations to create long term resources to support user value creation (Yu and Sangiorgi, 2018). In the UK, there is considerable variation in what is termed co-design in different services and sectors, and it is also practiced differently (Donetto et al., 2015). In some cases, co-design can be considered as feedback and consultation to user testing, or online collaboration and/or user research and workshops (Donetto et al., 2015).

Patients like to have their opinions heard for service quality improvement and not only for the services they use, but to all services, and they prefer to give inputs through questionnaires (Finn et al., 2018). Hearing patients and understanding their needs contribute aligning the clinical process with patients' needs and lifestyles. Consequently, patients can better manage and control their conditions outside the healthcare service (Howland and Fisher, 2015). Patients who were involved in the projects felt valued and it improved their self-esteem (Coad et al., 2008). In the mental health environment, patient involvement can be therapeutic (El Enany et al., 2013). Patient involvement in service improvement allows them to act as interpreters that bring patient experience to bear on clinical knowledge and translate clinical language into something more comprehensible to patients, resulting in communication improvements (Armstrong et al., 2013). The use of a human-centred approach with user and staff involvement in the re-design of a service can be laborious and take longer to implement, but the performance of the service is better and has better sustainability (C. J. Lin and Cheng, 2015; M. C. Lin et al., 2011).

User participation in a design process depends on the redistribution of power happening in the design decision process (Sangiorgi, 2011). This can be an issue in the healthcare scenario (as we will discuss on 4.2.2). To overcome power imbalance issues, it is proposed the use of the Nominal Group Technique (NGT) (Wainwright et al., 2014). NGT aims to reduce the power effects and encourage patients to associate their personal experiences to service design tasks and minimise the tendency of a personal narrative. The authors express the need to investigate to what extent the technique captures the voices of patients in a



legitimate, valid and reliable way. Also, on the decision-making process, examine what is the importance given to the patient voice (Wainwright et al., 2014).

Studies that used service design methods show that its use promotes the discovery of stakeholders undelivered needs, establish service concepts and goals, prototype and develop an applicable service model (Han et al., 2018). It also promoted the inclusion of important actors in different project moments and it provides a structure to guarantee that all actors' insights are taken to the created proposals (Salgado et al., 2017). The use of design ensured that the services reflect the needs of the users (patients and carers), and with their involvement, the deductions of these users' needs are reduced and improves the communication between the stakeholders (Fallon et al., 2008; Woo et al., 2011). Service staff felt more motivated and engaged due to the use of service design methods and its creative approach, the method also helped them focus on solutions instead of challenges (Eines et al., 2019).

Participative design approaches proved effective in building collaborations between service users and providers (Jun et al., 2018; Bowen et al., 2013). In the case of EB CD, the approach enables identifying improvement areas with a focus on lived experiences (Bowen et al., 2013). EB CD is a flexible approach that can be adapted to several services types and projects motivations (Borgstrom and Barclay, 2017). The use of the approach helps in making tangible what can be hard to represent in less direct and more abstract forms (Wolstenholme et al., 2010). It also helps in the construction of a sense of community and propriety in the project, which assures that lived experiences, might be the best evidence to process efficiency (Carr et al., 2011).

Using several design tools to get information from the users and other stakeholders is important to get a complete scenario of their experiences (Trischler and Scott, 2015). The use of tools such as solicited diaries on patient involvement can help capture improvement ideas from the patient context, and it can represent the patients' voice in the healthcare service. As patients may have interactions with many healthcare service providers and government agencies in their day-to-day lives, diaries can provide an understanding of how these services fit in the system and identify opportunities for service improvement (Elg et al., 2011). Customer Journey Maps can aid the identification of possible problematic touchpoints within the service and understand how users (patients) actually use the service. These maps can reinforce a user-centred focus and help staff members understand problems based on user behaviour (Marquez et al., 2015).

In the selected papers there were some models to service development proposals such as enterprise risk management that aims to reduce the risk of healthcare organizations using the method in designing new services (Remus, 2008); Glushko and Tabas (2009) proposal that considers services "front and backstage" needs and concerns; and Patrício et al. (2018) Service Design for Value model, focusing on the actors network and facilitating their interaction. Although most studies presented structured approaches and models to service development and improvement, Hjertstrom, Obstfelder e Norbye (2018) bring an example of service development facilitated by clinical and administrative knowledge and experience of nurse leaders. The experience and knowledge are expressed in the nurses' ability to negotiate and facilitate the collaboration and trust of colleagues during the development routines based on professional standards (Hjertstrom et al., 2018).

## Barriers

Barriers were divided into three categories: organisational, process and stakeholder, as was suggested by Ticehurst, Ward and Clarkson (2010). Organisational barriers included difficulties related to speed and volume of change, time available for redesign activities, and diversity of working practice (Ticehurst et al., 2010). Other authors also state time demand issues (Carr et al., 2011; Boyd et al., 2012; Hsu and McCormack, 2012). Some difficulties related to the environment were limited space (Boyd et al., 2012), and the chosen venue for user participation events, if located in a hospital setting, could be associated with treatments by the patients and evoke negative memories (El Enany et al., 2013). New services proposals can face organizational barriers, as needing to accommodate the proposal to certain conditions and characteristics such as provide specific therapies for specific conditions, being within management priorities, being affordable, among others (Wye et al., 2008).

Within process-related issues, there were problems understanding current processes, and difficulties of dealing with system complexity (Ticehurst et al., 2010). The service development process in healthcare do not fully explore what is commonly recommended to project phases in design methods; for instance, the generation phase is not about generating a wide range of options, but rather detailed plans for implementation. Currently, in most healthcare services, there is a top-down approach to service design which is not favourable to the exploration of needs and problems through stakeholder involvement (Jun et al., 2014).

In cases of community participation, there was difficulty in recruiting and maintaining the participation throughout the process (Nimegeer et al., 2016; Jun et al., 2018), the participation of stakeholders groups can be inconsistent and uneven, e. g. staff members not being able to participate in all planned events (Jun et al., 2018). Recruiting vulnerable individuals (homeless, addicts, and others) is also an issue, and it is necessary that recruiters act differently in such cases (Snow et al., 2018). Community participation in decision-making can produce messy and unpredictable outcomes, and policymakers insufficiently acknowledge this issue (Farmer and Nimegeer, 2014). In some cases, there is the perception of patient and public involvement having no real impact on decision-making (Forbat et al., 2009). In the co-creation process, there was a lack of tools to assist in group idea creation (Bowen et al., 2013; Borgstrom and Barclay, 2017).

Regarding the stakeholders, it was stated that the involvement of a senior clinician is necessary to drive the activities of redesign projects, otherwise, they probably will not happen (Ticehurst et al., 2010; Bowen et al., 2013). Finding a common agenda between the stakeholders and resistance to using design tools and techniques were also difficulties found in the implementation of design methodologies in healthcare (Ticehurst et al., 2010). There were difficulties found in the involvement of some patients, as the case of young people, who can feel anxious or vulnerable, and insecure with the power imbalance (Fallon et al., 2008). One of the biggest challenges to patient participation is time, as many patients state they would have difficulty in participating during working hours (Finn et al., 2018).

Power imbalance between staff and patients is a barrier reported in several studies (Bate and Robert, 2007; Fudge et al., 2008; El Enany et al., 2013; Wainwright et al., 2014; Donetto et al., 2015). The asymmetries of power and skill usually appear in the co-designing process and such diverse participants will invariably view the service from different, sometimes irreconcilable perspectives. The organisation-customer relationship needs to be reconfigured to take this asymmetry into account, as well as internal relationships within the

organisation (i.e. people from different levels within the organisation) (Bate and Robert, 2007). Another difficulty was the lack of impartiality in user involvement, where the selection of participants is made by staff choosing those that have the same opinion as themselves (El Enany et al., 2013), and the staff determine how the involvement is put into practice (Fudge et al., 2008; Donetto et al., 2015). The power issue complicates the co-design aspect of some models. The hierarchy allows co-design to work until a certain point, but the clinical professional profile can bring difficulties to the co-design process (Donetto et al., 2015).

#### 4. DISCUSSION AND CONCLUSION

HCD approaches to service development aim to create services that are useful, usable, effective and satisfactory to users with an emphasis on the users' needs. Considering this premise, in this paper, we investigated healthcare service development/improvement and its involvement with patient centred care through a literature review. Most of the analysed papers focused on patient participation and used HCD approaches and tools as a means to achieve it. Patient participation occurred in co-design events or workshops or gathering information via surveys. Service Design and EBCD were used to develop new services, or improve existing ones. In EBCD cases, patient participation was embed in the process as it is guided by patients, carers and staff experiences with the service. A few papers introduced other development models to healthcare services. They were more organizational centred than patient centred and did not demonstrate user involvement in the process.

Service Design, EBCD, and other patient participation initiatives were beneficial to have patient centred services. Through these approaches, patients felt valued, helped identify service problems and create solutions to it, and had a positive influence on patients care. We highlight Service Design and EBCD approaches, as they have structured methods to guide the process of service improvement or development. Service Design, in particular, can be more adequate to the development and re-design of healthcare services than other approaches as it has a more holistic view of the service system.

Although the use of the mentioned approaches brought improvements to healthcare services, there are still points that need improvement as the barriers identified show. Organizational barriers identified could be overcome with project planning and management support, as with planning management can prepare for the time, physical and human resources needed. One of the barriers related to the processes and stakeholders, in this case mainly staff, was difficulties understanding the processes and accepting new approaches to create changes. Training the stakeholders, and demonstrating how the used/proposed processes and design tools can be of value to them is fundamental to its effectiveness. Farmer and Nimegeer (2014) also point out that to create better solutions in the re-design of services with patient participation, more tools have to be included to aid creating ideas collaboratively.

Patient participation faces difficulties such as recruiting and maintaining participation. Nimegeer et al. (2016) suggest that research is needed to understand why some people participate, what are these circumstances, with what impact, and what incentives work best to entice people to contribute. Adding to Nimegeer et al. (2016) suggestion, we highlight the importance of this research also in short-stay healthcare services, as most of the current research is associated to long term care – the relationship between patients and service of

short-stay care may have an impactful difference in patient recruiting and participation. In the process of user involvement, the participation of patients with diseases of a debilitating nature may be overcome by involving articulate patients and empowering family members (Forbat et al., 2009). The main issue found in relation to patient participation was the power imbalance between patients and staff. In this case, informing the stakeholders of the importance and benefits of participation, on both sides, can be beneficial. The power issue in co-design needs service designers and researchers to look more closely and more critically at the ways in which co-design practices can and do mobilise and affect power relations amongst participants (Donetto et al., 2015).

Another issue identified is that most of the articles are from developed countries. Developing countries could also benefit from the use of people-centred approaches in service development such as the ones presented in this paper. As the cultural and economic context of these countries are different, the impact of results and the barriers of HCD approaches to service development and patient participation may be very different from the ones found here, and, therefore, need to be researched. It would also be important to investigate how these countries conduct healthcare service design and improvement and how patients participate in these processes. Furthermore, despite having found examples of models for healthcare service development, how healthcare organizations (re)design their services is not clear, and might still be unstructured or vague, they might suppress phases, focusing mainly on the concept creation. We still need research on creating appropriate models of healthcare service design that considers the service systems elements with a patient-centred approach that could be valuable to user perception of service quality and their satisfaction.

## ACKNOWLEDGMENTS

The authors would like to thank the Federal University of Santa Catarina (UFSC) and the Brazilian agencies Coordenação de Aperfeiçoamento de Pessoal de Nível Superior and National Council for Scientific and Technological Development (CNPq) for the financial support that made this research possible.

## REFERENCES

- ARMSTRONG N.; HERBERT G.; AVELING E-L.; DIXON-WOODS M.; MARTIN G. 2013. Optimizing patient involvement in quality improvement. *Health Expectations*, 16(3):e36–e47.  
DOI: [10.1111/hex.12039](https://doi.org/10.1111/hex.12039)
- BATE P.; ROBERT G. 2006. Experience-based design: from redesigning the system around the patient to co-designing services with the patient. *Quality & safety in health care*, 15(5):307–310.  
DOI: [10.1136/qshc.2005.016527](https://doi.org/10.1136/qshc.2005.016527)
- BATE P.; ROBERT G. 2007. Toward More User-Centric OD: Lessons From the Field of Experience-Based Design and a Case Study. *The Journal of Applied Behavioral Science*, 43(1):41–66.  
DOI: [10.1177/0021886306297014](https://doi.org/10.1177/0021886306297014)
- BORGSTROM E.; BARCLAY S. 2017. Experience-based design, co-design and experience-based co-design in palliative and end-of-life care. *BMJ Supportive & Palliative Care*, England, 0:1-7.  
DOI: [10.1136/bmjspcare-2016-001117](https://doi.org/10.1136/bmjspcare-2016-001117)
- BOWEN S.; MCSEVENY K.; LOCKLEY E.; WOLSTENHOLME D.; COBB M.; DEARDEN A. 2013. How was it for you? Experiences of participatory design in the UK health service. *CoDesign*, 9(4):230–246.  
DOI: [10.1080/15710882.2013.846384](https://doi.org/10.1080/15710882.2013.846384)
- BOYD H.; MCKERNON S.; MULLIN B.; OLD A. 2012. Improving healthcare through the use of co-design. *New Zealand Medical Journal*, 125(1357):76–87. Retrieved February 28, 2019, from [https://assets-global.website-files.com/5e332a62c703f653182faf47/5e332a62c703f6f7f92fde06\\_boyd.pdf](https://assets-global.website-files.com/5e332a62c703f653182faf47/5e332a62c703f6f7f92fde06_boyd.pdf)

- BRASIL.; MINISTÉRIO DA SAÚDE. 2007. PNASS Programa nacional de avaliação de serviços de saúde: resultado do processo avaliativo 2004-2006 [National evaluation program of health services: results of the evaluation process 2004-2006]. Brasília.
- BRAUN V.; CLARKE V. 2006. Using thematic analysis in psychology Using thematic analysis in psychology. *Qualitative Research in Psychology*, 377–101. DOI: [10.1191/1478088706qp0630a](https://doi.org/10.1191/1478088706qp0630a)
- CARR VL.; SANGIORGI D.; BÜSCHER M.; JUNGINGER S.; COOPER R. 2011. Integrating evidence-based design and experience-based approaches in healthcare service design. *Health Environments Research and Design Journal*, 4(4):12–33. DOI: [10.1177/2F193758671100400403](https://doi.org/10.1177/2F193758671100400403)
- COAD J.; FLAY J.; ASPINALL M.; BILVERSTONE B.; COXHEAD E.; HONES B. 2008. Evaluating the impact of involving young people in developing children's services in an acute hospital trust. *Journal of Clinical Nursing*, 17(23):3115–3122. DOI: [10.1111/j.1365-2702.2008.02634.x](https://doi.org/10.1111/j.1365-2702.2008.02634.x)
- COTTAM H.; LEADBEATER C.; DESIGN COUNCIL. 2004. Health: Co-creating Services. Red Paper. London, Design Council. Retrieved October 18, 2016, <https://www.designcouncil.org.uk/sites/default/files/asset/document/red-paper-health.pdf>
- DONETTO S.; PIERRI P.; TSIAKAKAS V.; ROBERT G. 2015. Experience-based Co-design and Healthcare Improvement: Realizing Participatory Design in the Public Sector. *The Design Journal*, 18(2):227–248. DOI: [10.2752/175630615X14212498964312](https://doi.org/10.2752/175630615X14212498964312)
- EINES TF.; ANGELO E.; VATNE S. 2019. Discourse analysis of health providers' experiences using service design. *Nursing open*, 6(1):84–92. DOI: [10.1002/nop2.191](https://doi.org/10.1002/nop2.191)
- EL ENANY N.; CURRIE G.; LOCKETT A. 2013. A paradox in healthcare service development: professionalization of service users. *Social Science & Medicine*, 8024–30. Doi: [10.1016/j.socscimed.2013.01.004](https://doi.org/10.1016/j.socscimed.2013.01.004)
- ELG M.; WITELL L.; POKSINSKA B.; ENGSTRÖM J. 2011. Solicited diaries as a means of involving patients in development of healthcare services. *International Journal of Quality and Service Sciences*, 3(2):128–145. DOI: [10.1108/17566691111146050](https://doi.org/10.1108/17566691111146050)
- FALLON S.; SMITH J.; MORGAN S.; STONER M.; AUSTIN C. 2008. 'Pizza, patients and points of view': Involving young people in the design of a post registration module entitled the adolescent with cancer. *Nurse Education in Practice*, 8(2):140–147. DOI: [10.1016/j.nepr.2007.07.005](https://doi.org/10.1016/j.nepr.2007.07.005)
- FARMER J.; NIMEGEER A. 2014. Community participation to design rural primary healthcare services. *BMC Health Services Research*, 14(1):130. DOI: [10.1186/1472-6963-14-130](https://doi.org/10.1186/1472-6963-14-130)
- FINN V.; STEPHENSON J.; ASTIN F. 2018. Patient preferences for involvement in health service development. *British Journal of Nursing*, 27(17):1004–1010. DOI: [10.12968/bjon.2018.27.17.1004](https://doi.org/10.12968/bjon.2018.27.17.1004)
- FORBAT L.; CAYLESS S.; KNIGHTING K.; CORNWELL J.; KEARNEY N. 2009. Engaging patients in health care: An empirical study of the role of engagement on attitudes and action. *Patient Education and Counseling*, 74(1):84–90. DOI: [10.1016/j.pec.2008.07.055](https://doi.org/10.1016/j.pec.2008.07.055)
- FUDGE N.; WOLFE CDA.; MCKEVITT C. 2008. Assessing the promise of user involvement in health service development: *Ethnographic study*. *BMJ*, 336(7639):313–317. DOI: [10.1136/bmj.39456.552257.BE](https://doi.org/10.1136/bmj.39456.552257.BE)
- GLUSHKO RJ.; TABAS L. 2009. Designing service systems by bridging the “front stage” and “back stage”. *Information Systems and e-Business Management*, 7(4):407–427. DOI: [10.1007/s10257-008-0106-0](https://doi.org/10.1007/s10257-008-0106-0)
- HAN N.; HAN SH.; CHU H.; KIM J.; RHEW KY.; YOON J-H.; JE NK.; RHIE SJ.; JI E.; LEE E.; and co-authors. 2018. Service design oriented multidisciplinary collaborative team care service model development for resolving drug related problems. *PLOS ONE*, 13(9):e0201705. DOI: [10.1371/journal.pone.0201705](https://doi.org/10.1371/journal.pone.0201705)
- HJERTSTROM HK.; OBSTFELDER A.; NORBYE B. 2018. Making New Health Services Work: Nurse Leaders as Facilitators of Service Development in Rural Emergency Services. *Healthcare*, 6(4):1–13. DOI: [10.3390/healthcare6040128](https://doi.org/10.3390/healthcare6040128)
- HOWLAND S.; FISHER K. 2015. Looking through the patient lens – Improving best practice for young people with juvenile idiopathic arthritis transitioning into adult care. *SpringerPlus*, 4(1):111. DOI: [10.1186/s40064-015-0888-8](https://doi.org/10.1186/s40064-015-0888-8)
- HSU MY.; MCCORMACK B. 2012. Using narrative inquiry with older people to inform practice and service developments. *Journal of Clinical Nursing*, 21(5–6):841–849. DOI: [10.1111/j.1365-2702.2011.03851.x](https://doi.org/10.1111/j.1365-2702.2011.03851.x)
- ISO ISO. 2010. Ergonomics of human-system interaction - Part 210: Human-centred design for interactive systems: ISO 9241-210. Switzerland. Retrieved July 13, 2017, from <https://www.abntcatalogo.com.br/norma.aspx?ID=419228>
- JUN GT.; CANHAM A.; ALTUNA-PALACIOS A.; WARD JR.; BHAMRA R.; ROGERS S.; DUTT A.; SHAH P. 2018. A participatory systems approach to design for safer integrated medicine management. *Ergonomics*, 61(1):48–68. DOI: [10.1080/00140139.2017.1329939](https://doi.org/10.1080/00140139.2017.1329939)



- JUN GT.; MORRISON C.; CLARKSON PJ. 2014. Articulating current service development practices: A qualitative analysis of eleven mental health projects. *BMC Health Services Research*, 14. DOI: [10.1186/1472-6963-14-20](https://doi.org/10.1186/1472-6963-14-20)
- KEINONEN T. 2010. Protect and appreciate - Notes on the justification of user-centered design. *International Journal of Design*, 4(1):17–27. Retrieved March 13, 2016, from <http://www.ijdesign.org/index.php/IJDesign/article/view/561/280>
- KELLY D.; STOREY C. 2000. New service development: initiation strategies. *International Journal of Service Industry Management*, 11(1):45–63. DOI: [10.1108/09564230010310286](https://doi.org/10.1108/09564230010310286)
- LIN CJ.; CHENG L-Y. 2015. An integrated model of service experience design improvement. *The Service Industries Journal*, 35(1–2, SI):62–80. DOI: [10.1080/02642069.2014.979407](https://doi.org/10.1080/02642069.2014.979407)
- LIN MC.; HUGHES BL.; KATICA MK.; DINING-ZUBER C.; PLSEK PE. 2011. Service Design and Change of Systems: Human-Centered Approaches to Implementing and Spreading Service Design. *International journal of design*, 5(2):73–86. Retrieved February 28, 2019, from <http://www.ijdesign.org/index.php/IJDesign/article/view/928/348>
- MAGUIRE M. 2001. Methods to support human-centred design. *International Journal of Human Computer Studies*, 55(4):587–634. DOI: [10.1006/ijhc.2001.0503](https://doi.org/10.1006/ijhc.2001.0503)
- MARQUEZ JJ.; DOWNEY A.; CLEMENT R. 2015. Walking a Mile in the User's Shoes: Customer Journey Mapping as a Method to Understanding the User Experience. *Internet Reference Services Quarterly*, 20(3–4):135–150. DOI: [10.1080/10875301.2015.1107000](https://doi.org/10.1080/10875301.2015.1107000)
- MORITZ S. 2005. *Service Design: Practical Access to an Evolving Field*. London, KISD.
- NIMEGEER A.; FARMER J.; MUNOZ SA.; CURRIE M. 2016. Community participation for rural healthcare design: description and critique of a method. *Health & Social Care in the Community*, 24(2):175–183. DOI: [h10.1111/hsc.12196](https://doi.org/10.1111/hsc.12196)
- NORMAN DA. 2002. *The Design of Everyday Things*. New York: Basic Books..
- OCLOO J.; MATTHEWS R. 2016. From tokenism to empowerment: Progressing patient and public involvement in healthcare improvement. *BMJ Quality and Safety*, 25(8):626–632. DOI: [10.1136/bmjqs-2015-004839](https://doi.org/10.1136/bmjqs-2015-004839)
- PATRÍCIO L.; PINHO NF De.; TEIXEIRA JG.; FISK RP. 2018. Service Design for Value Networks: Enabling Value Cocreation Interactions in Healthcare. *Service Science*, 10(1):76–97. DOI: [10.1287/serv.2017.0201](https://doi.org/10.1287/serv.2017.0201)
- PLSEK PE. 1997. Systematic design of healthcare processes. *Quality in Health Care*, 640–48. DOI: [10.1136/qshc.6.1.40](https://doi.org/10.1136/qshc.6.1.40)
- REMUS B. 2008. Addressing risk in the design of new healthcare services: a step-by-step methodology. *Journal of Healthcare Risk Management*, 28(1):31–36. DOI: [10.1002/jhrm.5600280106](https://doi.org/10.1002/jhrm.5600280106)
- RUBIN J.; CHISNELL D. 2008. *Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests*. 2nd edition. Indianapolis, Wiley publishing. 348 p.
- RUSS LR.; PHILLIPS J.; BRZOZOWICZ K.; CHAFETZ LA.; PLSEK PE.; BLACKMORE CC.; KAPLAN GS. 2013. Experience-based design for integrating the patient care experience into healthcare improvement: Identifying a set of reliable emotion words. *Healthcare*, 1(3–4):91–99. DOI: [10.1016/j.hidsi.2013.07.004](https://doi.org/10.1016/j.hidsi.2013.07.004)
- SALGADO M.; WENDLAND M.; RODRIGUEZ D.; BOHREN MA.; OLADAPO OT.; OJELADE OA.; OLALERE AA.; LUWANGULA R.; MUGERWA K.; FAWOLE B. 2017. Using a service design model to develop the 'Passport to Safer Birth' in Nigeria and Uganda. *International journal of gynaecology and obstetrics*, 139(1):56–66..DOI: [10.1002/ijgo.12381](https://doi.org/10.1002/ijgo.12381)
- SANGIORGI D. 2011. Transformative services and transformation design. *International Journal of Design*, 5(2):29–40. Retrieved September 14, 2018, from <http://www.ijdesign.org/index.php/IJDesign/article/view/940/344>
- SCHEUING EE.; JOHNSON EM. 1989. A Proposed Model for New Service Development. *Journal of Services Marketing*, 3(2):25–34. DOI: [10.1108/EUM0000000002484](https://doi.org/10.1108/EUM0000000002484)
- SNOW EM.; TWEEDIE K.; PEDERSON A. 2018. Heard and valued: The development of a model to meaningfully engage marginalized populations in health services planning. *BMC Health Services Research*, 18(1):1–13. DOI: [10.1186/s12913-018-2969-1](https://doi.org/10.1186/s12913-018-2969-1)
- STEEN M.; MANSCHOT M.; DE KONING N. 2011. Benefits of Co-design in Service Design Projects. *International Journal of Design*, 5(2):53–60. Retrieved September 14, 2018, from <http://www.ijdesign.org/index.php/IJDesign/article/view/890/346>
- STEWART M.; BROWN JB.; DONNER A.; MCWHINNEY IR.; OATES J.; WESTON WW.; JORDAN J. 2000. The Impact of Patient-Centered Care on Outcomes. *The Journal of Family Practice*, 49(9):796–805. Retrieved June 11, 2019, from <https://pubmed.ncbi.nlm.nih.gov/11032203/>
- STICKDORN M.; SCHNEIDER J. 2010. *This is Service Design Thinking: Basics, Tools, Cases*. Amsterdam, BIS Publishers.



- TECHNOLOGY STRATEGY BOARD.; DESIGN COUNCIL. 2014. Design methods for developing services : an introduction to service design and a selection of service design tools Retrieved August 23,2014, from, [http://www.designcouncil.org.uk/sites/default/files/asset/document/Design\\_methods\\_for\\_developing\\_services.pdf](http://www.designcouncil.org.uk/sites/default/files/asset/document/Design_methods_for_developing_services.pdf).
- TICEHURST A.; WARD J.; CLARKSON J. 2010. Barriers to Design in Healthcare. *Australasian Medical Journal, Australasian Medical Journal*, 3(9):570–579. DOI: [10.4066/AMJ.2010.463](https://doi.org/10.4066/AMJ.2010.463)
- TRISCHLER J.; SCOTT DR. 2015. Designing Public Services: The usefulness of three service design methods for identifying user experiences. *Public Management Review*, 18(5):718–739. DOI: [10.1080/14719037.2015.1028017](https://doi.org/10.1080/14719037.2015.1028017)
- UXPA UEPA. 2014. Definitions of User Experience and Usability. Retrieved June 12, 2019. from <https://uxpa.org/resources/definitions-user-experience-and-usability>.
- WAINWRIGHT D.; BOICHAT C.; MCCracken LM. 2014. Using the nominal group technique to engage people with chronic pain in health service development. *The International Journal of Health Planning and Management*, 29(1):52–69. DOI: [/10.1002/hpm.2163](https://doi.org/10.1002/hpm.2163)
- WOLSTENHOLME D.; COBB M.; BOWEN S.; WRIGHT P.; DEARDEN A. 2010. Design-led service improvement for older people. *Australasian Medical Journal*, 3(8):465–470. DOI: [10.4066/AMJ.2010.377](https://doi.org/10.4066/AMJ.2010.377)
- WOO J.; MAK B.; CHENG JO.; CHOY E. 2011. Identifying service needs from the users and service providers' perspective: A focus group study of Chinese elders, health and social care professionals. *Journal of Clinical Nursing*, 20(23–24):3463–3471. DOI: [10.1111/j.1365-2702.2011.03702.x](https://doi.org/10.1111/j.1365-2702.2011.03702.x)
- WORLD HEALTH ORGANIZATION. 2010. Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and their Measurement Strategies. Geneva, WHO Document Production Services. 1–92 p. Retrieved July 6, 2010, from [https://www.who.int/healthinfo/systems/WHO\\_MBHSS\\_2010\\_full\\_web.pdf](https://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf)
- WYE L.; SHAW A.; SHARP D. 2008. Designing a 'NHS friendly' complementary therapy service: A qualitative case study. *BMC Health Services Research*, 8(1):173. DOI: [/10.1186/1472-6963-8-173](https://doi.org/10.1186/1472-6963-8-173)
- YU E.; SANGIORGI D. 2018. Service Design as an Approach to Implement the Value Cocreation Perspective in New Service Development. *Journal of Service Research*, SAGE Publications Inc., 21(1):40–58. DOI: [/10.1177/2F1094670517709356](https://doi.org/10.1177/2F1094670517709356)