


TRENDS IN THE PRODUCTION OF KNOWLEDGE ABOUT AUDIOVISUAL EDUCATIONAL TECHNOLOGIES FOR PREGNANT WOMEN

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ABSTRACT

Despite the improvements in the health sector in recent decades, studies still show important numbers of maternal deaths related to avoidable causes related to pregnancy, childbirth and puerperium. The objective of this study is to identify the trend of theses and dissertations available in the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel on audiovisual educational technologies for pregnant women in prenatal care. This is a documentary, descriptive and exploratory study, using as a search strategy the combination of the terms "educational technology" AND gestation OR audiovisual OR video. After applying the inclusion and exclusion criteria, the research corpus was composed of seven studies, three theses and four dissertations. The studies show concern with emerging themes related to humanized childbirth and prevention of obstetric violence. The development of educational technologies involves important validation and evaluation processes. Two studies brought educational technologies aimed at health promotion in the face of hypertensive syndromes and for the context of oral health of pregnant women. In general, the population has been increasingly looking for quick information, with little reading and many visual resources, with emphasis on the reproduction of short videos that are on the rise on social networks today. It was considered that there is still a gap in the evaluation of educational technologies with a target audience in order to provide reliability and improve the use of the technology or product with specific audiences or from different contexts according to its proposition.

Keywords: Women's Health. Gestation. Educational technology. Video.

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INTRODUCTION

The reduction of maternal mortality represents a current and important challenge for health systems worldwide. This is a commitment that has been present on the agenda of the United Nations (UN) since the Millennium Development Goals (MDGs), which were in force from 2000 to 2015 (UN, 2015, Motta; Moreira, 2021) and in 2015, the new global agenda was ratified for the Sustainable Development Goals (SDGs). Among these goals, the reduction of maternal mortality was redefined as SDG Target 3.1, which aims to reduce the global maternal mortality rate to less than 70 deaths per 100,000 live births by 2030 (UN, 2015).

Despite improvements in the health sector in recent decades in relation to maternal mortality, data from 2017 show that approximately 810 women die per day in the world from causes considered preventable related to pregnancy and childbirth, with significant differences in rates between developed and developing countries (WHO, 2019). Among the causes of maternal death, in first place in Brazil are gestational hypertensive syndromes (GHS), which represent a set of clinical conditions that occur during pregnancy and the postpartum period, being the most prominent complications in this period. Among the main GHS are chronic arterial hypertension, preeclampsia, gestational hypertension and preeclampsia superimposed on chronic hypertension. These conditions can lead to deleterious maternal complications, such as liver, heart and kidney damage, in addition to significantly increasing the risks of placental abruption, premature birth and even maternal and fetal death. Therefore, it is considered that monitoring and proper management of hypertensive syndromes are essential to protect the health of the mother and baby (Brasil, 2022).

In this context, it is understood that it is crucial to qualify health services, especially integrating prenatal care and childbirth care for pregnant women, in addition to ensuring access to teams qualified to deal with obstetric emergencies, due to their avoidable nature. It is also recommended to increase the focus on conditions that pose risks during pregnancy, emphasizing the importance of educational and preventive health measures (Santos; Santos, 2023). When considering the context of maternal and neonatal mortality, which is a public health problem and a serious complication of labor and birth, the importance of good prenatal care and health promotion and education actions, planned from pregnancy, as effective preventive measures to face this problem is highlighted (Freitas *et al.*, 2024).

In the practice of popular health education, the use of educational technologies facilitates the consolidation of care, promoting the implementation of political-pedagogical

actions aimed at disease prevention, health promotion and recovery through the integration of multiple knowledge (Freitas *et al.*, 2024). Educational technologies are useful and significant tools in the teaching process in the context of nursing care, facilitating the development of health education and promoting knowledge and well-being to the population, giving them the ability to develop a critical awareness of their health-disease process (Nietsche, 2000).

Educational interventions that reach women in diverse social, economic, and demographic contexts offer numerous opportunities to translate necessary and accurate information. It is noteworthy that it is important to consider the use of audiovisual technologies in the face of the various contexts of the female population, such as illiterate or semi-illiterate women, in order to facilitate understanding of a given topic (Almeida *et al.*, 2022).

In view of the problem, the following guiding question is to review: what is the trend of knowledge production of theses and dissertations on audiovisual educational technologies for pregnant women in prenatal care? It is intended to meet the objective of identifying the trend of theses and dissertations available in the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (CAPES) on audiovisual educational technologies for pregnant women in prenatal care.

METHOD

This is a documentary, descriptive and exploratory study, carried out between June 20 and July 4, 2024 and updated in December 2024 based on the analysis of the productions (theses and dissertations) available in the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (CAPES). Documentary research is understood as the study based on primary documents, which support the object of study in question (Gil, 2010). The search was carried out *online*, using the strategy that combined the following exact and alternative descriptors associated with the Boolean operators AND and OR: "educational technology" AND gestation OR audiovisual OR video. The "Health Sciences" filter was applied in the Large Knowledge Area field. The inclusion criteria were: theses and dissertations that involved the theme of the use of educational technologies in video or audiovisual format for pregnant women in prenatal care. The exclusion criteria were: studies not found in full *online* after four search attempts, namely: in the CAPES thesis and dissertation database, in the depository library, in the Google tool, *and not released by the author after contact or without response. There was no time frame.*

The initial search resulted in 7039 productions, of which 610 were linked to the large area of Health Sciences, of these, 594 were not on the theme, six did not correspond to videos or audiovisual technologies, one did not correspond to the target audience and two were not found in full, after the attempts described above. The analysis of the documents began by extracting the information from each study, namely: title and year of defense, Higher Education Institution (HEI) and graduate program, method, type of technology and theoretical-methodological framework used. The results and discussions of each research were also thoroughly analyzed. It should be added that the quantitative data referring to the characterization of the documents were analyzed with absolute (n) and relative (%) frequencies, in addition, the qualitative results were grouped according to approximation and similarity, enabling the organization and presentation. Furthermore, these were discussed in the light of the literature related to the theme. As this is a documental analysis study, the approval of the Research Ethics Committee is waived, however, the ethical principles were respected, maintaining the veracity of the results and citation of authorship.

RESULTS

In total, seven studies were included to outline the *corpus* of the research. Chart 1 is presented below, containing the identification, titles, and type of studies that were analyzed in the present study. Then, it organized the results of the review.

Chart 1 - Identification (ID) and titles of Brazilian theses and dissertations on Audiovisual Educational Technologies for pregnant women.

ID	Title	Kind
E1	Validation of an educational video for the knowledge, attitude and practice of pregnant women in preparation for active childbirth	Thesis
E2	Animated infographic as a tool for empowering women in the labor and birth process	Thesis
E3	Paths to Normal Childbirth: construction of an Educational Technology for pregnant women	Dissertation
E4	Development and validation of educational technology for pregnant women about dental prenatal care	Dissertation
E5	When to go to the maternity ward? Educational technology for primiparous women about the signs of labor and obstetric risk.	Thesis
E6	Development of educational technology to prepare pregnant women and companions in the prevention of obstetric violence in public health units	Dissertation
E7	Construction and validation of the content of an audiovisual educational technology for pregnant women with hypertensive syndromes	Dissertation

Source: Survey results (2024).

CHARACTERIZATION OF THESES AND DISSERTATIONS ON EDUCATIONAL TECHNOLOGIES FOR PREGNANT WOMEN IN PRENATAL CARE

Regarding the main characteristics of the analyzed productions, of the seven selected studies, three (42.8%) identified themselves as theses and four (57.2%) as dissertations, and of these, two (28.6%) were from Professional Master's Degrees and two (28.6%) from Academic Master's Degrees. In total, the studies presented 32 (100%) descriptors. Among the most frequent descriptors cited in the studies, the term "educational technology" had the highest frequency (18.6% (n=06). The variations between "childbirth", "obstetric delivery", "normal delivery", "humanized delivery" and "beginning of labor" represented 15.6% (n=05) of the descriptors. The terms "obstetric nursing" and "prenatal care" accounted for 6.2% (n=02) each. The other terms that appear only once, such as "health education", "health promotion", "violence", "oral health", "gestational hypertension", "pregnancy complication", "high-risk pregnancy", "women's health", "empowerment", "social network", "educational film and video", "qualitative research", "sexual and reproductive rights", "pregnant woman" and "emotions" represented 46.8% (n=15) of the total terms. The analysis of the geographic distribution of the studies shows that almost half of the production on the theme is concentrated in the Northeast region, with 42.8% (n=3) of the total studies, followed by the North and Northwest, both with 14.3% (n=1) production in Pará and Manaus. The productions of the Southeast and South regions represent 14.3% (n=1) each. With regard to the area of knowledge according to the author's education, nursing had a predominance of 85.7% (n=6) and dentistry of 14.3% (n=1).

It is noteworthy that only two theses assumed a theoretical or methodological framework in their research, namely: Theoretical framework based on Foucault and Freire in the same thesis. The following thesis assumed the theoretical framework of the Complexity Paradigm and the methodological framework of the Grounded Theory. Regarding the year of publication and method of the studies, Table 1 is presented below.

Table 1 - Characterization of the year of publication and the method of Brazilian theses and dissertations on audiovisual Educational Technologies for pregnant women in prenatal care.

Year of Publication	N	%
2016	01	14,3
2019	01	14,3
2020	01	14,3
2022	02	28,6
2023	01	14,3
2024	01	14,3
Method		
Methodological	05	71,4
Quasi-experimental	01	14,3
Qualitative-descriptive	01	14,3

Source: Survey results (2024).

An important chronological distribution of research in the last five years and the predominance of methodological studies for the construction or validation of technologies are observed. Also, it can be identified that only two theses validated the educational technology with the target audience, one dissertation validated an educational video with expert judges and another dissertation validated the content of the educational technology also with judges. The other studies concluded the production stage of the material, without validation.

TYPE, PURPOSE AND CONTENT OF THE TECHNOLOGIES ANALYZED

Regarding the type of technology, most authors defined and/or worked with digital educational technologies, audiovisuals of the animated video type (E1, E3, E4, E5, E6, E7), one study developed an animated infographic. Among the studies, these addressed issues about health education and health promotion without significant theoretical deepening of the concepts. In addition, only two studies (E4 and E7) developed technologies with themes aimed at promoting the health of pregnant women with hypertensive syndromes and the benefits and importance of dental prenatal care, the others worked on preparation for childbirth, prevention of obstetric violence and the opportune moment to seek maternity care (E1, E2, E3, E5, E6). Discussions about the concept of educational technology (ET) proposed by Nietzsche were present in all studies. The concept of technologies defended by Merhy was also highlighted when directed to health education actions.

Regarding the elaboration of technologies, type and content, four studies consulted the target audience before the construction of the technology, through interviews (E1, E2, E3, E7). The studies (E4, E5, E6) defined content and type of technology, based on literature reviews.

According to the objectives and content of each technology developed, studies E1, E3 and E5 brought similar themes in their proposal. The E1 study aims to promote active childbirth. The script of the video was conceived from a previous study, with pregnant and puerperal women to show the entire process from the beginning of pregnancy, including conception, the three trimesters of pregnancy, preparation for childbirth, simulation of childbirth. E3 and E5 highlight the central theme involving respectively the search for information for empowerment and recovery of autonomy in choices for normal delivery, as well as the identification of signs of labor and obstetric risk, favoring decision-making related to the opportune moment to seek motherhood. At E3, the participants also participated in the choice of *the design*, color and *layout* of the technology.

The thesis (E2) sought to develop an animated infographic that presented the feelings of women about their births and the influence of society on the perception of these feelings, and based on individual interviews, the content of the infographic was obtained through content analysis.

In E4, for the construction of the animated video about dental prenatal care, its content was based on a literature review and the script portrays a pregnant woman with dental problems. Thus, the study aims that the knowledge acquired through technology can influence the change in behavior of pregnant women in order to encourage their adherence to dental prenatal care and also to healthier habits, with regard to oral health.

Studies E6 and E7 brought different but important aspects for maternal and neonatal health. The first, with content based on the integrative literature review, brings reflection for an autonomous, active and conscious performance of the woman and the companion during pregnancy, labor and delivery, sharing knowledge about the physiology of childbirth, good practices for safe obstetric care, the rights of women, companions and newborns, as well as informing about their rights and the characteristics and nuances of obstetric violence. The second study mentioned (E7) aimed at educating and promoting the health of pregnant women with hypertensive syndromes. In this case, the content emerged from semi-structured interviews with the target audience and literature reviews, elucidating situations of the daily life of pregnant women, as well as the guidelines for a healthy pregnancy in the face of gestational hypertension and its complications.

DISCUSSION

Research has demonstrated the importance of early capture and an adequate number of prenatal consultations in order to prevent avoidable deaths and improve labor and birth conditions. A retrospective study conducted with data from women who died, living in municipalities that are part of the coverage area of the Regional Health Department of Ribeirão Preto, found 36 maternal deaths, most of which occurred in women aged 20 to 29 years. The leading causes of death were hypertension, infection, and hemorrhage (Tintori *et al.*, 2022).

Early diagnosis and appropriate management of hypertensive conditions, such as preeclampsia and eclampsia, can reduce maternal mortality. The need for public health policies and strategies focused on education and improving access to prenatal care is also highlighted (Santos and Almeida-Santos, 2023). These complications can result in serious consequences for maternal and child health. Peraçoli *et al.* (2023) suggest that interventions to mitigate the severity of gestational hypertension include the incorporation of

about 140 minutes of physical activity per week and the use of specific medications, starting at an appropriate gestational age.

According to the results of this research, one of the studies aimed to educate and promote the health of pregnant women with hypertensive syndromes with the help of an ET. The content of the study was developed based on semi-structured interviews with the target audience and literature reviews, addressing the daily situations of pregnant women and providing guidance for a healthy pregnancy in the face of gestational hypertension and its complications (E7).

Also, in the face of the social and political transformations of pregnancy and childbirth care, humanized care has growing potential, with a view to respecting and valuing women's choices, their sociocultural origins, and their health demands (Benet *et al.*, 2018). It is understood that the care and guidance provided in prenatal care to prepare for childbirth, linked to an educational technology (ET), becomes more effective when compared to the care routinely used in isolation (E1).

For Nietzsche (2005), educational technology is a field that goes beyond the use of digital equipment and tools in the educational environment. For her, it involves the integration of methodologies, pedagogical strategies and technological resources in order to promote a more effective and meaningful learning environment. This statement is in line with the use of soft technologies in health care, which for Merhy (2002), the effectiveness of health care depends on an adequate combination between these different technologies, with a special focus on soft technologies, which are fundamental for humanization and quality of care.

In this sense, the conscious use of educational methods and strategies with an emancipatory/liberating character, in which the patient can be seen as a "conscious body", a subject who brings with him a history and his knowledge process, involves intercommunication and intersubjectivity in the construction of knowledge in health is extremely relevant for the construction of new ET (E3).

In the study by Borges *et al* (2020), a limiting factor highlighted on the use of ET is related to the insufficient use of effective educational tools that help in the process of community guidance by the professional, along with low professional adherence to develop educational and health promotion attitudes.

Because the understanding of health for pregnant women may differ from clinically established disease processes, the social determinants of health may influence health experiences and perceptions. For example, social and economic disadvantages, which may restrict opportunities for certain health practices, such as healthy eating and physical

activity (Palmer *et al.*, 2020).

To improve the effectiveness of health promotion initiatives in antenatal care, health professionals must also take into account the significance and priorities of health from the perspective of patients themselves. Research needs to investigate how women value and define their own health during pregnancy and qualitative studies can help close the gap between pregnant women and their health providers, promoting a mutual understanding of health (Epstein *et al.*, 2023).

Currently, studies on ET for pregnant women have been covering a variety of tools, such as mobile applications, educational videos, online programs, and other digital platforms. The literature review conducted by Brito *et al.* (2024) shows that these technologies help increase pregnant women's knowledge about topics related to pregnancy, childbirth, and postpartum care, in addition to reducing anxiety and stress.

In general, the population has been increasingly looking for quick information, with little reading and many visual resources, so the reproduction of short videos is on the rise on social networks at the moment. With simple language, visual resources prepared specifically for the topic to be discussed and the ease of its dissemination through social networks, it guarantees all women the possibility of accessing them and understanding the content (E2, E7).

Teixeira *et al.* (2023), for example, developed a project at the Jenny de Andrade Faria Institute, in Belo Horizonte-MG, with the objective of providing quality virtual information to pregnant women while waiting for prenatal care. The project transformed the time and space of the waiting room into an educational moment, addressing topics such as the rights of pregnant women, parturients and postpartum women, as well as doubts about breastfeeding. The videos, lasting between 5 and 10 minutes, presented information in an explicit and didactic way, facilitating the women's understanding. Technological products have become an essential part of care practice, and emerge as highly innovative playful tools, due to their versatility (Carvalho *et al.*, 2023).

The content built for an ET should address real situations and use explicit and accessible language to encourage people's participation in the educational process. In the meantime, it is understood that educational materials need to be carefully designed and validated before being made available to the target population. Validation confers greater credibility to ET and sustains nursing practices and research (Rosa *et al.*, 2019).

Therefore, nursing has been improving in terms of creating, validating, and evaluating products and processes based on the understanding of human praxis, with the objective of solving practical problems. This path highlights the interconnection between

theory and practice, as well as the interpretation and application of contemporary propositions that promote social transformation (Salbego *et al.*, 2023).

In view of this discussion, it should be noted that the present review demonstrated that only two theses concluded validation of the ET with the target audience. Such a process can be carried out through usability studies, which is a safe, dynamic, feasible and effective practice, allowing the evaluation of educational technologies to identify errors and improve both technology and content. This ensures greater interest and adherence to educational technology by the target audience (Soares *et al.*, 2023). Usability must consider the complexity of the interactions between the user, the context of use, and the functional characteristics of the technology, so that it is effective, easily accessible, secure, and capable of improving learning (Carvalho *et al.*, 2023).

Therefore, the limitation of this review is the number of studies found, which may have been caused by the use of a single national source of data. Another important factor is that the studies that evaluated ET with a target audience did not use a specific or validated instrument for this. In addition, it is suggested to expand the study with other studies not associated with theses and dissertations only.

FINAL CONSIDERATIONS

The present review study provided an overview of the production of knowledge in recent years related to theses and dissertations about audiovisual educational technologies for pregnant women. Most of the studies in this review deal with issues related to the parturitive context of women and families, with emerging themes such as obstetric violence and the right to positive experiences through humanized childbirth.

It is observed that there is still a gap in the evaluation of ET with a target audience in order to provide reliability and improve the use of the technology or product with specific audiences or from different contexts according to its proposition. Audiovisual resources have shown themselves to be attractive in modernity, due to their interactivity and easy handling. In this case, this review instigates the possibility of new research, aiming at the expansion of knowledge related to the production of technologies in various subjects that permeate women's health in the face of pregnancy, childbirth and postpartum.

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