The applications of digital health in obstetric care: impacts and perspectives that go beyond the COVID-19 pandemics

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ABSTRACT: Introduction: The women’s welfare, as viewed as a whole in women’s healthcare, may be exemplified as obstetric and prenatal care, which is based on the access to health services and good quality information. Those factors enlarge women’s empowerment, decrease pregnancy complications and maternal-fetal mortality rate. Many informatized systems have been driven by COVID-19 pandemics and have become an ally in women’s healthcare and in pregnancy development, in which telemedicine and mobile health apps have been made important pillars on e-Health to facilitating doctor-patient relationship. Objective: To evaluate in the literature about the impacts of digital health system implementation and pregnancy healthcare during prenatal care and validation of pregnant women information. Methods: It was used the database of PubMed, SciELO, Google Scholar and BVS between the period of 2016 and 2021, using Portuguese and English descriptors, including meta-analysis, prospective and retrospective cohorts, as well as case reports. Results: There were 13 selected articles that represent the theme of obstetric healthcare, prenatal care related to digital information and validation of pregnancy data reporting. Analyzed under the perspective of three main areas involved in digital health applications related to obstetric care, they were related to a better pregnancy healthcare and to women’s empowerment tool. Discussion: The pregnancy information validity constitutes a building up public policy tool and empowers epidemiological research. The quality of this information and the active pregnancy participation are essential pillars to promote mother-child health. Besides that, educational healthcare apps have been made one of the informatized ways by which telemedicine has become popular among patients, it has been included as an intervention way in the doctor-patient relationship. Therefore, healthcare obstetrics tools such as prenatal care has been made easily accessed and diversified through e-Health, even though during these pandemic times. Finally, the birth plan has become an efficacious tool in the prenatal care, in which it has made available a better communication between the pregnant woman and its medical team, family, friends and people around her, it represents their preferences concerning the birth time, in which it makes it an humanized delivery. Conclusion: Through the analysis of the articles it was found that the obstetric health information technology allows an integral and closer care through mobile applications, in which they have improved and diminished healthcare access barriers. Those tools allied to a consolidated and informatized birth plan, plus the fact of sharing educational resources, they potentiate women’s decision-making process.

KEYWORDS: Obstetrics; Digital health; Pandemic.

RESUMO: Introdução: O bem-estar da mulher, em uma visão integral do cuidado à saúde feminina, exemplificado pelo cuidado obstétrico e atenção pré-natal, se ressalta no acesso aos serviços de saúde e a informação de qualidade. Esses fatores aumentam o empoderamento feminino, reduzem as complicações e os índices de mortalidade materno-fetais. Impulsionados pelo período de pandemia COVID-19, diversos sistemas informatizados têm se tornado aliados no cuidado à saúde da mulher e ao desenvolvimento da gestação, sendo a telemedicina e os aplicativos em saúde pilares importantes da e-Saúde que facilitam a interface médico-gestante. Objetivo: Levantar evidências na literatura sobre os impactos das implementações de tecnologias digitais na saúde e atenção à gestante durante o cuidado pré-natal e a validação da informação gerada pela gestante. Método: Foram utilizadas as bases de dados PubMed, SciELO, Google Scholar e BVS no período de 2016 a 2021, com descritores em português e inglês, incluindo artigos de revisão, meta-análises, coortes prospectivas e retrospectivas, assim como os relatos de caso. Resultado: Foram selecionados 13 artigos representando os temas da atenção à gestante, cuidados pré-natal relacionados às tecnologias digitais e validação da informação da usuária. Analisados sob a perspectiva de três grandes áreas envolvidas na aplicação da saúde digital ao cuidado obstétrico, resultaram em uma relação de maior cuidado à saúde da gestante, além de disponibilizar ferramentas de empoderamento feminino. Discussão: A validação da informação da gestante constitui uma ferramenta de fomento às políticas públicas e pesquisas epidemiológicas. A qualidade dessa informação e a participação ativa da gestante são pilares importantes para a promoção de saúde materna-infantil. Ademais, aplicativos educativos em saúde têm sido uma das formas informatizadas pela qual a telemedicina se populariza dentre os pacientes, inclusive como meio interlocionista nas relações médico-paciente. Assim, ferramentas de saúde obstétrica como o pré-natal se tornaram mais acessíveis e diversificadas, mesmo em um período de pandemia, por meio da e-Saúde. Por fim, o plano de parto mostra-se uma ferramenta eficaz no pré-natal, facilitando a comunicação da gestante com a equipe médica, familiares e amigos, acerca das suas preferências quanto ao processo de parto, estimulando a mulher a ser protagonista de seu parto, humanizando-o. Conclusão: A análise das publicações avaliadas aponta que as tecnologias de informação na área de saúde obstétrica permitem um cuidado integral e próximo por meios eletrônicos como aplicativos digitais, melhorando a atenção e diminuindo barreiras de acesso aos serviços de saúde. Aliadas a um plano de parto consolidado e informatizado, além de partilharem conteúdos educativos, essas ferramentas ainda potencializam o poder de decisão feminino.

PALAVRAS-CHAVE: Obstetrícia; Saúde digital; Pandemia.
INTRODUCTION

Historically, the understanding of the states involved in health-disease processes has undergone modifications, in line with social and scientific evolution. Contrary to the view centered on disease control, a broad debate on new determinants of human health was instigated worldwide in the 1960s. This formalized movements that converged in the resignification of health, such as the Alma-Ata Conference and the family health strategy. World Health Day (April 7, 1948) was marked by the establishment of the global right to health and the role of the State in providing health promotion and protection.

At the International Conference on Primary Health Care, WHO recognized: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity - is a fundamental right, and the attainment of the highest possible level of health is the most important worldwide social goal, whose realization requires the action of many other social and economic sectors in addition to the health sector”¹.

The technical perspective of health gradually underwent a process of humanization. The care of special segments of the population accompanied this transformation. The maternal-child programs in force until the 1970s reflected the strict view of women’s health with a focus on the pregnancy-postpartum cycle, disregarding important aspects of women’s well-being. Still on the rise, comprehensive care for women’s health was inaugurated in the Comprehensive Women’s Health Assistance Program, elaborated in 1984 by the Ministry of Health¹²,³,⁴,⁵.

Notably, attention to women, mainly in the obstetric field - given the enormous complexity of the gestational, prenatal and postpartum periods - became the focus of debates on the humanization of medicine⁶. In conformity with the principles of the Unified Health System (SUS) and the new ideals of medicine, prenatal care has proven to be an important tool for health promotion, disease prevention, and education, which justifies the impulses of the governmental sphere to guarantee the expansion of access and quality of care.

The Ministry of Health (MS) instituted, in 2000, the Humanization Program in Prenatal and Birth (PHPN) in SUS, aiming to develop actions for the promotion, prevention, and assistance of pregnant women and newborns’ health. Among these actions, those focused on prenatal care have shown enormous impact on maternal and neonatal health, resulting in increased access to quality information and female empowerment, reduced rates of cesarean delivery, and maternal mortality⁷.

Around 10% of Brazilian pregnant women had no prenatal care coverage in Brazil in 1995. In 2015, 2.2% of pregnant women were not benefited from prenatal care, according to data from the Live Births Information System (Sinasc)⁸. From this perspective, it can be noted that there are still obstacles to the full care of pregnant women. Procedures for the prevention of nutritional deficiencies, vaccinations, and the frequency of recommended prenatal consultations are some deficient points in public attention to Brazilian pregnant women. For pregnant women living in rural areas, such gaps are even more relevant, leading to inadequate family care⁹.

As a way to mitigate geographic barriers and other situations that make it impossible for pregnant women to attend in-person appointments (such as the necessary social isolation during the COVID-19 pandemic), computerized tools have emerged in the e-Health scenario with the aim of disseminating health education, answering questions, improving the relationship between the family and the health team, and ensuring the bond between women and healthcare services. E-Health, considered a worldwide health information strategy and policy, seeks to adopt technologies to improve individuals’ global well-being and health, implementing concepts such as the Internet of Things, Artificial Intelligence, Big Data, and Data Analysis¹⁰.

An important pillar of e-Health is the telemedicine. During the COVID-19 pandemic, telemedicine grew exponentially and gained prominence. Regulated in Brazil, it provides remote health care services, allowing medical assistance. Cybermedicine aims to study the relationship between health and the internet, aiming to integrate new technologies, such as smartphone apps, into human health under the name of e-health. Computerized resources compose the object of study of health informatics, an interdisciplinary area that aims to expand access to primary and secondary care through information and communication technologies¹⁰.

Digital inclusion proves to be a promising tool for prenatal care, contributing to essential processes for women’s health and pregnancy development. Positive points highlight computerized tools, including data generation for effective public policies, the popularization of access to prenatal care, maternal empowerment through education, and the prevention of maternal and fetal harm¹⁰. The democratization of information and digital inclusion facilitates the widespread use of tools that bring benefits and promote equal and universal autonomy among users¹⁰.

OBJECTIVE

To gather scientific evidence in the literature about the impacts of the implementation of digital technologies on health promotion and prenatal care, as well as the validation of information generated by pregnant women.

METHODS

For this review, the databases PubMed, SciELO,
and Google Scholar, and BVS were used in the period from 2016 to 2021, with descriptors in Portuguese and English. A search was made for original articles, descriptive and experimental studies, review articles including meta-analyses, prospective and retrospective cohorts, as well as case reports. The keywords used for the search were “Pandemic”/“Prenatal”/“Virtual”/“Tele health”/“Telemedicine”/“Pré-natal”/“distancing”/“Pand emia”/“COVID-19”/“Telemedicina”/“Distanciamento”. Articles that mentioned the relationship between health informatization and prenatal aspects were prioritized as inclusion criteria.

According to the methodology, the articles were selected based on the objective, respecting the inclusion criteria and proximity to current times. Thus, articles prior to 2016 were excluded. In total, 13 articles were selected, all representative of the theme of attention to pregnant women, prenatal care related to digital technologies, and validation of user information. As shown in Table 1, the studies were divided by author, year, study type, and objective.

### RESULTS

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<table>
<thead>
<tr>
<th>Authors/year</th>
<th>Type of Study</th>
<th>Main aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chang et al., 2018</td>
<td>Cross-sectional population</td>
<td>To evaluate whether the extent of the recall period of newborn weight and gestational age measures reported by mothers affects the classification of the neonate as low birth weight or preterm.</td>
</tr>
<tr>
<td>McCarthy et al., 2016</td>
<td>Observational longitudinal</td>
<td>To evaluate how accurate is maternal reporting regarding interventions on the newborn that occurred during the intrapartum and immediate postpartum periods. We also examined the extent to which there is a deterioration of this memory and how much it compromises the validity of maternal reporting. In addition, we surveyed the factors that influence maternal ability to report events related to childbirth.</td>
</tr>
</tbody>
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Source: authors

Figure 1 - Flowchart of the addressed articles

![Flowchart of the addressed articles](image-url)
Prospective Main aspects

Collect evaluations for mobile apps designed for pregnant women

Type of Study

Narrative review

Descriptive

Prospective

Prospective

Prospective

Prospective

Prospective

Randomized controlled trial (doctoral thesis)

Descriptive

Prospective

Prospective

Prospective

Prospective

Prospective

Prospective

Descriptive

Prospective

Prospective

Prospective

Prospective

Prospective

Literature review

Literature review

Literature review

Literature review

The applications of digital health in obstetric care: impacts and perspectives that go beyond.

The gestational period is of great importance in a woman’s life. Divided into prenatal, childbirth, and postpartum, it consists of many intrinsic aspects of the moment. Attention to the health of the mother and child is essential and needs to encompass and care for all these aspects, with the aim of promoting maternal-fetal well-being and reducing the possibility of gestational complications. However, there are obstacles to obstetric support, resulting from factors such as the fragmentation
of health systems and reduced access to services. In addition, there is a loss in generating information that contributes to the implementation of effective health programs based on epidemiological research. In countries with high rural demographics, such as Nepal, where many births occur at home, the problem becomes more serious: low birth weight is common, as well as the occurrence of cerebral palsy, and lack of access to support services for pregnant women culminate in complications related to pregnancy and childbirth and contribute to the lack of reliable data that could underpin public policies. Thus, maternal reporting parameters may underestimate and bias the rates of low birth weight and preterm births, especially in locations with a high prevalence of low birth weight and premature births.

The reliability of the information provided by pregnant women is influenced by their memory. Therefore, there is concern regarding the moment when maternal recollection is needed and the accuracy of the experience report. Overall, there is not a significant deterioration in the ability to recall maternal aspects and interventions in the newborn with accuracy by mothers, but there is a moment in which this report can be affected, especially when related to physical and emotional turbulence, such as that which occurs at the beginning of labor and in immediate postnatal care (both maternal and neonatal).

The quality of information provided by pregnant women is not the only important aspect in prenatal care, but their active participation also has an impact on the course of pregnancy. With the creation of validated monitors for blood pressure measurements, there is greater access to reliable tools and therefore greater reliability in the generated data. It is recommended by the WHO that pregnant women have constant home monitoring of their blood pressure in order to maintain their own records to improve continuity and quality of care. Therefore, the impact of pregnancy and fetal outcomes shows that the self-monitoring group experienced a significant difference in higher probabilities of spontaneous delivery and lower probability of induction of labor compared to the group that did not have self-monitoring. However, this approach cannot be generalized to all comorbidities, as other comorbidities such as gestational diabetes did not benefit in the same way, demonstrating that self-monitoring tools have limited impacts on maternal health outcomes. Additionally, there are several barriers that influence the adoption of this measure, ranging from financial limitations to limitations in human resources, including costs, equipment availability, lack of compensation for health professionals for guidance, among others.

Another aspect of great relevance regarding the evaluation of the quality of information generated by pregnant women is the socioeconomic factor. Regions with higher educational indices, private services, greater access to information, and higher economic indices presented better results for the validation of anthropometric variables, as evaluated in the accuracy of pre-pregnancy weight, height, pre-pregnancy BMI, and weight at the last prenatal consultation reported by women. In this sense, BMI is considered one of the most relevant indicators for monitoring the nutritional status of pregnant women, as recommended by the Institute of Medicine, which also considers the index to support guidelines in pregnant women. To validate this information, women who had the gestational card, from which reference values (gold standard) were obtained for the variables: pre-pregnancy weight in kilograms (kg), height in centimeters (cm), weight at the last consultation (kg), and pre-pregnancy BMI obtained through the formula [pre-pregnancy weight (kg) / height² (m²)], were considered eligible, comparing this data with data collected in face-to-face interviews with postpartum women during hospitalization.

### Aplicativos Atuantes no Processo de Informação em Saúde

The COVID-19 pandemic has brought technological changes and new ways of interaction among people. This is no different in obstetrics and care for pregnant women. Several changes have influenced the doctor-patient contact, creating a more computerized world and other ways of social interactions, mainly through new means of communication, with emphasis on the empowering action of the internet. In addition, it is notable the possibility of adopting alternative plans using telemedicine as a modern and intervention tool in doctor-patient relationships. Regarding women’s care, obstetrics has become able to reinvent certain stages of prenatal care, which have not changed since the 1930s. These factors have initiated discussions about the necessary number of prenatal visits and the use of computerized tools as support to ensure the satisfaction of pregnant women, as well as the reduction of risks and pregnancy-related complications.

The fundamental nature of prenatal care is indisputable. It allows for the execution of actions related to the promotion, prevention, and assistance of the health of pregnant women and newborns, in accordance with the Programa de Humanização no Pré-Natal e Nascimento (PHPN), which was implemented within the scope of the Unified Health System (SUS) in June 2000. The PHPN established minimum care practices for the moments before and after childbirth, such as early detection of pregnancy (up to 120 days from the date of the last menstrual period); at least six follow-up consultations, preferably one in the first trimester, two in the second, and three in the third trimester of pregnancy, and one postpartum consultation (up to 42 days after delivery); educational activities, among others. It is essential to remember these concepts in the current scenario, since the advent of health...
computerization creates flexible tools, accompanied by an anticipatory guide and psychosocial support, which allow pregnant women to shape their remote and face-to-face care according to their needs. There are plans that address the theme of “4-1-4,” which consists of 4 live visits, 1 ultrasound, and 4 virtual visits. The idea of flexibilizing the number of prenatal visits through remote support aims to promote greater convenience for pregnant women, but above all, it aims to make greater availability of face-to-face attention possible for pregnant women who are at high risk and require closer and in-person monitoring.

Another adopted approach is the universalization of access to education related to care practices for pregnant women, as well as information about the process of pregnancy and the moments of prenatal, childbirth, and postpartum, through computerized tools. As a result, pregnant women become protagonists in decisions related to childbirth, as well as acquiring knowledge. Virtual prenatal models have the potential to promote an educational environment in content and personalized by low-risk pregnant women in order to increase adherence to prenatal care by reducing the need for live visits, encouraging self-monitoring.

The Babyscripts application illustrates this proposal, as it provides educational content through a mobile app and allows remote monitoring of blood pressure and weight by the pregnant woman herself, thus avoiding low-need obstetrician visits, optimizing time and facilitating the life of the pregnant woman. A controlled study compared the satisfaction of pregnant women from the separation into two groups: the first in usual prenatal care and the second in reduced in-person visits to the health service, but with the use of a prenatal care app for smartphones. The women selected to compose the groups were between 18 and 40 years old, had a desired pregnancy, not considered high risk, and regularly used an Android or iOS smartphone. Among the 88 patients chosen in an academic center in Washington, DC, United States, 47 were submitted to the experiment and 41 formed the control group. For the experimental group, the average number of obstetric consultations during pregnancy was 7.8, while for the control group, the average was 10.2. There was no statistically significant difference in the satisfaction of women in the two groups.

In addition, another relevant aspect regarding the use of computerized tools for prenatal care is the increase in adherence rates to appointments. It is well known that low adherence of pregnant women to prenatal care makes it difficult to detect and manage complications of the pregnancy and postpartum period, which is reflected statistically in maternal mortality. With the aim of reducing negative outcomes during pregnancy, the World Health Organization (WHO) proposed, as a recommendation to improve the quality of prenatal care, increasing the number of appointments, raising the minimum number to eight. Similarly, it is of great importance to ensure that the core of prenatal care is based on the principles of care, education, and counseling.

Telemedicine helps improve low-complexity obstetric care for the pre- and postnatal periods, as it provides support for healthcare professionals in rural regions, and this tool influences patient satisfaction with care. No significant risks were observed for the mother or fetus with a reduction from 14 to 9 prenatal visits with interspersed virtual visits from advanced practice nursing. During these visits, patients were instructed to measure blood pressure and use handheld fetal Doppler to monitor pregnancy progress. However, there are some complicating factors, such as difficulty of access and quality of connection, and the selection of the videoconferencing platform is crucial for overall patient and family satisfaction with the ease of use of the applications.

From this perspective, technological and computerized tools, when applied to the health sector, are allies of healthcare professionals. They prove to be effective when promoting health and preventing health problems, as exemplified by the Healthy Pregnancy app, which aims to increase adherence to prenatal visits. The main idea of the apps is to supplement the health services offered in the network, rather than replace them. Therefore, the goal of this particular app is to be associated with monthly check-ups, presenting a significant improvement in prenatal care adherence.

Another important communication channel is the “Meu pré-natal” app, which was developed with an educational purpose to support women during pregnancy, childbirth, and postpartum. A user interface marker is the gestogram (a tool that calculates the chronology of pregnancy), whose importance is justified by the enormous relevance of neonatal death as an outcome of premature births. The calculation of the probable date of delivery is the reference for scheduling the ideal date for birth, calculated from the date of the last menstrual period reported by the pregnant woman and the first-trimester ultrasound. From this date, the calculation of gestational age in completed weeks and days is made. In addition to this estimate, the pregnant woman has access to specific knowledge related to pregnancy, caring for her health and the newborn in easy language, becoming the protagonist of her pregnancy. The impact observed in society was rapid, with the popularization of the app in several countries, demonstrating the importance of this communication channel for health education proposals. At that time, it was difficult to infer about educational interventions such as guiding the search for maternity care, or alerts for abnormalities or even if the photo album interfered in the couple’s experience, given that the app had been available on the market for a short time.

The proposal to recruit pregnant women with...
harmful behaviors to encourage the abandonment of habits such as smoking, alcohol consumption, and excessive weight gain has not yet established efficacy. However, the use of an application with this purpose, “myHealthyPregnancy,” for assessing patients’ risks of preterm birth and subsequent communication of risks to them, had a qualitatively greater impact on pregnant women in terms of satisfaction, as they had more prenatal consultations and even increased intention of breastfeeding with greater attendance21,26.

The High Risk Pregnancy Program offers a website with guidelines for routine and complicated obstetric and neonatal topics, a center to provide patient support, 24-hour access to maternal-fetal medications, and education consultations to improve the readiness of rural professionals to manage emergencies. A recent patient survey of the High Risk Pregnancy Program observed a satisfaction rate of 98.8% and 95% and indicated that they would use the service in the future. Furthermore, providers who utilized the service noted greater access to care (97.1%), improvements in patient’s lives (92.5%), and that the system is “excellent” (98.5%)27,28,29,30.

The Birth Plan as a Tool in Prenatal Care

The strategy of using the Birth Plan (BP) emphasizes the woman’s participation in childbirth, which is a document or form in which the expectations and preferences of the pregnant woman regarding childbirth procedures are described. Introduced in the early 1980s in the United States, the BP has been recommended by the WHO since 1996, and since then Brazilian entities have been working to include it in legislation.

Through this tool, the pregnant woman can register her preferences and they are shared with the medical team, family, and friends. Evaluating the data from the PP helps healthcare professionals in clinical decision making and facilitates greater satisfaction for the pregnant woman regarding her childbirth experience. Based on the analysis of various characteristics of a sample of PP, there are some preferences among pregnant women regarding childbirth: “vaginal” delivery is the preferred delivery route; age and number of previous pregnancies are related to the chosen delivery route; most pregnant women want to breastfeed their child in the first moment after the baby’s birth; most want to have a companion present during delivery; just over half of pregnant women want anesthesia; the majority do not want an episiotomy. Other attributes have also been explored in the PP, such as pain management during childbirth.

With the evolution of technology and computerization, applications have been adapting the Birth Plan (PP) for virtual platforms and promoting its use. Thus, in addition to being a way to document the desires of pregnant women, the PP also serves as a tool for generating data in the healthcare field, aiding in the construction of a collection of structured medical information for research and other purposes, proving that information sources have potential to be useful and usable for clinical practice, as well as serving as evidence and tracking for the advancement of medicine20,31.

Interoperability has the characteristic of exchanging information between systems, facilitating both the patient experience and the function of primary care in managing levels of care. The Electronic Health Record (EHR), as a repository of health information, becomes capable of being processed, retrieved, recorded, and manipulated electronically when included in a system, the Electronic Health Record System (EHR-S), storing patient information and enabling the exchange of such information among the different components forming the health system. Similarly, the PP can be accessed from different platforms, ensuring access by other professionals to the pregnant woman’s demands and preferences, regardless of the location of her care or delivery, and her longitudinal care provided from prenatal care to the postpartum period.

Furthermore, the need for an interdisciplinary team is considered essential, where the medical-scientific basis is provided by the healthcare professional, while the technical knowledge and digital apparatus modeling demand fall within the scope of computer science. In addition to these skills, there is the delineation of platforms, structuring and development of applications, which are the responsibility of design teams and potentially the area of program architecture. Other professionals are also important, depending on the characteristics of the various projects.

The use of health information technologies becomes an ally in the strategy to improve the quality of care offered to pregnant women, ensuring their registration, integral and continuous care, approximation between primary care and maternity, promotion of educational actions, encouragement of good practices in childbirth and obstetric clinical error reduction. In addition, stimulating the direct participation of the pregnant woman in the decisions about her childbirth is one of the pillars of humanization of childbirth, making the woman the protagonist of her pregnancy moment. By involving family and people in contact with the pregnant woman, there is a greater overall satisfaction of the patient and her related ones, influencing the improvement of obstetric care.

The pregnant woman’s perception of the communicability of the birth plan on a digital platform was found to be positive, influencing the physician-patient interaction, reducing medicalization, and empowering the pregnant woman to participate in her own childbirth process. The early involvement of the
CONCLUSION

The analysis of the publications gathered in this review allows us to conclude that the application of information technologies to the field of obstetric health, especially in the support for pregnant women or mothers, promotes comprehensive and close care. Even by electronic means, digital health proves to be beneficial, especially in situations where there are barriers to physical access to health services. For years constrained by molds based on scientific knowledge, the birth plan, which in other times underwent only content updates, becomes modern and computerized. In addition to this tool, the emergence of educational and informative applications in the obstetric context aligns with good health practices and enhances women’s decision-making power.

Authors’ participation:
The research had the participation of Murilo Pissinati Perez as a moderator in the selection of articles and in the construction of objectives, methods, as well as in the writing of the discussion and carrying out of the article review. The participation of Nathália Cristian Ferreira de Oliveira, who contributed to the construction of the introduction, abstract, results, conclusion, and formatting of the edition. In addition to the guidance and final review by Zilma Silveira Nogueira Reis.

REFERENCES


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