

A service concept and tools to improve maternal and newborn health in Nigeria and Uganda

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Abstract

Objective: The “Better Outcomes in Labor Difficulty” (BOLD) project used a service design process to design a set of tools to improve quality of care during childbirth by strengthening linkages between communities and health facilities in Nigeria and Uganda. This paper describes the Passport to Safer Birth concept and the tools developed as a result.

Methods: Service design methods were used to identify facilitators and barriers to quality care, and to develop human-centered solutions. The service design process had three phases: Research for Design, Concept Design, and Detail Design, undertaken in eight hospitals and catchment communities.

Results: The service concept “Better Beginnings” comprises three tools. The “Pregnancy Purse” provides educational information to women throughout pregnancy. The “Birth Board” is a visual communication tool that presents the labor and childbirth process. The “Family Pass” is a set of wearable passes for the woman and her supporter to facilitate communication of care preferences.

Conclusion: The Better Beginnings service concept and tools form the basis for the promotion of access to information and knowledge acquisition, and could improve communication between the healthcare provider, the woman, and her family during childbirth.

KEYWORDS

Co-design; Maternal health; Newborn health; Nigeria; Quality of care; Service concept; Service design; Uganda

1 | INTRODUCTION

Good quality maternity care is a multidimensional concept that includes timely, effective, and appropriate use of clinical and non-clinical interventions that are sensitive to women’s values and preferences.¹ To achieve improved quality of care, efforts are needed to address both facility- and community-based factors, including perceptions of quality, decision-making processes, and demand for woman-centered services. There is growing recognition of the importance of including the perspectives of service users and providers to improve

quality and organization of care.^{2–4} However, the expectations, needs, and values of women and communities have often been neglected in the design of maternity services, particularly in low- and middle-income countries.

To address this gap, the WHO initiated the “Better Outcomes in Labour Difficulty” (BOLD) project to improve quality of care during facility-based childbirth. The BOLD project was conducted in Nigeria and Uganda, two settings with a high burden of maternal and neonatal morbidity and mortality. As part of this project, the concept of the “Passport to Safer Birth” (PSB) was developed, its aim to increase

community-based demand for high-quality labor and childbirth care using an innovative set of service prototypes and tools.⁵ By “service prototypes and tools” we mean tested design proposals that improve or enable new types of interactions between communities and health facilities. A user-centered service design approach was used to co-design solutions for quality improvement together with women, their families, healthcare providers, and administrators.⁵

The aim of the present paper is to outline the PSB service concept and to describe in detail the tools developed as part of the BOLD project.

2 | MATERIALS AND METHODS

The methodology of the service design approach used to develop the PSB service concept is described in detail by Salgado et al.⁶ In summary, there were three phases to the service design process: (1) Research for Design; (2) Concept Design; and (3) Detail Design. During the Research for Design phase, desk research was conducted to understand the context and design field research activities in Nigeria and Uganda. Service design research (interviews, group discussions, observations) was conducted in Abuja and Akure, Nigeria, and in Kampala and Bududa, Uganda, to explore user and provider interactions with the health systems, and to map a woman’s journey and her needs from the community to the health facility. The design team analyzed the interviews, observations, and mapping exercise to generate a set of themes and narratives describing women’s barriers to receiving and demanding good quality of care. These themes were mapped onto the woman’s journey to the health facility, and developed into a set of design goals and opportunities to guide the development of service solutions.

The Concept Design phase is a creative, iterative, and unstructured set of ideation workshops conducted with key stakeholders in Nigeria and Uganda to consider a range of ideas and solutions, without yet considering feasibility, viability, or usability. Ideas were rapidly developed into testable prototypes and role-playing scenarios, which were then further evolved or discarded depending on usefulness and acceptability to potential end users.

During the Detail Design phase, three proposed design solutions were developed into design proposals, which define the physical, visual, functional, and contextual aspects of the tools and were tested for their usability, functionality, and desirability by distributing the tools to users (healthcare providers, women, and partners) in Nigeria and Uganda. The design team observed the usage of the tools, engaged in discussions to further refine the functionalities and learn how well or not the content was understood, and how clear the purpose of the tool was to them. The present paper describes the resulting tools in detail.

2.1 | Ethical considerations

Ethics approval was obtained from the Ethics Research Committee of the Federal Capital Territory, the Research Ethics Review Committee of Ondo State Ministry of Health, and the UI/UCH Ethics Committee of the University of Ibadan in Nigeria, and the Makerere University School of Health Sciences Research and Ethics Committee, Uganda.

Ethics approval was also obtained from the Ethics Committee of the WHO. All participants provided written informed consent prior to engaging in research activities.

3 | RESULTS

3.1 | Negotiated standards of care

A key aspect of designing the service concept for the PSB was linkage of the tools to a set of negotiated standards of care, which were reviewed and subscribed to by healthcare providers, facility administrators, and potential service users in the communities.⁷ The negotiated standards of care outline effective and ineffective behaviors and interactions between healthcare providers and women as informed by the WHO quality of care framework for pregnant women and newborns.¹ The PSB service concept aims to concretize the effective behaviors outlined in the negotiated standards into actual behaviors by offering tools that support and facilitate certain interactions between the pregnant woman and the healthcare providers. The tools focus primarily on the three domains of women’s experience of quality of care: effective communication, respect and dignity, and emotional support.¹

3.2 | “Better Beginnings”

A service experience is a series of touchpoints along a journey, and each touchpoint has the power to influence the perception, expectation, and behavior of a service user toward a service offering. By touchpoint, we mean moments when clients come into contact with what is being offered by the service. During pregnancy, a woman has many encounters with touchpoints of maternal health-related service provision; for example, through community health worker visits, antenatal care visits, pharmacy visits, or discussions with friends or family members about past experiences.

The way in which a service is communicated and how it is delivered are equally relevant. The brand of a service communicates the service promise a client should buy into, sets expectations, and communicates the values to the client. The brand is therefore an important linkage between the service promise and the service experience. To capture the intent of the service design ideals that emerged from the project, the term “Better Beginnings” was used to communicate the service promise to both clients and providers. The term was also intended to be clearly distinguishable, relatable, acceptable, and memorable. The Better Beginnings service is designed to be introduced to the pregnant woman at her first antenatal care visit.

Three Better Beginnings tools were developed as a result of the service design process⁶: (1) the “Pregnancy Purse”; (2) the “Birth Board”; and (3) the “Family Pass.” Between them, the tools are designed to provide the pregnant and laboring woman and her family with a sense of a seamless journey through the maternity services, and with positive messages about health and well-being (Fig. 1). The journey is an important concept as it expresses the intent for the different tools to work together across the service. If the same concepts and messages

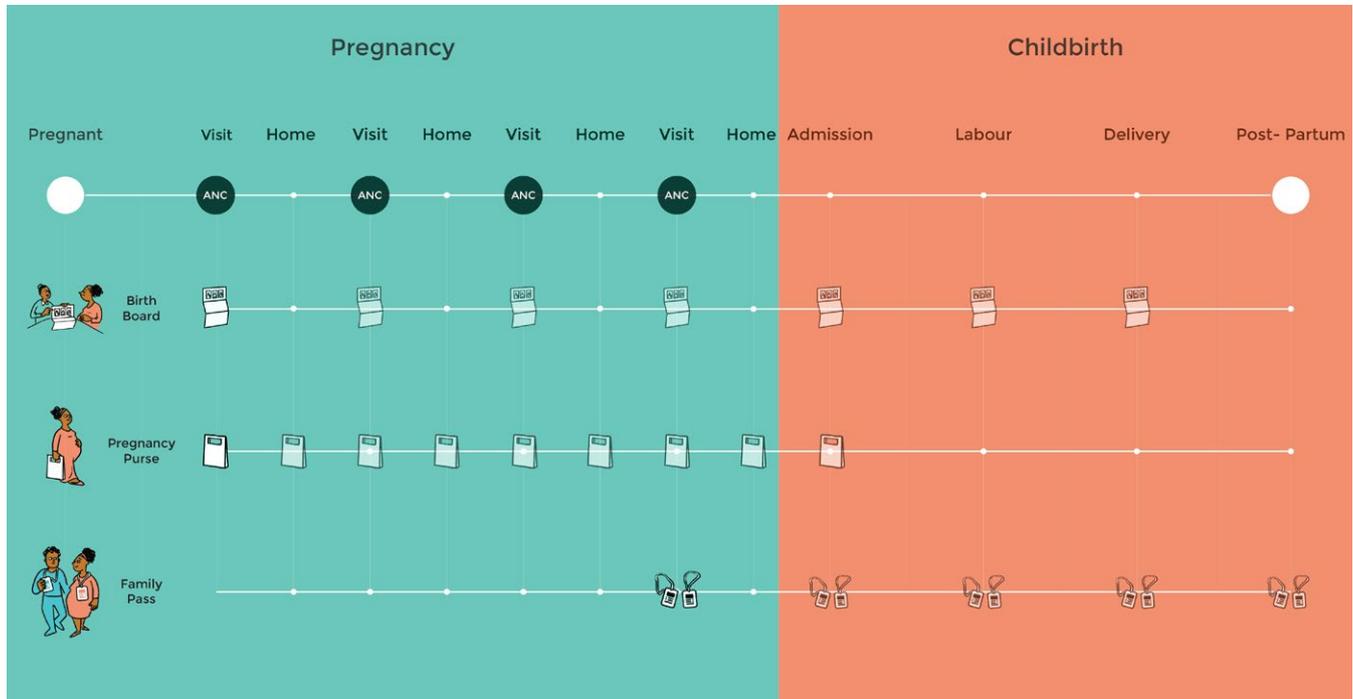


FIGURE 1 The journey of the pregnant woman from antenatal care through childbirth to postpartum. Each horizontal line represents one of the three tools. The icons represent the moments in the journey when a tool is used.

are used by all staff, they are more likely to be learnt and remembered. The branding could also help the woman and her family to recognize and engage with the service.

3.3 | Better Beginnings tools

3.3.1 | The Pregnancy Purse

The design research phase revealed that women rarely interact with their mother's booklet or antenatal care records, which contain important information on danger signs and birth preparedness. Most women keep their books or records stored away in a bag or closet and do not actively engage with the content. Women reported that the book is mostly for the healthcare provider to track clinical outcomes, rather than as a support or educational tool for the pregnant woman to engage with. The main design goal for the Pregnancy Purse (Fig. 2) was therefore to develop a more engaging set of materials of primary interest to the woman, to foster her curiosity about pregnancy and childbirth, and to develop an understanding of the upcoming journey and milestones throughout her pregnancy and childbirth. The engaging format was co-designed with women and community members to encourage women to read and use the information in the materials.

Additionally, the design research revealed that women had many basic questions related to pregnancy and childbirth and how to prepare and respond to danger or risk signs. The lack of accessible and easy to read information led the team to develop formats that could make information more visible within their home environment and clearer to act upon. The Pregnancy Purse is therefore designed as a folder containing interactive materials for women and their companions to

provide information during pregnancy and prepare them for childbirth. We envision the Pregnancy Purse to be distributed by a midwife or nurse during the first antenatal care visit. The purse can be placed visibly in the home as a stand or it can be hung on the wall. It has handles

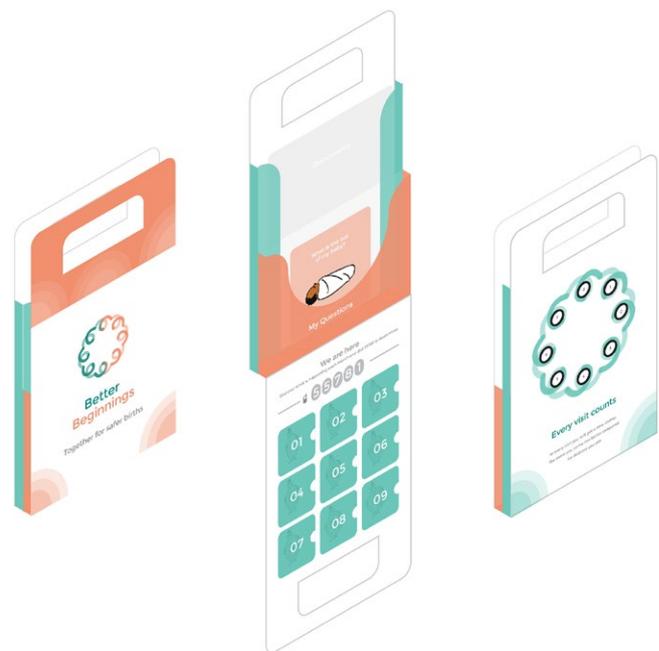


FIGURE 2 Pregnancy Purse: The illustration on the left shows the front of the purse. The center image shows the open purse with the compartment for any documents, a holder for the question cards, and the calendar at the bottom. The image on the right depicts the reverse aspect, with the tracker for antenatal care visits.

for carrying and the size is designed to fit into a woman's handbag, which was communicated as an important requirement by the women participating during the design process. It has four main characteristics: (1) a visual tracker to record antenatal care visits; (2) a safe place to protect the woman's antenatal care records, mother's book, and other documents; (3) storage for a series of cards with commonly asked questions; and (4) a pregnancy calendar to visualize the stages of pregnancy.

Visual antenatal care tracker

The reverse of the Pregnancy Purse (Fig. 2) contains a circular visualization of the recommended antenatal care visits and encourages women to complete all visits and mark these on the purse. Insights from the co-design workshops and design research revealed that many women did not know why several antenatal care visits are needed and how they are connected. The circle communicates clearly that each visit is an important part of the pregnancy journey. The number of visits can be adjusted to reflect guideline recommendations. The tracker is also a helpful tool for the midwife at the antenatal care visit or in the facility to understand how many visits a pregnant woman has attended and what information she may need.

Document holder

The Pregnancy Purse contains a compartment to hold the mother's book or other important information. This is to help keep all information in one place. It can also hold existing documents provided locally, such as the mother's book that is already provided in Uganda.

Question cards

The question cards (Fig. 3) are highly visual information cards containing answers to common queries women have expressed during pregnancy and childbirth together with recommended behaviors and actions. The full set of cards could be located at the antenatal care clinic. During an antenatal care visit, the woman can choose from a variety of cards depending on which questions are specific to the woman's context and condition. The cards, which can be collected and placed in the Pregnancy Purse, emphasize the message that each pregnancy and childbirth is different and each pregnant woman has her individual questions and needs.

The questions and answers shown on the question cards were developed through workshops and interviews with women, where the design team identified that women have many unanswered questions



FIGURE 3 Example cards from the Pregnancy Purse. The questions on the cards are written in the first person and the answers in the second person to represent a dialogue between the pregnant woman and the healthcare providers.

about basic information related to pregnancy, well-being, and child-birth. Women reported that they lack opportunities to ask questions and often do not understand the medical jargon used during antenatal care visits. The design team therefore aimed to use the words and phrases that the communities themselves use and provide medical explanations in a simple way (Fig. 3). The wording, amount of information, graphics, and the typography are all designed to be easily understandable. The cards include contact information for an Interactive Voice Response (IVR) service, to provide women with low literacy skills access to the same information as women with high literacy levels.

Pregnancy calendar

The pregnancy calendar offers an engaging way to understand the duration of pregnancy, and provides interesting facts related to fetal development. It communicates to women how their baby is developing and growing in a highly visual form. The calendar aims to foster curiosity in the woman and her family to learn more about pregnancy and childbirth. The calendar has nine flaps, one flap for each month of pregnancy. By opening a flap, the woman can discover an illustration of the growing baby accompanied by an interesting fact about the baby's development. For each illustration there is one code, which can be used to obtain more information through dialing into an IVR service through a mobile phone. This is particularly relevant for women with low literacy skills.

The insights from the design research revealed that women often did not understand the physiology of their own pregnant body and how different behavior and actions—such as talking or singing to the baby, resting enough, and regular exercise—can have an influence on the baby. During the co-design sessions, women, together with the design team, developed the idea of a pregnancy calendar. The research team observed that they engaged with great joy and curiosity in the discovery of information related to fetal development. In service design, designers aim to create positive experiences to enable environments for learning. The playfulness of the calendar aims to create an environment for positive experiences and behaviors, both prospectively and (where women come to the service late in pregnancy) retrospectively.

3.3.2 | The Birth Board

The Birth Board (Fig. 4) was designed to support communication and expectation management during labor and childbirth. Expectation management refers to activities that support the understanding of childbirth in the facility and the setting of realistic expectations. Midwives conveyed during the interviews the challenges they face with communicating with women with different dialects or languages. Midwives agreed that providing information about birth preparedness and the childbirth process should be given during antenatal care; however, women reported that midwives at antenatal care would not have enough time to answer their questions and talk about the childbirth journey in a way that would be easy to understand.

The Birth Board contains images of cervical dilation, the baby's condition, and the woman's path through the health facility from admission to labor to childbirth and postpartum. It also contains recommendations that may encourage the woman's autonomy and

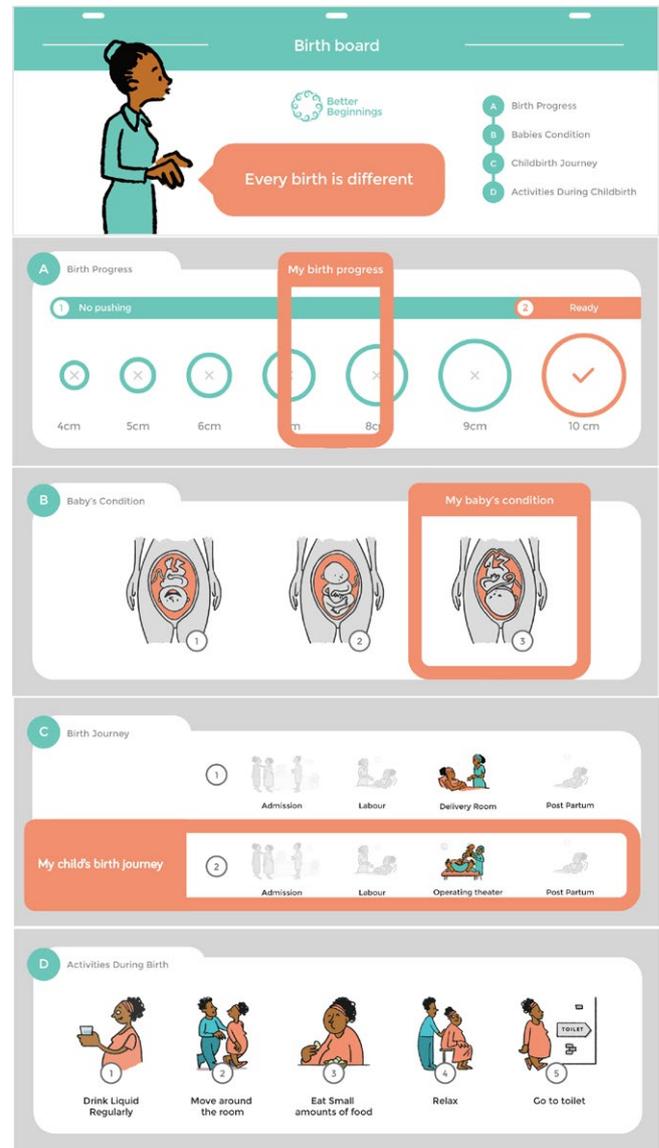


FIGURE 4 Birth Board: The tool is designed to be interactive and has movable indicators that can slide along the childbirth journey. They can also be placed in one area as a focus for discussion.

control over her childbirth experience. The intention is that women will be able to understand what to expect as they move through the labor and childbirth process. The Birth Board also encourages them to express any concerns they might have. The tool reinforces the message—similar to the question cards—that each birth is different and each woman has unique needs.

The Birth Board is therefore designed as a preparation and communication tool used by a nurse or midwife in the counseling session during antenatal care, as well as during labor and childbirth, to better convey the process of childbirth. It can also be used by the health-care provider to communicate current or potential conditions that may occur during labor, and care procedures that might be offered, in a simple, visual, and easy to understand form. The tool could support the woman to gain a better understanding of the overall childbirth process, and enable her to set expectations for quality of care.

3.3.3 | The Family Pass

The Family Pass (Fig. 5) was designed in response to several findings. Healthcare providers working in busy hospitals expressed the need to better prioritize women when they arrive and need to be assessed. They wanted to remember their names over the time of their stay, and to be able to clearly identify their key support person. Both healthcare providers and support persons repeatedly expressed a concern that support persons in the facility would not know how to be helpful to the woman throughout labor and how they could emotionally support her. Women expressed the need to better understand when they should expect providers to check on them, when to call for help, how their labor is progressing, and how to better manage the pain through coping mechanisms. In addition, women reported that upon arrival to the facility they rarely felt welcomed, and that they were a legitimate customer of the facility.

These insights led to the design of visible wearable passes that allow easy recognition of roles and names, and records of key information for easy access and follow-up, as well as management of expectations of the pregnant woman and her support person. Similar to an entrance ticket to a theater or a boarding pass to an airplane, the Family Pass is designed to be a visual evidence for the woman, her

birth companion, and the healthcare provider about the service that is to be delivered and received, and about her preferences for care. It is comprised of wearable passes for the woman and her companion. It is intended that both the woman and her supporter would wear the pass visibly at all times during their stay at the facility.

The pass for the woman contains basic personal information and her supporter's contact information, as well as pregnancy-related information including her arrival time, personal preferences, and the status of her labor progress. The information on the woman's pass is designed to support the health providers to gain a quick overview for decision-making and reacting quickly, while taking into consideration the unique needs and preferences of each woman. For the pregnant woman, the pass is meant to be a tool to follow up on her own care journey and encourage her to express her needs. With the help of the visible arrival and admission time, she and her support person can follow up that she is assessed and cared for in a timely manner.

The Supporter Pass enables the woman's partner, family member, or friend to be a recognized birth supporter in the facility and offers guidance on how to support and take part in the birth process in a way that improves the woman's experience. The supporter pass is envisioned to make it easier for the health provider to identify or call him or her when needed. In addition, the pass gives the support person key information on how to support the pregnant woman during the birth process.

FIGURE 5 Family Pass: The pass for the woman and the pass for the supporter with front and reverse aspects.

4 | DISCUSSION

4.1 | Accessibility, communication, and knowledge acquisition

Selecting the content and the format for the service solutions was an iterative process. The content was tested with different prototypes that were presented to women and other community groups. It takes into consideration the rural and urban environments across the co-design and testing sites in Akure and Abuja in Nigeria, and in Kampala and Bududa in Uganda.

The three tools all convey a unified coherent narrative; they are connected in one visual and consistent style to allow the woman to learn, recognize, and reinforce the same information at different moments throughout her journey. For example, the way that cervical dilation is depicted in the Family Pass is similar in color and shape to the way it is represented in the Birth Board. Similarly, the PSB tools all share key underlying principles that guided the design of the tools: accessibility, communication, and knowledge acquisition.

Compatibility with the current workflows in facilities was also an important design consideration. The tools were tested with different healthcare providers during diverse workflows in primary health centers, district hospitals, and tertiary referral hospitals and district hospitals. For example, during the design of the Birth Board, testing and discussion with healthcare providers revealed that the tool would be valuable both during antenatal care as well as labor.

The materials used for the tools take into account resource availability and local production possibilities. During the design process, the team proposed several formats for each solution, to evaluate the

possible production methods that could be easily found in different parts of Uganda and Nigeria. The Pregnancy Purse, for example, uses a hole punch and normal metal rings that are widely available and used in folders. For the Birth Board, long-lasting materials such as plastic were chosen, as the tool will be used primarily in clinical context and needs to be cleaned and sustained for longer times.

During the design research the team realized that the gap in access to information is often remarkable, due to different levels of educational attainment and other sociodemographic and economic determinants. Women have different levels of literacy and often may not share the same language with the healthcare provider. The design team took the various levels of access to information into account in the design in various ways, including defining the narrative based on the woman's own storytelling, developing the visual communication style, vocabulary and tone of voice, and selecting inexpensive formats.

Enhancing communication between women and healthcare providers was another guiding principle. It was important to use mutually understood signs and semiotic rules, which were iterated in the field to reassure that healthcare providers, women, and supporters understood them. Knowledge acquisition is enabled through active engagement with information, repeat delivery of the same message, and opportunities to engage in a dialogue about the information. The tools use an accessible format and can act as a trigger for conversation at different moments of the woman's journey (at home, at antenatal care, in the facility).

The next step in the development of the service concept is to translate the tools into local languages and pilot test and evaluate them in facilities in Uganda and Nigeria. Through this process, new insights will emerge that will need to be incorporated into the design solutions. Testing the tools in different contexts such as rural and urban, and high- and low-volume facilities will also yield insights on needs for adaptation. Design researchers and designers will be part of the process to ensure that the final solutions are aligned with the results of the design process. To assess whether women's understanding and experiences of childbirth have improved through use of the tools, a comparative study of sites where tools are implemented versus not should be conducted. Knowledge acquisition and a better preparedness for birth could be measured with both qualitative and quantitative indicators such as numbers of antenatal care visits per woman, numbers of antenatal care visits among a certain age group, and level of preparedness for delivery.

One hypothesis is that antenatal care visits could increase in sites where the tool is implemented, and qualitative interviews at antenatal care with healthcare providers and women could assess the obtained knowledge and level of preparedness for birth. In addition, the number of calls and details about which content has been most accessed in the IVR system will yield results on the attractiveness of the audio content, the ease of use, and the content provided. Healthcare providers can also be interviewed on their experiences with women before and after introducing the tools. Women's experience of birth can be quantitatively and qualitatively captured after birth through exit interviews and use of the same IVR tool as a post-service client survey.

4.2 | Conclusions

This paper describes the PSB service concept and tools developed as part of the BOLD project. The PSB service concept is an implementation tool to concretize the effective behaviors developed in the negotiated standards of care, to facilitate positive interactions between healthcare providers, women, and their families. Three Better Beginnings tools were developed through the service design process: (1) the Pregnancy Purse; (2) the Birth Board; and (3) the Family Pass. These tools are designed to provide positive messaging about health and well-being, encourage the woman to have a seamless journey throughout maternity services, and enable the sharing of information between healthcare providers, women, and their families. Ultimately, the PSB service concept and tools aim to enable the woman's options and decisions to be documented, recognized, and mutually agreed and acted upon by all concerned.

AUTHOR CONTRIBUTIONS

This article was conceived by MS, MW, and DR. All authors contributed to the content and development of the article. All authors reviewed and agreed to the final version of this manuscript.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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