ITU A|Z • Vol 21 No 2 • July 2024 • 431-451

Creating a journey map canvas for healthcare service design: Cesarean section as an example

Hatice Kübra YILDIZ[1]*, Gülname TURAN[2]
[1] dolaph@itu.edu.tr • Department of Industrial Design, Faculty of Architecture, Istanbul Technical University, Istanbul, Turkey
[2] gulname@itu.edu.tr • Department of Industrial Design, Faculty of Architecture, Istanbul Technical University, Istanbul, Turkey

*Corresponding author
Received: August 2023 • Final Acceptance: March 2024

Abstract
Designing effective healthcare services can be challenging due to the multi-component nature of the healthcare context. Therefore, designers and design researchers in the healthcare field use various methods and tools to create solutions for healthcare services. Accordingly, the journey mapping method has a wide range of potential, from identifying gaps in care to understanding the needs of healthcare recipients and is increasingly being used to provide a holistic view of the care service delivery. However, there are few studies documenting the method, and the lack of standardization in its use leads to confusion. This article presents a journey map canvas to provide an overview of healthcare delivery. The study demonstrates how to create and use a journey map canvas through a case study of cesarean section under regional anesthesia, using a mixed-methods approach that integrates online narratives and semi-structured interviews. The canvas aims to aid designers, design researchers, and healthcare professionals in analyzing and improving a healthcare recipient's experience. It provides the necessary knowledge and understanding, although it only represents a comprehensive analysis of the case study's service delivery and may be applicable in other contexts.

Keywords
Care journey, Design tools, Healthcare services, Journey mapping, Service design.

doi: 10.58278/0.2024.49

1. Introduction

In recent years, medical care has been replaced by a new paradigm known as 'health care' with the significant changes in the health sector. The focus of health care has shifted from the patient and the disease to the experience of the healthcare recipient (Moeke & van Andel, 2017), with an emphasis on improving their quality of life and involving them in the care process (Ekman et al., 2011). This shift towards a broader role of design in the health sector has significantly impacted on the relationship between professionals and healthcare (Groeneveld et al., 2018). Design is no longer limited to the development of medical devices, but also encompasses the delivery of healthcare services, enabling it to influence the future of healthcare practice (Partridge, 2017).

However, designing effective healthcare services can be challenging due to the complex nature of the healthcare context (Lee, 2017). This is because designing healthcare spaces must accommodate diverse users with changing needs, while also ensuring efficiency and safety (Price & Lu, 2012). Furthermore, conducting design research in healthcare settings has various challenges and obstacles for design researchers. Challenges in healthcare design research include managing relationships with stakeholders and dealing with sensitive situations (Groeneveld et al., 2018). To address these challenges, designers and researchers are developing and using new strategies and methods (Tsekleves & Cooper, 2017). The use of journey mapping in healthcare design research is on the rise and appears to be a promising method. The journey map allows researchers to gain insight into the experience of the main actor from an in-depth perspective, creating a shared understanding among all actors. However, despite the increasing use of this tool, there are relatively few studies in the literature documenting its effectiveness (Simonse et al., 2019), and there is no standardization for its use. Regarding this gap, this paper focuses on the creation and the use of a journey map canvas for healthcare services, via a case of cesarean section under regional anesthesia [1].

Cesarean section is a surgical procedure involving incisions in the mother's abdomen and uterus to deliver the baby when vaginal delivery is not safe for the mother and baby (breech presentation, labor dystocia, multiple gestations, health conditions such as preeclampsia, etc.) (Asiyanbola et al., 2022; Sung & Mahdy, 2024). There is growing evidence that women who give birth by cesarean section have a less satisfying birth experience than those who give birth vaginally (Smith et al., 2008). This is because the protocols for neonatal care and mother-infant interaction in cesarean births are different from those in vaginal births (Mercier & Durante, 2018), involving a techno-medical process that includes a preoperative phase in which the mother is prepared for surgery, an intraoperative phase in which the surgery is performed, and a postoperative phase that includes the mother's medical care after delivery (Dahlke et al., 2013; Kaye et al., 2018). In this context, the need to mitigate this approach brought about by machines and interventions in childbirth is highlighted (Capogna & de Boer, 2017; Davis-Floyd, 2001), and improving this healthcare experience is one of the main goals of professionals within the mother-friendly design approach. Accordingly, this case study provides a comprehensive example of how to handle healthcare processes while enabling designers and design researchers to identify areas for improvement. By taking a holistic approach, from wearing the surgical gown to postpartum care, the emphasis on surgical rituals can be reduced. The journey map helps to identify the wide range of processes involved, including the transfer process to the operating theatre and experiences in the operating theatre environment. In addition, this case was chosen to highlight that healthcare services are not only focused on patients, but also on vulnerable populations such as women giving birth. The case of cesarean section was preferred over vaginal delivery because it has a more standardized process, referred to as a care pathway in this paper.

The proposed journey map canvas aims to provide designers and design

researchers with a holistic perspective on healthcare service delivery. It allows for the evaluation of relevant experiences and identification of gaps in the care process. The proposed method can also be used to map the experiences of actors involved in the care pathway, other than the healthcare recipient. This can lead to a more comprehensive compilation of data that affects the healthcare recipient. Additionally, this study proposes alternative uses for the canvas beyond the creation of a journey map. Section 2 explains the theoretical background on healthcare service design and journey maps. Section 3 presents the methodology of the study, which was carried out with an inductive approach. Section 4 presents, the creation of a journey map canvas for healthcare services through a case study, along with evaluations on the representativeness of the proposed tool and suggestions for its use. The studies are followed by a discussion section.

2. Theoretical background

This section provides a concise introduction to healthcare service design to support the theoretical background of the research. It then discusses the role of the journey mapping method in healthcare services. Throughout this section, the term 'healthcare recipient' is used instead of 'patient', to encompass the wider group of individuals who receive healthcare services and represent multi-layered identities including patients, persons and customers (Moeke & van Andel, 2017).

2.1. An overview of healthcare service design

Service design is a person-centered approach that focuses on the behavior of real people in the context in which service delivery, with the aim of creating and improving services (Marquez & Downey, 2015). Healthcare service design is a part of a broader concept that addresses the process of care delivery and the experience of the healthcare recipient. There is a considerable amount of evidence to suggest that an effective service design approach has many benefits (Lee, 2019). The process of healthcare service design involves multiple actors, including healthcare recipients and care providers, and provides various perspectives on how the experience is shaped throughout the care journey via touchpoints (Sweeney et al., 2015). It also aids in identifying existing issues to improve pathways and deliver new services (Simonse et al., 2019).

All care activities provided in healthcare services occur during service encounters or touchpoints. During these encounters, healthcare recipients interact with various actors, particularly healthcare professionals, resulting in a unique experience for each recipient. Therefore, healthcare service design should focus on improving healthcare recipient experiences while considering performance improvement and related constraints, as one of its main goals (McCarthy et al., 2016). When designing a healthcare process, it is revealed that the experiences of people about the service they benefit from should be considered as a whole, taking into account all possible care activities and contact points (Lee, 2019). This is because care providers who actively listen to healthcare recipients and involve them in the decision-making process have been found to have higher satisfaction scores (Philpot et al., 2019). For this reason, healthcare providers are now seeking more effective ways to deliver care (Andreassen et al., 2016). The healthcare sector has seen a shift towards a person-centered perspective (Price, 2006; Tsekleves & Cooper, 2017) resulting in an increased interest in user-centered design approaches and a desire to greater collaboration with designers (Simonse et al., 2019; Wildevuur, 2017).

However, healthcare organizations' willingness to collaborate with designers is limited by differences in approaches and cultures (Reay et al., 2017). Designing effective care services in the complex nature of the healthcare context is often challenging due to ethical issues, fieldwork, involving end-users, working with vulnerable groups, and time and financial constraints (Groeneveld et al., 2018; Lee, 2017). Accordingly, service design tools and methods can help address these challenges and provide guid-

ance on healthcare service experiences. Journey maps are one such tool used in this context.

2.2. Journey mapping method in healthcare services

Journey maps are defined as *"a visualization of the process a person goes through to accomplish a goal"* (Gibbons, 2018). They typically represent the experience of a main actor (Alves, 2022), and can take various formats depending on the context of use (Howard, 2014). These maps usually involve creating a visual narrative that depicts the multidimensional relationship between a person and a service along a time axis (Ly et al., 2021). Although journey mapping is commonly used method in service design (Marquez et al., 2015), its use in the healthcare context is relatively new (Philpot et al., 2019) and is increasingly being adopted (Sijm-Eeken et al., 2020). This method, commonly referred to as 'patient journey mapping' in the literature (Davies et al., 2023), visually represents all the stages an individual goes through in the process of receiving care and their experiences during these stages (Sijm-Eeken et al., 2020). The resulting visual tool captures both the physical and emotional journey including people's behaviors, emotions, motivations and attitudes throughout the care journey (McCarthy et al., 2016). It enables the visualization of the care journey on a large scale, from pre-service to post-service (Cramer, 2022).

Journey mapping is an advantageous and beneficiary tool in healthcare service design and healthcare encounters (Davies et al., 2023; Ly et al., 2021). It can increase healthcare recipient satisfaction, demonstrate positive health outcomes (Joseph et al., 2020) and improve operational efficiency (Rainer, 2022b). This visual tool provides valuable insight into a healthcare services (Simonse et al., 2019) and helps to identify gaps, barriers and opportunities for improvement in care delivery (Ly et al., 2021). It promotes a holistic understanding of care (Ly et al., 2021) by considering the whole picture (Rawson et al., 2013) rather than focusing on individual touchpoints. Compared to traditional research methods, it offers a more comprehensive approach. Visualization creates a common language between multidisciplinary stakeholders (Gibbons, 2018) and enables the creation of shared insights (Simonse et al., 2019). Unlike tools that do not involve active mapping of care stages, such as personas and storyboards (Madathil et al., 2020), it provides a more dynamic and multidimensional perspective (Howard, 2014). Additionally, maps created from the perspective of healthcare recipients can empower them to improve the care process and help care providers to be better informed (Joseph et al., 2020). This can enhance communication between healthcare recipients and care providers (Ly et al., 2021) leading to increased empathy (Joseph et al., 2020; McCarthy et al., 2016). These maps aid in understanding the current situation and are also used to plan future processes (Maddox et al., 2019).

Despite the advantages outlined above, journey maps have some limitations. Designing comprehensive and accessible journey maps can be challenging (McCarthy et al., 2016), particularly due to the complexity of health services and the high number of interdependencies (Maddox et al., 2019; Rosenbaum et al., 2017). It is important to avoid including all information in journey maps as this can result in a data-rich but crowded map. This can result in poor readability, especially when used as a communication tool between different stakeholders (Maddox et al., 2019). The use of journey maps in healthcare is relatively new, which has led to a lack of standardization in the method. There is considerable variation in the type of diagram and no consistent methodology (Joseph et al., 2020; Kaplan, 2017; Madathil et al., 2020; Maddox et al., 2019; Sijm-Eeken et al., 2020). While there is some guidance in the user experience field creating journey maps, the unique nature of healthcare environments makes it challenging to follow existing guidance (Maddox et al., 2019). According to Ly et al. (2021) the simplified approach in existing journey mapping tools is unsuitable for communicating complex information and is not designed for

healthcare. Therefore, there is a lack of understanding on how to map and visualize an experience. Even when the method is used, it is relatively poorly documented (Simonse et al., 2019); and reported inconsistently (Sijm-Eeken et al., 2020).

Due to the limitations outlined, journey mapping has low adoption rates and is an underused tool in the healthcare sector, despite its potential to identify gaps in healthcare delivery (Joseph et al., 2020). Additionally, there is still confusion surrounding the best practices for creating a journey map (Rosenbaum et al., 2017). Therefore, there is a need to review, evaluate and disseminate of knowledge and implementation strategies for journey mapping in healthcare (Madathil et al., 2020). The studies in this article aim to meet these needs and contribute to filling the gap in the literature.

3. Methodology

Ethical issues and lack of experience and knowledge in the healthcare field are common challenges encountered in healthcare research. In such cases, designers and design researchers typically employ various research methods to gain a deeper understanding healthcare recipients and address their needs with a greater insight (Davies et al., 2023; Joseph et al., 2020; Madathil et al., 2020; Maddox et al., 2019). A review of the literature shows that the journey mapping method has been used in health services with studies employing qualitative, quantitative and mixed methods (Davies et al., 2023) including observations, questionnaires and semi-structured interviews, particularly in the mapping process. This article explains how to create and use a journey map canvas for healthcare services through an inductive case study entailing a mixed research method. Simonse et al. (2019) suggests that the most appropriate method for revealing journey mapping method is through an inductive case study.

Accordingly, this study, was conducted in two phases, investigating the case of cesarean section under regional anesthesia. A mixed research method was employed, using online narratives and semi-structured interviews. This was due to the critical importance of privacy and hygiene factors in childbirth (Figure 1):

- Phase 1 - Creating a journey map: Online narratives about women's birth stories on various archives of online platforms were compiled. Thematic analysis of these narratives was carried out to identify the basic components of a journey map canvas and a draft of a journey map canvas was created.

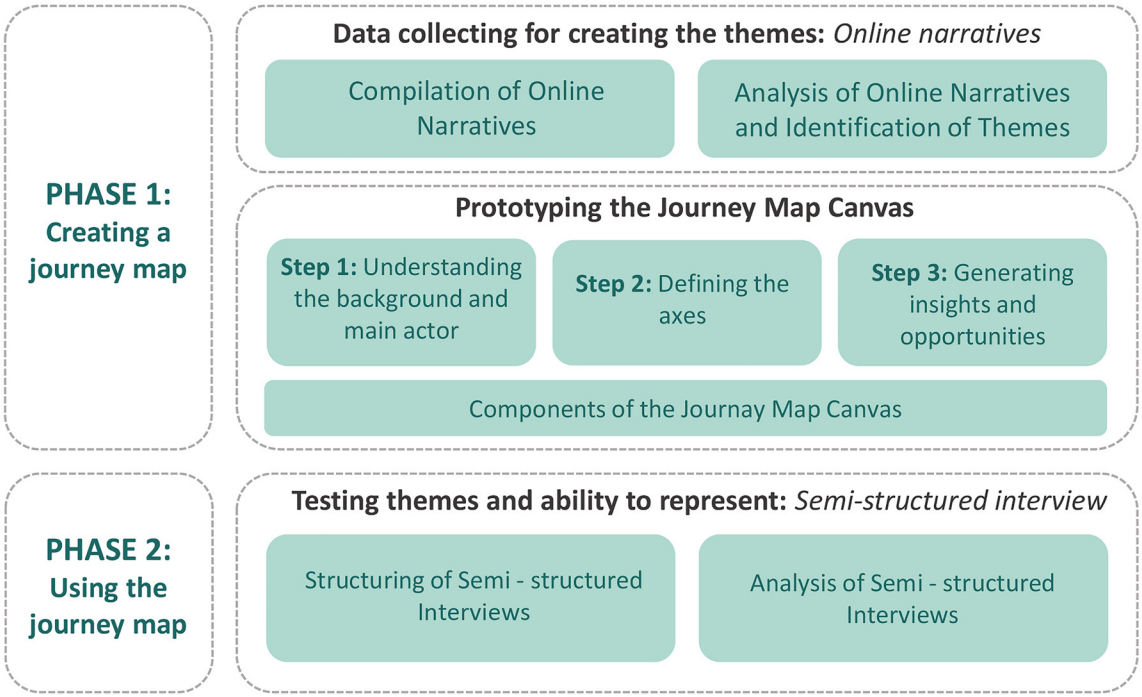

Figure 1. *Structure of the article.*

- Phase 2 - Using the journey map: A set of questions was prepared and semi-structured interviews were conducted with women who had cesarean section under regional anesthesia. Afterwards, the thematic analysis of the interviews was then carried out to review the themes of the journey map canvas, the representation ability of the map was evaluated and suggestions were made on how it could be used.

4. A journey map canvas for healthcare service design

4.1. Phase 1: Creating a journey map

The objective of this section is to develop a journey map canvas for healthcare services. To achieve this, a thematic analysis of the online narratives was conducted to identify the components of the journey map. Subsequently, a journey map canvas was prototyped based on the themes extracted from the online narratives.

4.1.1. Data collecting for creating the themes: Online narratives

The sources of information available to design researchers have changed with the advent of digital technologies (Hine, 2000; Markham, 1998). Virtual communication environments, such as various websites, discussion forums, blogs and social networking platforms, provides a good 'research area' for obtaining information about individuals or communities. This is particularly useful in situations where observations in confidential areas, such as health environments, is difficult (Hine, 2011).

Virtual platforms provide a large pool of data for analyzing birth cases. The analysis of birth stories shared on various forum sites or social sharing platforms such as YouTube and Vimeo, indicates that mothers are highly motivated to share their birth experiences. Therefore, due to the presence of women in virtual environments (Pandey et al., 2003), online platforms were selected as the research area for this healthcare service study.

Compilation of online narratives

First, a preliminary digital archive search was conducted for birth stories about cesarean section under regional anesthesia by scanning various online documents (personal blogs, websites, forums, social platforms, etc.) for the case study. This preliminary study includes written and oral sources. After a preliminary search of digital archives, thirty (30) of the most comprehensive and diverse online narratives (birth stories) were selected for in-depth exploration (Table 1), taking into account the person limit required for causal research as put by Gay (1987). This selection creating a representative group was utilized in constructing the overall structure and components of the journey map by exploring the points that the women find worth sharing, how they communicated their experiences and how they structured their narratives.

Regarding the reliability of the research, the evaluated birth stories were selected from blogs with open authors and audiovisual YouTube videos where the narrator is visible. Therefore, four-

Table 1. *Grouping of online narratives.*

Groups by Birth Type	Online Narratives	Text Based	Audiovisual Based	Total
Planned Cesarean	N1, N2, N3, N4, N5, N6 **N7, N8, N9, N10, N11, N12, N13, N14, N15**	6	**9**	15
Unplanned Cesarean	N16, N17, N18, N19, N20, N21, N22, N23 **N24, N25, N26, N27, N28, N29, N30**	8	**7**	15

teen (14) of the selected birth stories were text-based, while sixteen (16) were audiovisual (Table 1). To comply with ethical conditions and maintain confidentiality, each narrator was coded as N1, N2, etc. In addition, the birth stories selected for analysis were divided into two groups: 'planned cesarean section' and 'unplanned cesarean section', based on the type of delivery. This decision was made because there are differences in the care pathways for these types of cesareans (National Childbirth Trust, 2022):

- Planned cesarean section is a type of cesarean section performed on a scheduled date, by the mother's choice or by the decision of a healthcare professional (National Health Service, 2019).
- Unplanned cesarean section is a type of cesarean section that is performed when labor is not progressing normally, or when labor should start earlier than expected (National Institute of Health and Clinical Excellence, 2021).

Analysis of online narratives and identification of themes

The birth stories were separated into the identified groups and then analyzed thematically using MAXQDA 2022 (VERBI Software, 2021), a qualitative and mixed methods data analysis software. Relevant themes were identified and categorized iteratively. MAXQDA's Code Matrix Browser was used to visually display the themes extracted from each online narrative (Figure 2).

The ten (10) themes identified as the basic components of the journey map canvas were structured into 3 phases as 'Before Service, During Service and After Service':

- Before Service:

  Background: This includes the background activities that have an impact on the assessment of the whole birth experience.

  Obstacles: It covers the difficulties that women face in the prenatal process.

  Goals and Expectations: It includes findings on what kind of birth experience women dream of having and what they expect from birth.

  Preferences: It includes the factors affecting women's preferences for the type of delivery and their preferences for the choice of doctor and hospital.

  Motivations: This includes the activities that make up a good birth experience.

  Fears: It covers women's fears about the birth process.

  Attitudes: This includes women's tendencies towards different situations they experience during pregnancy.

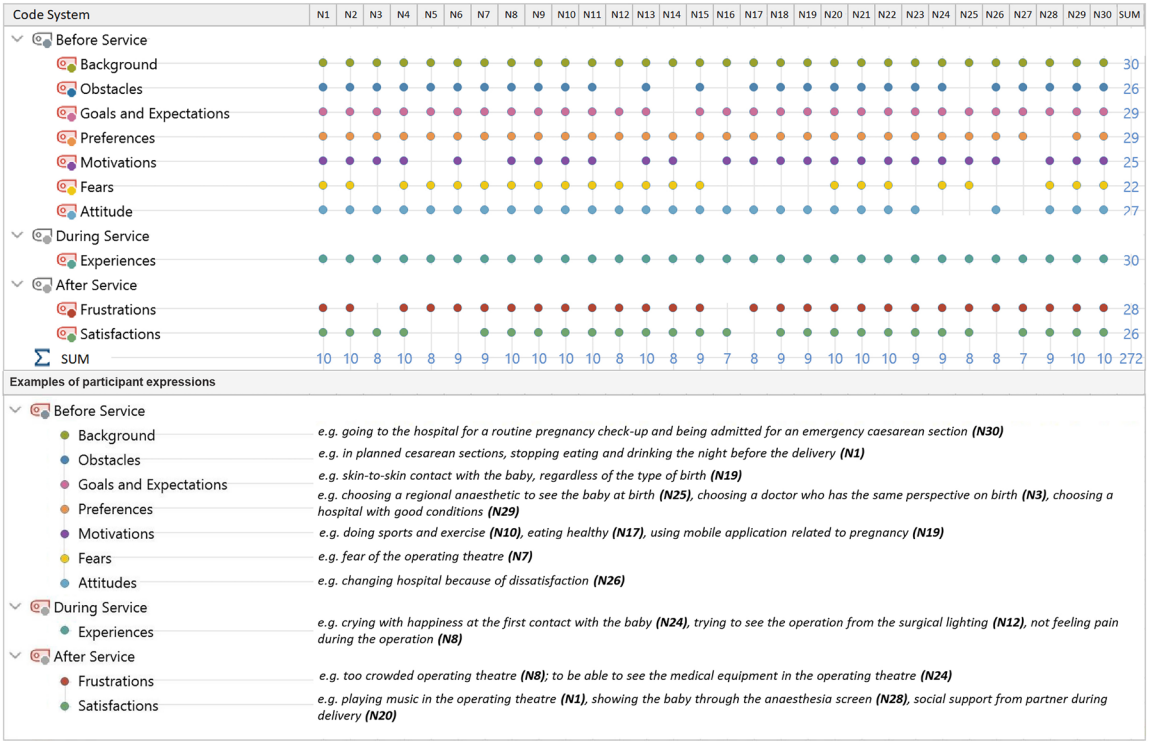

Figure 2. *Distribution of themes according to online narratives [2] (MAXQDA, 2022).*

- During Service:
  Experiences: It covers the stages of women's care journey, their feelings, thoughts and behaviors during this process and the physical experiences they have.
- After Service:
  Frustrations: This covers the frustrations experienced by women during the service period.
  Satisfactions: This covers the satisfactions experienced by women during the service period.

The identified components were used to prototype a journey map canvas was by organizing these components according to the journey map ontology.

4.1.2. Prototyping the journey map canvas

According to Kaplan (2016a), although journey maps vary depending on the context in which they are used, they typically have an ontology consisting of three zones: a lens that provides focus and context for the map (Zone A), an area that shows the person's experience (Zone B), and insights gained from analyzing the journey (Zone C). Based on this ontology, the themes from the online narratives were organized and a journey map canvas for healthcare service design in 3 steps was created (Figure 3):

- Zone A: Understanding the background and main actor
- Zone B: Developing the axis
- Zone C: Generating insights and opportunities

Step 1: Understanding the background and main actor

Zone A, which provides constraints for the person being mapped and the scenario to be analyzed (Kaplan, 2016a), is focused on understanding the main actor and the background of the experience. The components in this zone are related to the themes of *'Background, Obstacles, Goals and Expectations, Preferences, Attitudes, Motivations, Fears'* which will help to understand the background situation and the main actor in the process before the service. The 'main actor', which is the person experiencing the journey (Gibbons, 2018; Kaplan, 2016a; Rainer, 2022a), corresponds to the 'service recipient' who benefits from the service in a study on the healthcare context. In these maps, which can be created for a real person, the main actor can also be created for fictional characters (persona) with similar behaviors and needs (Cramer, 2022; Rainer, 2022a).

Step 2: Developing the axes

Zone B, the center of the map, is the part where the actual journey is described (Marquez et al., 2015). In general, it consists of a horizontal time axis and a vertical axis containing the elements mapped along the time axis (Howard, 2014). The horizontal axis

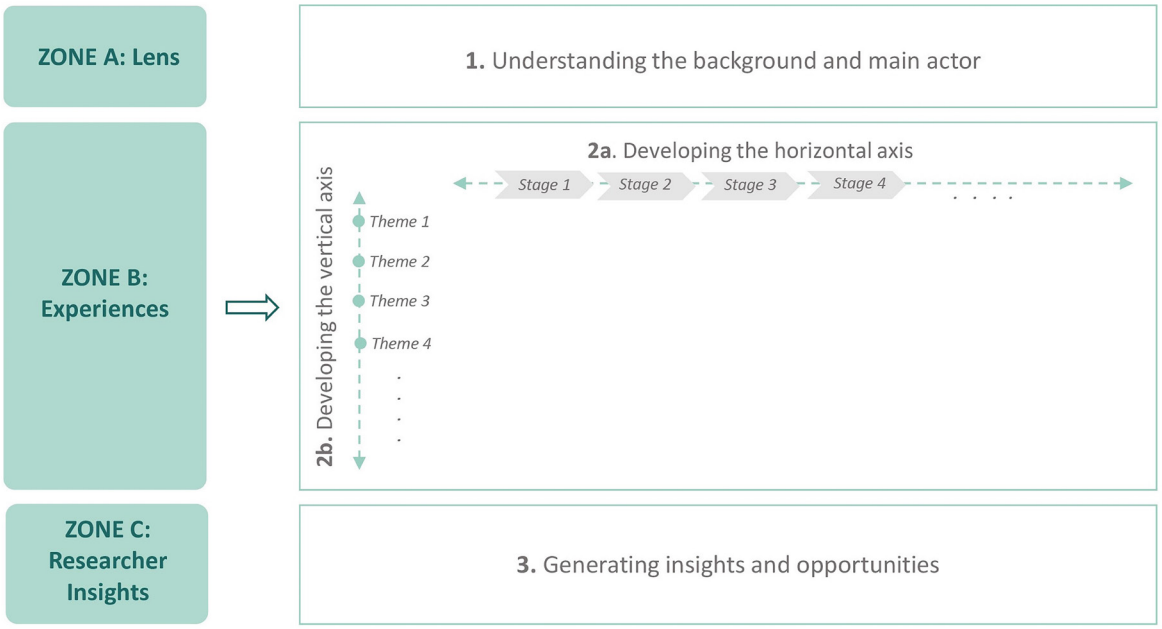

Figure 3. *Journey map ontology.*

contains the stages and sub-stages that will allow data to be ordered and structured along a timeline (Cramer, 2022). The elements of the vertical axis vary depending on the intended use and design goal of the journey map; but essentially include the actions, thoughts and feelings of the main actor throughout the journey stages (Gibbons, 2017; Howard 2014). These elements, associated with the theme of 'experiences' from online narratives, form the first components of the healthcare journey map canvas on the vertical axis.

Second, it is stated that instead of designing for isolated problems in a complex system such as healthcare, all actors involved in the problem should be involved in the design process (Goossens, 2017a). This is because the interaction of actors with the care journey enables the identification of potential touchpoints in the context of the relevant healthcare service (Goossens, 2017b). The redesign of these touchpoints plays an important role in the improvement of the relevant healthcare service (Simonse et al., 2019). In this context, *'human actors'* and *'non-human actors'*, which can be a person, product or service that can actively contribute to the care process, constitute the other components on the vertical axis of the healthcare journey map canvas to identify opportunities for idea generation.

Finally, the vertical axis in a care journey can be used to identify pain points where the needs of the main actor are not being met (Kalbach, 2016), and to identify gain points where the experience can be improved (Pell, 2022). These points, linked to moments of interaction with both human and non-human actors, can help designers generate insights that can lead to new opportunities. Accordingly, the final components of the journey map canvas on the vertical axis are the themes of *'satisfaction'* and *'frustration'* derived from the online narratives associated with this approach.

Step 3: Generating insights and opportunities

Zone C, which is divided into identifying opportunities to generate ideas for innovations, products or services, includes researcher insights (Kaplan, 2016a). While the insights come from a comprehensive synthesis of all content (Marquez et al., 2015), the opportunities identified based on the insights reveal how the experience can be optimized. This helps the researcher to extract information from the map (Gibbons, 2018). Although this zone is crucial for communicating findings, it is reported to be the least included in journey maps (Kaplan, 2016b). However, Kaplan (2016b), who emphasizes the importance of developing insights to optimize experiences, states that it is not possible to turn a journey map into an action plan without defining Zone C and that the effectiveness of a journey map is significantly weakened if it is simplified to the exclusion of this area. In this context, the components in the last part of the journey map canvas have been identified as *'Insights* and *Opportunities'* in order to evaluate the data obtained and turn it into an action plan.

Component of the journey map canvas

After identifying the components, a journey map canvas was prototyped by organizing them according to the journey map ontology (Figure 4). The canvas includes sections for the main actor (A) and the main actor's experience (B) which are divided into three phases: 'Before Service, During Service, After Service':

- Before Service: Data is collected on the background and obstacles to the relevant experience, as well as data on the main actor's goals and expectations, preferences, motivations, fears and attitudes (A) towards the healthcare service.
- During Service: Data is collected on the main actor's feelings, thoughts and actions towards the relevant healthcare service (B.1), as well as data on the activities of other relevant actors (B.2).
- After Service: Data is collected on frustration and satisfaction (B.3), which includes the main actor's evaluation of the healthcare experience.

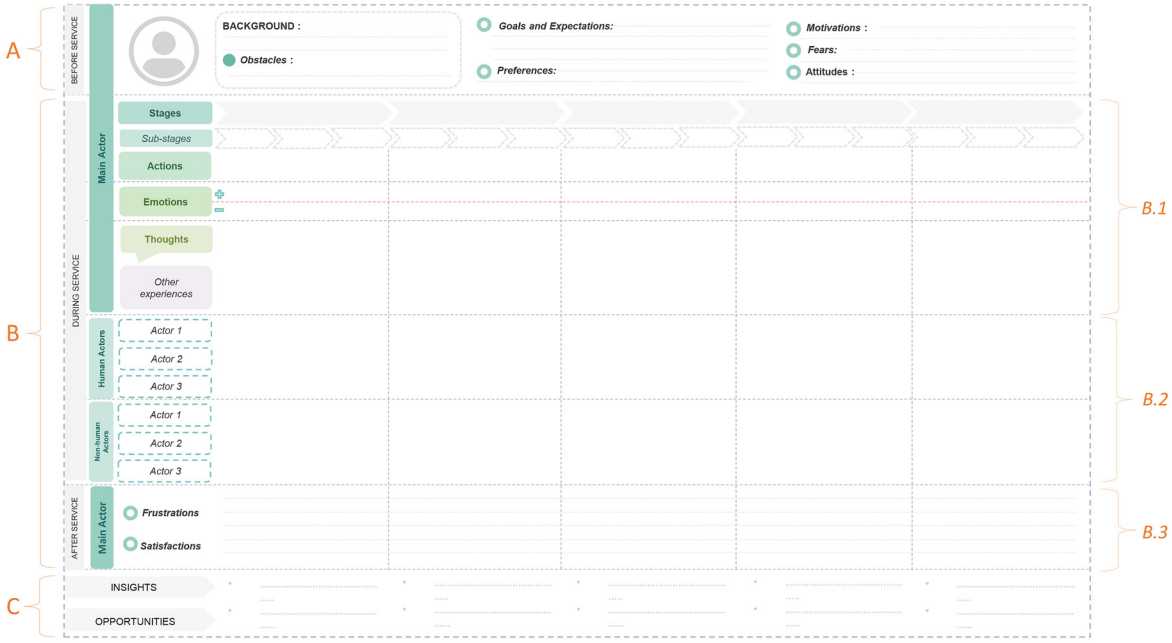

Figure 4. *Journey map canvas for healthcare services.*

Section C aims to generate insights from researcher perspectives that may lead to design ideas and identify potential opportunities for innovation. Table 2 defines the components of the journey map canvas, which can be adjusted on the context and level of detail required. Accordingly, the line *'other experiences (sensory experiences, etc.)'* has been added to the components on the vertical axis in section B.

4.2. Phase 2: Using the journey map

The purpose of this section is to review the components of the journey map canvas for healthcare services and to evaluate its representation ability. Firstly, a set of questions was prepared for the themes that constitute the components of the journey map. Following this, an interview protocol was created and semi-structured interviews were conducted. The interview data underwent thematic analysis to verify the themes. Additionally, the data were processed into a draft canvas to evaluate its representativeness. The steps for using the canvas were also revealed.

4.2.1. Testing themes and ability to represent: A Semi-structured interview

To explore experiences in the healthcare context, direct contact with service users is the most effective method (Simonse et al., 2019). In design research, the semi-structured interview technique is often preferred over quantitative research, such as surveys, as it provides in-depth information while maintaining a certain level of standardization and flexibility. In the second phase of the article, semi-structured interviews were conducted with participants who had undergone cesarean section under regional anesthesia. A prepared set of questions was used to evaluate the basic components and representativeness of the journey map canvas were evaluated.

Structuring of semi-structured interviews

To facilitate the processing of the data obtained from the semi-structured interviews into the journey map canvas, the main stages of the care journey for cesarean section under regional anesthesia were defined. A literature review was conducted to identify the relevant stages of evidence-based practices in medical databases and medical websites. The review was based on the main stages of care pathways that explain the medical process of healthcare from the perspective of a health professional, also known as clinical pathways (Berghella, 2024; Dahlke et al., 2013; Hofmeyr et al., 2009; Kaye et al., 2018; Strand & Dickson, 2019; Wilson et al.,

Table 2. *Description of components.*

COMPONENTS		DESCRIPTION
		Before Service
ZONE A	*Background*	Background activities that have an impact on the evaluation of the service process
	Obstacles	Challenges faced by the main actor prior to the service process
	Goals and Expectations	What kind of health experience the main actor imagines and expects from the process
	Preferences	Factors affecting the main actor's preferences for the service process
	Attitudes	The main actor's tendencies towards different situations experienced/encountered in the process prior to the service
	Motivations	Activities and preparations of the main actor for a good health experience
	Fears	The main actor's fears about the service process
		During Service
ZONE B	*Stages / Sub -Stages*	Stages / sub-stages of the care journey
	Actions	Actions of the main actor during the service
	Thoughts	Thoughts of the main actor during the service
	Emotions	Emotions of the main actor during the service
	Other Experiences	Physical, cognitive, sensory etc. experiences of the service process
	Human Actors	Anyone who can actively contribute to the care journey
	Non-human Actors	Anything that can actively contribute to the care journey
		After Service
	Frustrations	The main actor's frustrations during the service period (pain points)
	Satisfactions	The main actor's satisfaction during the service period (gain points)
		Resarcher Insights
ZONE C	*Insights*	The researcher's insights into the entire service process
	Opportunities	Opportunities from researcher insights

2018). Accordingly, the main stages of the care journey for cesarean section under regional anesthesia are:

- 1. Going to the hospital: This stage covers the process from the preparations made before arriving at the hospital until the hospitalization procedures are completed.
- 2. Preoperative Stage – I (Pre-Cesarean Preparation): This stage involves medical preparations such as obtaining maternal history and conducting blood and urine tests before proceeding to the operating theater. This stage encompasses the process that the mother goes through from her hospital room to the operating theater.
- 3. Preoperative Stage – II (Preparation in Operating Theater): This is the stage where anesthesia is administered and the mother is physically prepared for delivery.
- 4. Intraoperative Stage (Cesarean Delivery): This stage refers to the period between the uterine incision (the removal of the baby from the womb through the incision) and the completion of the surgical closure (suturing) process.

- 5. Postoperative Stage (Post-Cesarean): This stage extensively covers the mother's experiences including mobilization and breastfeeding from transferring to the hospital room after the operation to leaving the hospital.

In determining these main stages, planned cesarean section procedures were taken into account as they have a standardized care pathway. For unplanned cesareans, there may be 'interventions for vaginal delivery' before the second stage.

After defining the main stages of the care journey, semi-structured interview questions were prepared based on these stages and the themes identified in the online document analysis (Figure 2). The questions were structured into pre-service, service process-related and evaluation categories (after service). The language and terminology used by the participants were taken into account when formulating the question patterns. The finalization of the question set was achieved by conducting a pilot study with three women who underwent cesarean section under regional anesthesia (Table 3).

After clarifying the set of questions, an interview protocol was prepared and submitted to the ethics committee for approval. Once approved, semi-structured interviews were conducted with 10 participants (5 women who had given birth by planned cesarean section, 5 women who had given birth by unplanned cesarean section) via the Zoom platform on the agreed interview date, using open-ended questions. The study sample consisted of women who had undergone a cesarean section under regional anesthesia in Turkey within the last ten years, regardless of their primiparous or multiparous status. The reason for this is that studies on gentle cesarean section practices aimed at improving women's experience of cesarean section have increased in the last decade, and procedural changes in cesarean section have also been implemented, such as allowing first breastfeeding in the operating room if medical conditions permit.

Table 3. *Semi-structured interview questions.*

PROBES	INTERVIEW QUESTIONS
	1. Pre-Service Questions
Goals and Expectations, Preferences, Motivations ***etc.***	**Q.1.1.** What kind of birth experience did you imagine during your pregnancy?
	Q.1.2. What did you do to have the birth experience you imagined? Can you share your preparations and what motivates you during pregnancy?
	2. Questions about the service process
Going to the hospital	**Q.2.1.** Can you share your experience before going to the hospital? What did you do during that time?
Interventions for Vaginal Delivery	**Q.2.2.** Can you share your experience from the time you arrived at the hospital until you entered the operating room?
Preoperative Stage – I *(Pre-Cesarean Preparation)*	
Preoperative Stage – II *(Preparation in Operating Theatre)*	**Q.2.3.** Can you describe the operating room in which you gave birth as far as you remember? What was the atmosphere like?
	Q.2.4. How did the staff in the operating theatre prepare you before the birth?
Intraoperative Stage *(Caesarean Delivery)*	**Q.2.5.** Can you share your experience from the start of delivery to the birth of your baby?
	Q.2.6. Can you share your experience in the operating room after your baby was born?
Postoperative Stage *(Post-Cesarean)*	**Q.2.7.** Can you share your experience after leaving the operating room until you go to your own hospital room?
	Q.2.8. Can you share your experience after coming to your hospital room until you leave the hospital?
	3. (After-Service) Evaluation Questions
Frustrations Satisfactions	**Q.3.1.** When you evaluate all the stages, do you think you had a birth experience as you had imagined? Can you share your reasons?

Table 4. *Participant information.*

Groups by Birth Type	Participant	Participant Type	Birth Year
Planned Cesarean	P1	Primipar	2016
	P2	Primipar	2018
	P3	Primipar	2020
	P4	Primipar	2017
	P5	Primipar	2020
Unplanned Cesarean	P6	Primipar	2017
	P7	Primipar	2021
	P8	Primipar	2016
	P9	Primipar	2020
	P10	Multipar	2015

- Primiparous Producing a child for the first time (Cambridge University Press, n.d.)
- Multiparous: Having given birth one or more times before in the past (Cambridge University Press, n.d.)

Furthermore, in retrospective assessments of painful experiences such as those related to medical procedures, the assessment is dominated by the worst and last moments, and this phenomenon is known as the "peak-end memory bias" (Kahneman et al., 1993; Müller et al., 2019). During the data collection phase, participants with traumatic experiences such as the loss of an infant, the birth of a disabled baby were excluded from the sample to reduce the effect of better remembering negative experiences during the birth process.

Analysis of semi-structured interviews

After completing the semi-structured interviews, the interview data was transferred to MAXQDA (VERBI Software, 2021) for thematic analysis reviewing the components of the journey map canvas. The relevant themes were formed deductively in line with the themes from the online narratives. The Code Matrix Browser, one of MAXQDA's visual tools, was again used to show which themes came from which participants (Figure 5). The obtained themes were consistent with the themes from the online narratives.

Secondly, the semi-structured interview data that was thematically analyzed in MAXQDA was processed in Microsoft Excel spreadsheets based on the components of the journey map canvas (Figure 6). Figure 6 also indicates the corresponding section of the Excel spreadsheet where the data from the semi-structured interview questions were processed, demonstrating how the data is distributed across the basic components of the map. The spreadsheets that emerged by processing the data into the relevant themes presented an understandable holistic view of the experience. The aim of this study was to evaluate the representativeness and consistency of the journey map canvas through a visualization template.

Accordingly, the following steps were followed to create a journey map for the cesarean delivery experience under regional anesthesia:

- 1. Identification of the main stages and sub-stages of the care journey: The stages and sub-stages of the care journey were listed in order to structure the participant's experience along a time axis. The sub-stage order in Figure 6 may vary for each participant based on the hospital's procedure for the cesarean section. It is advisable to limit the number of steps for sub-stages to

20 per journey, to avoid confusion (Cramer, 2022).

- 2. Identification of human and non-human actors: Based on Bogner's (2007) healthcare context, human actors typically come from the social environment including family, caregivers and professionals. Non-human actors, on the other hand, can be found in the ambient conditions such as temperature, light, the physical environment including medical equipment, room and furniture, organizational factors such as organizational structure and policies, and legal-regulatory subsystems including regulatory systems, reimbursement policy (Goossens, 2017c). Accordingly, human and non-human actors for

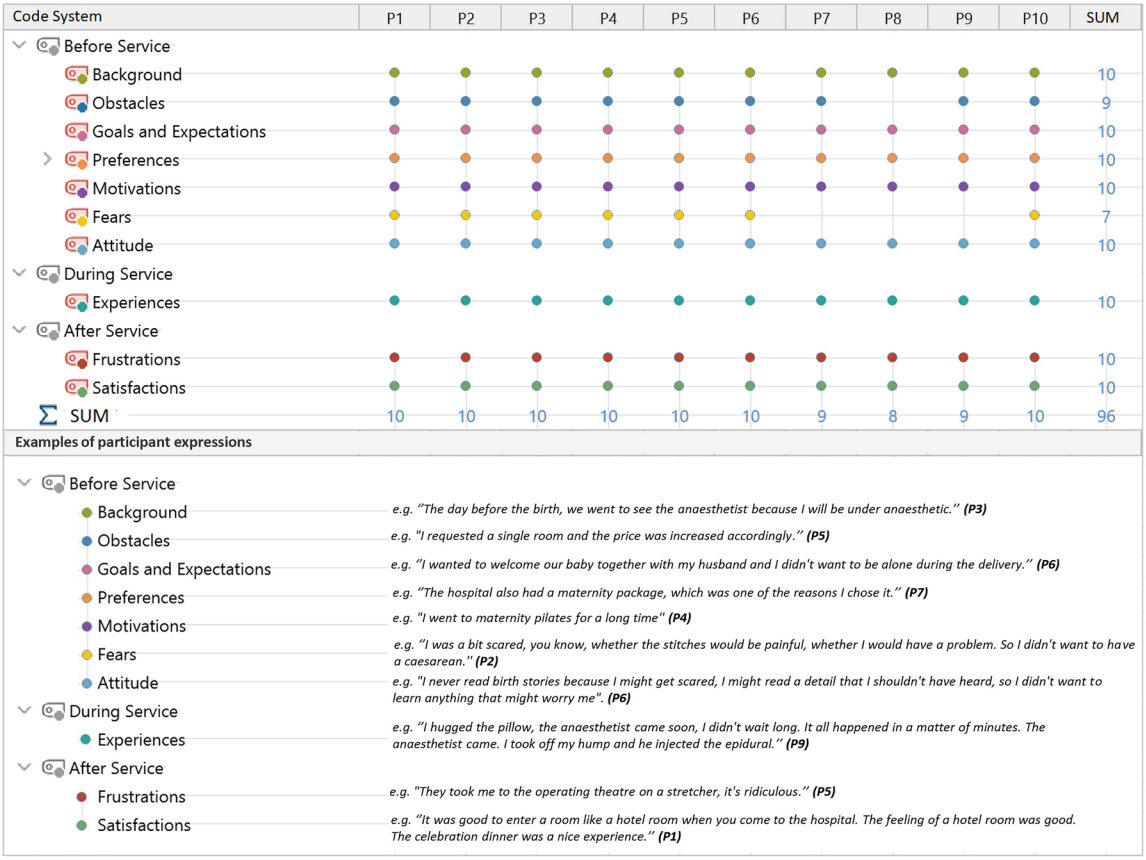

Figure 5. *Distribution of themes according to semi-structured interviews [2] (MAXQDA, 2022).*

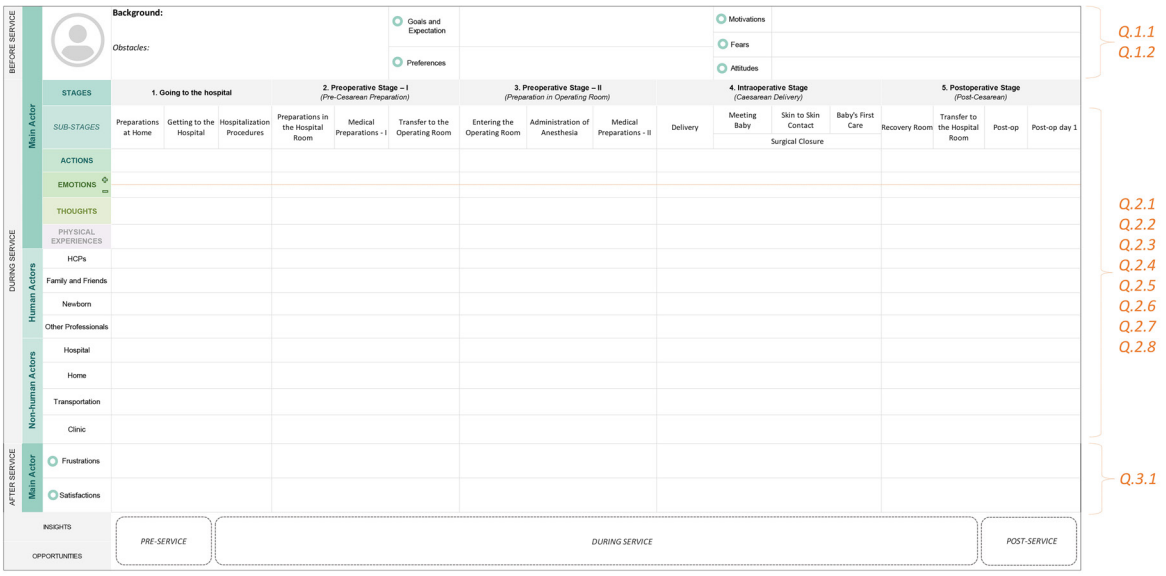

Figure 6. *Journey map template for cesarean section and distribution of questions.*

the relevant experience were identified based on the data from online narratives and semi-structured interviews and were aligned with existing literature (see Sung & Mahdy, 2023). The main actor in this study was positioned as the woman giving birth by cesarean section under regional anesthesia. Human actors included health professionals, family and friends, the newborn, and other professionals. Non-human actors included the hospital, home, transport, and clinic.

- 3. Mapping the lens*:* The data from the semi-structured interviews were processed into the relevant part such as fears, obstacles and attitudes etc. in order to understand the background and the main actor.
- 4. Mapping the experience: The data from the semi-structured interviews were mapped stage by stage. The participant's actions, emotions, thoughts, frustrations and satisfactions were mapped to the appropriate stage of the journey. Negative and positive emotions were separated when mapping emotions. Direct quotes from the interviews were added when mapping thought. Furthermore, the section labeled 'other experiences' utilized to describe physical experiences within the context of the case study. This theme is a subcategory of the broader theme of 'experiences' found online narratives. It encompasses the mother's experiences of feeling cold, shivering, etc.
- 5. Mapping the interaction between the main actor and other actors: Touchpoints as interactions of the main actor with other actors such as the nurse assisting with breastfeeding and etc. were identified and mapped by matching human and non-human actors to the appropriate stage of the journey. Frustrations and satisfactions at these touchpoints were then addressed at the appropriate stages.
- 6. Generating insights and opportunities: The insights and opportunities derived from the mapped experience are listed as 'pre-service, during service and post-service'.

5. Discussion

This paper focuses on developing a journey map canvas through an inductive case study to facilitate the healthcare design process for designers and design researchers working in the healthcare field. Although the proposed canvas (Figure 4) represents a holistic analysis of the delivery of cesarean section under regional anesthesia, it has the potential to be used in different contexts, including other healthcare services through the components of the template such as goals and expectations, motivations, preferences, fears, obstacles etc. (Table 2). It also allows for a broader and structured view of an experience as it focuses not only on the experience of the main actor but also on the interactions of the main actor with other actors (Figure 4, B.2). That is also why human and non-human actors are embedded into the ontology of the canvas as one of the outputs of this study. In addition, being used by design professionals and design researchers, this tool can also benefit other stakeholders such as practitioners and health professionals, playing a complementary role in multidisciplinary teams. The aim is to facilitate the processes of healthcare improvement by encouraging creative thinking among designers and different stakeholders. The ontology of the map provides a framework to evaluate experiences by imposing constraints. The process of creating the canvas may also contribute to the literature, and can be used to develop further journey maps in healthcare.

Design researchers working in healthcare face important challenges, particularly when dealing with sensitive situations and interviewing vulnerable groups about ethical terms and conditions. Therefore, the structure of interview questions is crucial. The set of questions prepared for the usability of the canvas has the potential to guide and adapt to for design researchers. The questions are formulated to reveal experiences rather than the emotional responses to prevent peak-end memory bias.

Apart from the advantages summarized above, the journey map can-

vas has also some limitations. Journey maps provide a user-centered view (Marquez et al., 2015) and are used to showcase the healthcare experience from the perspective of the healthcare recipient (McCarthy et al., 2016). It is widely acknowledged that the effective way to learn about the healthcare experience is through direct and face-to-face contact with healthcare recipient (Layton et al., 1998; Simonse et al., 2019). This study created journey maps based on data obtained from the perspective of the mother, who was the main actor of the study.

However, designing the service solely from a one sided perspective may raise concerns about its reliability. Therefore, aligning the service map from the viewpoints of different actors such as care providers (using meta-alignment diagrams) and conducting comparative analyses will enhance the research outputs and provide a more comprehensive understanding of the experience from different perspectives (Cook, 2017). Expert opinion can be useful complement to evidence-based research, particularly when defining the stages of the care journey and the interdependencies of actors. While some studies suggest that engaging stakeholders in the journey mapping process can be challenging when working with a multidisciplinary team (Kaplan, 2016b), it is still recommended to collaborate with others in the journey mapping process by inviting different actors to participate in the process of compiling and mapping (Cramer, 2022; Kaplan 2016b). Accordingly, while sections A and B of the template were created with data from the main actor's perspective, it is recommended to incorporate evidence-based research and expert opinion to identify the stages of the care journey (B.1) and map the main actor's interaction with other actors (B.2). Collaboration with care providers is advised, particularly for part C of the canvas.

The healthcare recipient's experience is comprehensive, so all map components are necessary to evaluate the relevant health services with a holistic and in-depth approach. Therefore, the journey maps are extensively detailed, and accessibility, readability, and regulation of information require intensive work. To ensure all components are visible and readable, a fragmented presentation of the canvas is proposed was proposed here. To enhance the readability and communication power of the map, it was decided to present zones A, B (B.1, B.2, B.3) and C (Figure 4) separately to stakeholders. Similarly, mapping each stage of the care journey in isolation is envisaged to reduce complexity. Creating a separate journey map for each main stage can also reduce the amount of information needed in a single journey map. In this context, studies suggest that creating multiple journey maps or additional structures is better than to collecting too much information in a single visualization (Maddox et al., 2019). It is also recommended to start mapping from a more general perspective and divide it into more detailed maps to create a pool of journey maps (Rainer, 2022). A well-structured presentation can help stakeholders in comprehending the customer journey map leading to improved decision-making and more effective through enhanced communication and collaboration between teams (Rainer, 2020).

The journey map template was used to carry out six steps with 10 participants, resulting in an overview of their care journeys. The resulting maps provided a low-fidelity visualization of each participant's journey of the cesarean experience. Although high-fidelity maps are easier to read and they are less flexible due to their 'finished' nature. On the other hand, low fidelity maps are reported to be better at the early stages of the design process and are more powerful for collaborating, revising and updating (Gibbons, 2017). As the main purpose of this study is to obtain a holistic view of the experience, obtaining low-fidelity maps is beneficial.

However, the proposed final step in addition to the 6 steps of journey map template outlined above is to create a 'high fidelity visualization of the map' to represent the journey in a readable way once the synthesis of the data is complete. Improving the map's visualization can be achieved by adding images, using different color codes,

creating storyboards (Cramer, 2022; Flitton, 2016), and using advanced visualization tools. This can help users navigate the map more efficiently and empathize with the main actor (Grillmayr, 2020). The final step 'high fidelity visualization of the map', fosters the map's communicative qualities and the makes the research findings more readable. After the 7th step is taken, the journey map becomes a more effective communication tool for sharing research findings in an engaging way as stated by Kaplan (2017).

Different regions may have certain distinct regulations regarding healthcare services. Therefore, the representativeness of the proposed canvas can be increased proportionally with larger user groups and different stakeholders from various regions. Mixed methods such as workshops with health professionals, focus group discussions and interviews can be conducted to better understand and evaluate the contextual use of the resulting map. This study proposes a methodology for systematically organizing and presenting a story based on participant narratives through a journey map canvas. The canvas can be utilized in the exploratory phase of design research to identifying and research problems in-depth. In future studies, these maps can be used to generate ideas and solutions within a multidisciplinary team. The canvas proposed, in this case was created directly from data obtained from a real person. It can also be created using personas that represent larger healthcare recipient profiles to help designers and design researchers better understand the mental models (McCarthy et al., 2016) and evaluate a larger population.

The provision of journey mapping tools to explore the healthcare service experience is very limited. This study aims to address this gap from a holistic perspective. It is important to note that the journey map canvas presented in this case study is still in the testing and evaluation phase. Therefore, further research is required to determine the acceptability of the draft canvas in different contexts. The effectiveness of the canvas can be improved through case studies in different fields. Therefore, further research is necessary to create healthcare journey mapping canvases that are adaptable, accessible, encourage feedback, provide the opportunity to generate insights and help externalize domain knowledge, thereby improving the care process.

Acknowledgment

The semi-structured interview questions in this article has been approved by the Istanbul Technical University (ITU) Humanities and Social Sciences Committee of Human Research Ethics (Project No: 264). We would like to thank the participants who contributed to this study by sharing their birth experiences.

Endnotes

[1] Cesarean delivery is a procedure in which a baby is delivered through a surgical incision of the mother's abdominal and uterine walls (Afolabi & Lesi, 2012). In cesarean section under regional anesthesia, the body is numbed from the waist down. The mother is conscious during the delivery and can see her baby immediately afterwards (IQWiG, 2008).

[2] To enhance clarity and readability of the Code Matrix Browser, the circles representing code presence was colored with code colors and unnecessary lines were removed. The code matrix browser has also been expanded and modified by including examples from participant expressions.

References

Afolabi, B. B., & Lesi, F. E. (2012). Regional versus general anaesthesia for cesarean section. *Cochrane Database of Systematic Reviews.* https://doi.org/10.1002/14651858.CD004350.pub3

Alves, J. (2022, March 22). *Omnichannel customer journey maps – designing experiences across channels.* Smaply Blog. https://www.smaply.com/blog/omnichannel-customer-journey

Andreassen, T. W., Kristensson, P., Lervik-Olsen, L., Parasuraman, A., McColl-Kennedy, J. R., Edvardsson, B., & Colurcio, M. (2016). Linking service design to value creation and service research. *Journal of Service*

Management, 27(1), 21-29. https://doi.org/10.1108/JOSM-04-2015-0123

Asiyanbola, O., Ohaeri, B., & Ojo, I. O. (2022). Cesarean section: A delivery option and a life-saving method of delivery among pregnant women. *Commonwealth Journal of Academic Research (CJAR.EU), 3*(12), 1-11. https://doi.org/10.5281/zenodo.7527418

Berghella, V. (2024). *Cesarean delivery: Surgical technique*. UpToDate. Retrieved August 18, 2023, from https://www.uptodate.com/contents/cesarean-delivery-surgical-technique

Bogner, M. S. (2007). The Artichoke Systems Approach for identifying the why of error. In P. Carayon (Ed.), *Handbook of Human Factors and Ergonomics in Health Care and Patient Safety* (pp. 109-126). Mahwah, NJ: Lawrence Erlbaum Associates.

Cambridge University Press. (n.d.). Primiparous. In *Cambridge dictionary*. Retrieved August 12, 2023, from https://dictionary.cambridge.org/dictionary/english/primiparous

Cambridge University Press. (n.d.). Multiparous. In *Cambridge dictionary*. Retrieved August 12, 2023, from https://dictionary.cambridge.org/dictionary/english/multiparous

Capogna, G., & de Boer, H. (2017). Humanization of Cesarean Section. In G. Capogna (Ed.), *Anesthesia for Cesarean Section* (pp. 193-204). Springer. https://doi.org/10.1007/978-3-319-42053-0_13

Cook, A. (2017, December 28). *Case study: VA HIT modernization journey mapping*. Making UX Better. https://makinguxbetter.com/portfolio/ehmp-journey-maps/

Cramer, A. (2022, October 20). *The basics of customer journey mapping*. Smaply Blog. https://www.smaply.com/blog/customer-journey-mapping

Dahlke, J. D., Mendez-Figueroa, H., Rouse, D. J., Berghella, V., Baxter, J. K., & Chauhan, S. P. (2013). Evidence-based surgery for cesarean delivery: An updated systematic review. *American Journal of Obstetrics & Gynecology, 209*(4), 294-306. https://doi.org/10.1016/j.ajog.2013.02.043

Davies, E. L., Bulto, L. N., Walsh, A., Pollock, D., Langton, V. M., Laing, R. E., Graham, A., Arnold-Chamney, M., & Kelly, J. (2023). Reporting and conducting patient journey mapping research in healthcare: A scoping review. *Journal of Advanced Nursing, 79*(1), 83–100. https://doi.org/10.1111/jan.15479

Davis-Floyd, R. (2001). The technocratic, humanistic, and holistic paradigms of childbirth. *International Journal of Gynecology and Obstetrics, 75*(sup1), S5-S23.

Ekman, I., Swedberg, K., Taft, C., Lindseth, A., Norberg, A., Brink, E., Carlsson, J., & Sunnerhagen, K. S. (2011). Person-centered care—Ready for prime time. *European Journal of Cardiovascular Nursing, 10*(4), 248–251. https://doi.org/10.1016/j.ejcnurse.2011.06.008

Flitton, C. (2016, October 6). *Best practices for building a customer journey map*. MyCustomer. Retrieved May 27, 2023, from https://www.mycustomer.com/customer-experience/engagement/best-practices-for-building-a-customer-journey-map

Gay, L. R. (1987). *Educational research competencies for analysis and application* (3rd ed.). London: Merrill Publishing Company.

Gibbons, S. (2017, November 5). *UX Mapping Methods Compared: A Cheat Sheet*. Nielsen Norman Group. https://www.nngroup.com/articles/ux-mapping-cheat-sheet/

Gibbons, S. (2018, December 9). *Journey Mapping 101*. Nielsen Norman Group. https://www.nngroup.com/articles/journey-mapping-101/

Goossens, R. (2017a). Module 4: Solving problems & creating ideas [MOOC lecture]. In R. Goossens, *Design in healthcare: Using patient journey mapping*. edX. https://ocw.tudelft.nl/course-lectures/4-2-1-wider-perspective/?course_id=22692

Goossens, R. (2017b). Module 2: Defining axes [MOOC lecture]. In R. Goossens, *Design in healthcare: Using patient journey mapping*. edX. https://ocw.tudelft.nl/course-lectures/2-2-1-wider-perspective/?course_id=22692

Goossens, R. (2017c). Module 1: Understanding the system [MOOC lecture]. In R. Goossens, *Design in healthcare: Using patient journey mapping*. edX. https://ocw.tudelft.nl/course-readings/1-2-2-handy-information/?cour-

se_id=22692

Grillmayr, I. (2020). *Templates for customer journey maps, personas and stakeholder maps*. Smaply Blog. https://www.smaply.com/blog/workshop-templates

Groeneveld, B., Dekkers, T., Boon, B., & D'Olivo, P. (2018). Challenges for design researchers in healthcare. *Design for Health, 2*(2), 305-326. https://doi.org/10.1080/24735132.2018.1541699

Hine, C. (2000). *Virtual ethnography*. Sage Publications Limited. https://doi.org/10.4135/9780857020277

Hine, C. (2011, Spring). Internet research and unobtrusive methods. *Social Research Update, (61),* 1-4. https://www.proquest.com/scholarly-journals/internet-research-unobtrusive-methods/docview/889136574/se-2

Hofmeyr, J. G., Novikova, N., Mathai, M., & Shah, A. (2009). Techniques for cesarean section. *American Journal of Obstetrics & Gynecology, 201*(5), 431-444. https://doi.org/10.1016/j.ajog.2009.03.018

Howard, T. (2014). Journey mapping: A brief overview. *Communication Design Quarterly Review, 2*(3), 10–13. https://doi.org/10.1145/2644448.2644451

Joseph, A. L., Kushniruk, A. W. & Borycki, E. M. (2020). Patient journey mapping: Current practices, challenges and future opportunities in healthcare. *Knowledge Management & E-Learning, 12*(4), 387–404. https://doi.org/10.34105/j.kmel.2020.12.021

Kahneman, D., Fredrickson, B. L., Schreiber, C. A., & Redelmeier, D. A. (1993). When more pain is preferred to less: Adding a better end. *Psychological Science, 4*(6), 401-405. https://doi.org/10.1111/j.1467-9280.1993.tb00589.x

Kalbach, J. (2016). *Mapping experiences: A complete guide to creating value through journeys, blueprints, and diagrams*. Sebastopol, CA: O'Reilly Media.

Kaplan, K. (2016a, July 31). *When and how to create customer journey maps*. Nielsen Norman Group. https://www.nngroup.com/articles/customer-journey-mapping

Kaplan, K. (2016b, October 16). *Journey Mapping in Real Life: A Survey of UX Practitioners*. Nielsen Norman Group. https://www.nngroup.com/articles/journey-mapping-ux-practitioners/

Kaplan, K. (2017, May 28). *The 5 Steps of Successful Customer Journey Mapping*. Nielsen Norman Group. https://www.nngroup.com/articles/customer-journey-mapping-process/

Kaye, M. R., Rieger, M., Gavrizi, S., Harkins, J., Keller, W., & White, A. (2018). Implementation of evidence-based cesarean section (CS) technique. *Obstetrics & Gynecology, 131*, 89S. https://doi.org/10.1097/01.AOG.0000533399.29269.1f

Layton, A., Moss, F., & Morgan, G. (1998). Mapping out the patient's journey: Experiences of developing pathways of care. *Quality in Health Care, 7*(Suppl.), S30–S36.

Lee, D. (2017). HEALTHQUAL: A multi-item scale for assessing healthcare service quality. *Service Business, 11*(1), 491–516. https://doi.org/10.1007/s11628-016-0317-2

Lee, D. (2019). A model for designing healthcare service based on the patient experience. *International Journal of Healthcare Management, 12*(3), 180-188. https://doi.org/10.1080/20479700.2017.1359956

Ly, S., Runacres, F., & Poon, P. (2021). Journey mapping as a novel approach to healthcare: A qualitative mixed methods study in palliative care. *BMC Health Services Research, 21, Article* 915. https://doi.org/10.1186/s12913-021-06934-y

Madathil, S. C., Lopes, A. J., & Alfred, M. (2020). Patient journey mapping: A literature review. *Proceedings of the 2020 IISE Annual Conference*, 937-942. Retrieved from https://www.proquest.com/scholarly-journals/patient-journey-mapping-literaturereview/docview/2511386708/se-2

Maddox, K., Baggetta, D., Herout, J., & Ruark, K. (2019). Lessons learned from journey mapping in health care. *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care, 8*(1), 105-109. https://doi.org/10.1177/2327857919081024

Marquez, J., & Downey, A. (2015). Service design: An introduction to a holistic assessment methodology of library services. *Weave Journal of Library*

User Experience, 1(2). http://dx.doi.org/10.3998/weave.12535642.0001.201

Marquez, J. J., 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. https://doi.org/10.1080/10875301.2015.1107000

Markham, A. (1998). *Life Online: Researching Real Experience in Virtual Space*. CA: Alta Mira Press.

McCarthy, S., O'Raghallaigh, P., Woodworth, S., Lim, Y. L., Kenny, L. C., & Adam, F. (2016). An integrated patient journey mapping tool for embedding quality in healthcare service reform. *Journal of Decision Systems, 25*(Suppl.1), 354-368. https://doi.org/10.1080/12460125.2016.1187394

Mercier, R. J., & Durante, J. C. (2018). Physician and nurse perceptions of gentle cesarean birth. *The American Journal of Maternal Child Nursing, 43*(2), 97–104. https://doi.org/10.1097/NMC.0000000000000404

Moeke, D. & van Andel, J. (2017). What a Healthcare Recipient Values in Hospital Care: A Multi-Layered Identity Approach. *SSRN*. http://dx.doi.org/10.2139/ssrn.3089140

Müller, U. W. D., Witteman, C. L. M., Spijker, J., & Alpers, G. W. (2019). All's bad that ends bad: There is a peak-end memory bias in anxiety. *Frontiers in Psychology, 10*, Article 1272. https://doi.org/10.3389/fpsyg.2019.01272

Institute for Quality and Efficiency in Health Care (IQWiG). (2008, March 19). Pregnancy and birth: Cesarean sections: What are the pros and cons of regional and general anesthetics? In *InformedHealth.org*. Cologne, Germany. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK279566/

National Childbirth Trust. (2022). *What is a cesarean birth?* Retrived from https://www.nct.org.uk/labour-birth/different-types-birth/cesarean-birth/what-cesarean-birth

National Health Service. (2019). *Cesarean section.* Retrived from https://www.nhs.uk/conditions/cesarean-section/

National Institute of Health and Clinical Excellence. (2021). *Cesarean birth* (NICE Guideline NG192). https://www.nice.org.uk/guidance/ng192

Pandey, S. K., Hart, J. J., & Tiwary, S. (2003). Women's health and the internet: Understanding emerging trends and implications. *Social Science & Medicine, 56*(1), 179–191. https://doi.org/10.1016/s0277-9536(02)00019-9

Partridge, R. (2017). Understanding the roles of the designer in health care: A practice-based study into supporting adolescents with long-term conditions. *Design Journal, 20*(4), 523–532. https://doi.org/10.1080/14606925.2017.1325586

Pell, A. (2022, August 21). *Pains and gains: How to give your customers what they want*. Zapier. https://zapier.com/blog/pains-and-gains/

Philpot, L. M., Khokhar, B. A., DeZutter, M. A., Loftus, C. G., Stehr, H. I., Ramar, P., Madson, L. P., & Ebbert, J. O. (2019). Creation of a patient-centered journey map to improve the patient experience: A mixed methods approach. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 3*(4), 466–475. https://doi.org/10.1016/j.mayocpiqo.2019.07.004

Price, B. (2006). Exploring person-centred care. *Nursing Standard, 20*(50), 49–56. https://doi.org/10.7748/ns2006.08.20.50.49.c4487

Price, A. D. F., & Lu, J. (2012). Impact of hospital space standardization on patient health and safety. *Architectural Engineering and Design Management, 9*(1), 49–61. https://doi.org/10.1080/17452007.2012.688522

Rainer, K. (2020). *Beyond words: How to present a customer journey map that gets you buy-in*. Smaply Blog. https://www.smaply.com/blog/presenting-customer-journeys

Rainer, K. (2022a). *What is patient journey mapping and how to do it?* Smaply Blog. https://www.smaply.com/blog/patient-journey-mapping

Rainer, K. (2022b). *12 tips on how to create a customer journey map that provides real insights*. Smaply Blog. https://www.smaply.com/blog/10-tips-for-journey-mapping

Rawson, A., Duncan, E., & Jones, C. (2013). The truth about customer experience. *Harvard Business Review, 91*(9), 90–98.

Reay, S. D., Collier, G., Douglas, R., Hayes, N., Nakarada-Kordic, I., Nair,

A., & Kennedy-Good, J. (2017). Prototyping collaborative relationships between design and healthcare experts: Mapping the patient journey. *Design for Health, 1*(1), 65–79. https://doi.org/10.1080/24735132.2017.1294845

Rosenbaum, M. S., Otalora, M. L., & Ramírez, G. C. (2017). How to create a realistic customer journey map. *Business Horizons, 60*(1), 143-150. https://doi.org/10.1016/j.bushor.2016.09.010

Sijm-Eeken, M., Zheng, J., & Peute, L. (2020). Towards a Lean Process for Patient Journey Mapping - A Case Study in a Large Academic Setting. *Studies in Health Technology and Informatics, 270*, 1071–1075. https://doi.org/10.3233/SHTI200326

Simonse, L., Albayrak, A., & Starre, S. (2019). Patient journey method for integrated service design. *Design for Health, 3*(1), 82–97. https://doi.org/10.1080/24735132.2019.1582741

Smith, J., Plaat, F., & Fisk, N. M. (2008). The natural cesarean: A woman-centred technique. *BJOG: An International Journal of Obstetrics and Gynaecology, 115*(8), 1037–1042. https://doi.org/10.1111/j.1471-0528.2008.01777.x

Strand, E. A., & Dickison, S. M. (2019, April 17). *Evidence-based cesarean delivery guidelines*. Contemporary OB/GYN. Retrieved from https://www.contemporaryobgyn.net/view/evidence-based-cesarean-delivery-guidelines-0

Sung, S., & Mahdy, H. (2024). Cesarean Section. In *StatPearls*. Treasure Island, FL: StatPearls Publishing. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK546707/

Sweeney, J. C., Danaher, T. S., & McColl-Kennedy, J. R. (2015). Customer effort in value cocreation activities: Improving quality of life and behavioral intentions of health care customers. *Journal of Service Research, 18*(3), 318–335. https://doi.org/10.1177/1094670515572128

Tsekleves, E., & Cooper, R. (2017). Emerging trends and the way forward in design in healthcare: An expert's perspective. *The Design Journal, 20*(Suppl.1), S2258–S2272. https://doi.org/10.1080/14606925.2017.1352742

VERBI Software. (2021). MAXQDA 2022 [Computer Software]. Berlin, Germany: VERBI Software. Available from maxqda.com.

Wildevuur, S. E. (2017). Could health learn from design? *Design for Health, 1*(1), 59–64. https://doi.org/10.1080/24735132.2017.1295707

Wilson, R. D., Caughey, A. B., Wood, S. L., Macones, G. A., Wrench, I. J., Huang, J., Norman, M., Pettersson, K., Fawcett, W. J., Shalabi, M. M., Metcalfe, A., Gramlich, L., & Nelson, G. (2018). Guidelines for Antenatal and Preoperative care in Cesarean Delivery: Enhanced Recovery After Surgery Society Recommendations (Part 1). *American Journal of Obstetrics and Gynecology, 219*(6), 523.e1–523.e15. https://doi.org/10.1016/j.ajog.2018.09.015