

PODCAST AS A TOOL INFORMATIVE ABOUT THE GESTATIONAL PERIOD: A METHODOLOGICAL STUDY

PODCAST COMO HERRAMIENTA DE INFORMACIÓN SOBRE EL PERÍODO DE
EMBARAZO: UN ESTUDIO METODOLÓGICO

PODCAST COMO FERRAMENTA INFORMATIVA SOBRE O PERÍODO GESTACIONAL: UM
ESTUDO METODOLÓGICO

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Abstract

This article aims to develop and validate the content of a podcast on the physiological changes of pregnancy and the stages of embryonic and fetal human development. This is a methodological study. To that end, the following steps were taken: defining the set of objectives for the podcast; reviewing the scientific literature; planning and drafting the content of the podcast; reviewing the content of the podcast; validating the content of the podcast; and recording, editing and distributing the podcast. A total of eleven judges evaluated 39 items for objectivity, clarity and relevance. Only two items were not validated in the first evaluation and were submitted to a second evaluation with the recommended adjustments. After this second stage, all the items managed to achieve a CVI (Content Validity Index) of over 0.80. The podcast

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episodes are published and available online, ensuring reliable, quality information for pregnant women. It is therefore hoped that the podcast will contribute to improving health practices, care and guidance for users both in the local health network and at national level.

Keywords: Webcast; Women's Health; Embryonic and Fetal Development.

Resumen

Este artículo tiene como objetivo desarrollar y validar el contenido de un *podcast* sobre los cambios fisiológicos del embarazo y las fases del desarrollo embrionario y fetal humano. Este es un estudio metodológico. En este sentido, se llevó a cabo por etapas: definición del conjunto de objetivos del *podcast*; revisión de literatura científica; planificación y preparación del contenido del *podcast*; revisión del contenido del *podcast*; validación del contenido del *podcast*; y grabación, edición y distribución del *podcast*. Once jueces evaluaron 39 ítems en cuanto a objetividad, claridad y relevancia. Sólo dos ítems no fueron validados en la primera evaluación, siendo sometidos a una segunda evaluación con los ajustes recomendados. Luego de esta segunda etapa, todos los ítems lograron alcanzar un IVC (Índice de Validez de Contenido) superior a 0,80. Los episodios del *podcast* se publican y están disponibles en línea, lo que garantiza información confiable y de calidad para las mujeres embarazadas. Por lo tanto, se espera que el *podcast* contribuya a mejorar las prácticas de salud, la asistencia y orientación de los usuarios tanto en la red de salud local como a nivel nacional.

Palabras-clave: Webcast; Salud de la Mujer; Desarrollo Embrionario y Fetal.

Resumo

Este artigo visa desenvolver e validar o conteúdo de um *podcast* sobre as mudanças fisiológicas da gravidez e as fases do desenvolvimento humano embrionário e fetal. Trata-se de um estudo metodológico. Nesse sentido, foram percorridas as seguintes etapas: definição do conjunto de objetivos para o *podcast*; revisão da literatura científica; planejamento e elaboração do conteúdo do *podcast*; revisão do conteúdo do *podcast*; validação do conteúdo do *podcast*; e gravação, edição e distribuição do *podcast*. Onze juízes avaliaram 39 itens com relação à objetividade, à clareza e à relevância. Apenas dois itens não foram validados na primeira avaliação, sendo submetidos a uma segunda avaliação com os ajustes recomendados. Após essa segunda etapa, todos os itens conseguiram atingir um IVC (Índice de Validade de Conteúdo) superior a 0,80. Os episódios do *podcast* estão publicados e disponíveis no meio virtual, assegurando informações confiáveis e de qualidade para as gestantes. Portanto, espera-se que o *podcast* contribua para a melhoria das práticas, da assistência e da orientação em saúde de usuárias tanto da rede local de saúde quanto ao nível nacional.

Palavras-chave: Webcast; Saúde da mulher; Desenvolvimento Embrionário e Fetal.

Introduction

Pregnancy is a unique period with biological and psychological changes in a woman's life. It is a complex experience marked by fears, anxieties, insecurities, doubts, fantasies and curiosities, resulting from expectations about the transformations that are taking place during this phase (Brasil, 2000; Vasconcelos et al., 2020).

Therefore, creating spaces for health education about pregnancy in the health care of pregnant women is of the utmost importance. In these spaces, women can consolidate important information about pregnancy and other issues involving the health of the child, the woman and the family (Brasil, 2013).

Thus, prenatal care is the right time for health education with guidance on self-care prevention, proper care for the baby, clarification of doubts, interpersonal communication, promotion of autonomy and maternal empowerment (Quental et al., 2017). However, even when prenatal care is carried out properly, many women arrive at the end of their pregnancy feeling insecure and without the necessary knowledge about the changes resulting from pregnancy (Vasconcelos et al., 2020). This is due to the fact that information on prenatal care is provided in technical language and is not very didactic (Mcardle et al., 2015; Peat et al., 2012). In this way, pregnant women rely more on their own experience in subsequent pregnancies and on information from the internet, which is the main source of health information among pregnant women (Wilcox et al., 2015).

In the virtual environment, the Google search site is the most used by pregnant women because it is easy to access and has a didactic and culturally adapted language. The main doubts researched in this electronic medium are related to the development of the conceptus, maternal body changes and nutrition during the gestational period (Wilcox et al., 2015; Borges et al., 2021; Fernandes et al., 2013). In this sense, it is important that health workers try to get involved with virtual environments, through the process of producing content for these environments and indicating reliable sources for users (Mcardle et al., 2015; Wilcox et al., 2015).

Therefore, Information and Communication Technologies can work as tools to promote health education, which is one of the paths that the health service can take towards caring for women and pregnant women (Pio; Oliveira, 2014).

Thus, the use of podcasts, an audio file similar to a radio program made available on the web, is part of a broad context of the adoption of new Information and Communication Technologies supported by digital media and accessible mainly via the web, being an important tool for the development of health education (Muniz, 2017).

With this in mind, the aim of this paper was to develop and validate the content of a podcast on the stages of human embryonic development and the physiological changes of pregnancy.

Methodology

It is a methodological research, which promoted the investigation of methods of obtaining, organizing and analyzing data with the elaboration, validation and evaluation of research tools and methods, through steps implemented and debated at each completed stage (Polit; Beck, 2011). In this sense, this study consisted of the construction of an educational podcast on the phases of embryonic and fetal human development (block 1) and on the physiological changes of pregnancy (block 2), as well as the validation of the content of this product by specialists. To achieve this, the following steps were taken: defining the set of objectives for the podcast; reviewing the scientific literature; planning and drafting the content of the podcast; reviewing the content of the podcast; validating the content of the podcast; and recording, editing and distributing the podcast.

In terms of defining the set of objectives for the podcast, the aim was to design educational and informative podcasts for pregnant women about the stages of embryonic and fetal human development and the physiological and anatomical changes in the mother's body. The podcast is in audio format, lasting between five and ten minutes per episode and hosted on the Spotify platform.

In relation to the production of the content, a narrative review of the scientific literature was carried out by consulting books, articles and official documents on the aforementioned topics. A search was carried out in journals available online, with the aim of identifying publications on human embryonic and fetal development in the gestational trimesters, as well as physiological and anatomical changes in the maternal organism and on information and communication technologies, mentioning the use of podcasts as an educational tool in the production of knowledge.

The selected articles were located through an electronic search on the LILACS and SciELO websites, as well as the Nursing Database (BDENF), Ministry of Health Ordinances, Laws and Manuals and books. The keywords used were “women's health”, “prenatal care”, “podcast” and “information and communication technologies”. In this sense, there was no time cut-off or limitation of languages with free access to the full text and which addressed the descriptors above. As a subsequent step, each text was read in full, the information was hierarchized, showing the number of publications per database and, finally, grouped according to the content of the information presented.

Based on the narrative review of the scientific literature, the content of the podcast was developed, which was divided into two content blocks: block 1 covers the content of embryonic and fetal human development and is made up of 29 items that cover almost every week of the gestational period; block 2 corresponds to information related to the physiological changes of pregnancy and is made up of 10 items that cover, respectively: posture and ambulation; metabolism; blood system; cardiovascular system; urinary system; respiratory system; gastrointestinal system; endocrine system; skin and fangs; and physiological changes to the genitalia and breasts.

After this process, the contents were organized into logical sequences. It is worth noting that the authors also clarified the language in order to make the information clearer and more objective. Therefore, the instrument consisted of information in technical-scientific language and a second column, containing the same information, in colloquial and more accessible language. After this stage, the authors constructed an instrument called the “podcast validation instrument”.

The podcast validation tool had three stages, namely: stage 1, made up of questions related to the judges' sociodemographic profile - containing questions related to gender, age, education, qualifications and professional occupation; stage 2, made up of information items from block 1 of the content; and stage 3, made up of information items from block 2 of the podcast's content. It was then sent via e-mail to the judges for content evaluation.

Initially, the research team shortlisted 20 possible judges, based on the network of the researchers' research group. According to Pasquali (2010), between six and 20 judges are needed in technology validation studies. However, in order to take part in the validation process, it was necessary to achieve a minimum score of 6 points, according to the Fehring Validation model, namely: be a health professional (2 points); hold a PhD in the area of training (2 points); hold a Master's degree in the area of training (2 points); hold a specialist degree in at least one of the following areas of activity: maternal and child, technology in education, public health/collective health, health education and/or digital media (1 point); be a teacher in the health area (2 points); have publications within the maternal and child theme (1 point).

A total of 39 items were assessed. The judges had fifteen days to complete the survey. However, by the end of the initial period, only 11 judges had given feedback and made up the final sample. Therefore, meeting the requirements of the theoretical framework adopted in the research. After collection, the data was stored in an electronic spreadsheet and processed using simple descriptive statistics.

After returning the completed content validation instrument, the Content Validity Index (CVI) was calculated. This index measured the proportion or percentage of judges who agreed on certain aspects of the instrument and its items, by dividing the total number of items considered relevant by the total number of items. A minimum agreement rate of 0.80 was required for the item to pass (Alexandre; Coluci, 2011).

Thus, the CVI used a likert scale with a score of one to four. To assess the objectivity, clarity and relevance of the items in this study, the responses included: 1 = totally disagree, 2 = partially disagree, 3 = partially agree, 4 = totally agree. The index score was calculated by adding up the agreement of the items that were marked "3" or "4" by the experts. Therefore, the formula for evaluating each item individually was as follows: $CVI = \text{number of answers 3 or 4} / \text{total number of answers}$ (Alexandre; Coluci, 2011).

In relation to the stages of podcast development, Carvalho, Aguiar and Maciel (2009) propose the following structure: production, recording, editing, publication and distribution. For the production, recording and editing stages, the Anchor v.3.54.0

application was used, which is a free platform that offers tools to produce, record, edit and organize podcast episodes, enabling them to be distributed to various platforms (Achor, 2020). The first test episodes were recorded in August 2022. The remaining episodes were recorded in January 2023. The publishing and distribution stage was carried out using Spotify v 8.5.88.883, which is a platform that works seamlessly with the Anchor app and allows you to play various types of content, in addition to podcasts, such as music and video (Spotify, 2020).

The study took into account the guarantee of ethical and legal principles (BRASIL, 2012). It was submitted to the Research Ethics Committee of the Federal University of Rio Grande do Norte and approved under opinion no. 5.271.282, CAAE: 54018921.9.0000.5568.

Results

The sociodemographic profile of the eleven judges is described in detail in Table 1. The mean age was 36, with a minimum age of 26 and a maximum of 54. The mean length of professional experience was 8.6 years, with a minimum of three and a maximum of 20 years. The majority are female (81.8%), working in the fields of Nursing and Biological Sciences (27.3%). In relation to the highest degree, the majority have a doctorate (72.7%) and more than one professional occupation (63.6%).

Table 1 - Socio-demographic profile of the sample. Caicó, RN, Brazil, 2022. (n =11).

| Variables | f (%) |
|----------------------------------|-------|
| Age group | |
| 26 – 36 years old | 45.5 |
| 37 – 47 years old | 45.5 |
| >47 years old | 9.1 |
| Gender | |
| Female | 81.8 |
| Male | 12.2 |
| Professional training | |
| Biomedicine | 18.2 |
| Biological Sciences | 27.3 |
| Nursing | 27.3 |
| Medicine | 18.2 |
| Psychology | 9.1 |
| Maximum degree | |
| <i>Latu senso</i> specialization | - |
| Master's Degree | 27.3 |
| PhD | 72.7 |

| | |
|-------------------------------|------|
| Professional occupation | |
| Care | 18.2 |
| Teaching | 9.1 |
| Extension | - |
| Research | - |
| More than one occupation | 63.6 |
| Others | 9.1 |
| Length of professional career | |
| 3 – 9 years | 63.6 |
| 10 – 15 years | 27.3 |
| 16 – 20 years | 9.1 |

Source: from the research itself.

Each item was evaluated by the judges for objectivity, clarity and relevance. After this evaluation stage, the CVI was calculated. In block 1, of the 29 items evaluated, only item 1 - which referred to the first week of embryonic development - was not validated in the first round of evaluation - in other words, it did not reach a CVI >0.80. Thus, the adjustments recommended by the judges were made, resulting in the item achieving a CVI of 0.81 in the second evaluation. In relation to relevance, all the relevant items were validated in the first round of evaluation. Table 2 shows the results of the validation process for block 1.

Table 2 - Content Validity Index of embryonic human development, first and second evaluation rounds, in terms of objectivity, clarity and relevance - Caicó, RN, Brazil, 2022. (n =11).

| Item | First evaluation round | | Second evaluation round | |
|------|-------------------------------|-----------------|-------------------------------|-----------------|
| | CVI - Objectivity and clarity | CVI - Relevance | CVI - Objectivity and clarity | CVI - Relevance |
| 1 | 0.72 | 1.00 | 0.81 | 1.00 |
| 2 | 0.90 | 0.90 | 0.90 | 0.90 |
| 3 | 0.81 | 1.00 | 0.81 | 1.00 |
| 4 | 0.81 | 1.00 | 0.81 | 1.00 |
| 5 | 0.90 | 1.00 | 0.90 | 1.00 |
| 6 | 0.81 | 0.90 | 0.81 | 0.90 |
| 7 | 1.00 | 0.90 | 1.00 | 0.90 |
| 8 | 0.90 | 0.90 | 0.90 | 0.90 |
| 9 | 1.00 | 0.90 | 1.00 | 0.90 |
| 10 | 1.00 | 0.90 | 1.00 | 0.90 |
| 11 | 0.90 | 1.00 | 0.90 | 1.00 |
| 12 | 0.81 | 1.00 | 0.81 | 1.00 |
| 13 | 0.90 | 0.90 | 0.90 | 0.90 |
| 14 | 0.90 | 0.90 | 0.90 | 0.90 |
| 15 | 0.90 | 0.90 | 0.90 | 0.90 |
| 16 | 1.00 | 1.00 | 1.00 | 1.00 |
| 17 | 0.90 | 0.90 | 0.90 | 0.90 |
| 18 | 1.00 | 0.90 | 1.00 | 0.90 |

| | | | | |
|----|------|------|------|------|
| 19 | 1.00 | 0.90 | 1.00 | 0.90 |
| 20 | 1.00 | 0.90 | 1.00 | 0.90 |
| 21 | 0.90 | 0.90 | 0.90 | 0.90 |
| 22 | 0.90 | 0.90 | 0.90 | 0.90 |
| 23 | 0.90 | 0.90 | 0.90 | 0.90 |
| 24 | 0.81 | 0.90 | 0.81 | 0.90 |
| 25 | 0.90 | 0.90 | 0.90 | 0.90 |
| 26 | 1.00 | 0.81 | 1.00 | 0.81 |
| 27 | 0.90 | 0.90 | 0.90 | 0.90 |
| 28 | 0.90 | 0.90 | 0.90 | 0.90 |
| 29 | 0.81 | 0.90 | 0.81 | 0.90 |

Source: Originates from the survey itself.

In relation to block 2, only item 5 - which referred to changes in the urinary system - in terms of objectivity and clarity, was not validated in the first round of evaluation, as it had a CVI of 0.63. In this sense, the adjustments requested by the judges were made and the items were sent for a new evaluation. Item 5 was then validated with a CVI of 0.90, as shown in Table 3. In relation to relevance, all the items obtained CVI >0.80 in the first round of evaluation. Table 3 shows the results of the validation process for front 2.

Table 3 - Content Validity Index of physiological and anatomical changes in the maternal organism, first and second evaluation rounds, in terms of objectivity, clarity and relevance - Caicó, RN, Brazil, 2022. (n =11).

| Item | First evaluation round | | Second evaluation round | |
|------|-------------------------------|-----------------|-------------------------------|-----------------|
| | CVI - Objectivity and clarity | CVI - Relevance | CVI - Objectivity and clarity | CVI - Relevance |
| 1 | 0.90 | 0.90 | 0.90 | 0.90 |
| 2 | 0.90 | 0.90 | 0.90 | 0.90 |
| 3 | 0.81 | 0.90 | 0.81 | 0.81 |
| 4 | 0.90 | 0.90 | 0.90 | 0.90 |
| 5 | 0.63 | 0.81 | 0.90 | 0.90 |
| 6 | 0.90 | 0.90 | 0.90 | 0.90 |
| 7 | 0.90 | 0.90 | 0.90 | 0.90 |
| 8 | 0.81 | 0.90 | 0.81 | 0.81 |
| 9 | 0.90 | 0.90 | 0.90 | 0.90 |
| 10 | 0.90 | 0.90 | 0.90 | 0.90 |

Source: Originates from the survey itself.

After the content validation process, the research team proceeded to record the episodes. The podcast was titled as follows: “I'm Pregnant! What Will Happen To Me And My Baby?”. It has 39 episodes and is available for free on Spotify. The product can be accessed using the QR code below.

Figure 1 - Podcast QR code.



Source: Prepared by the authors.

Discussion

The physiological changes that occur during pregnancy, whether subtle or marked, are among the most significant that the human body can undergo (BRASIL, 2000). Therefore, the lack of information or inadequate information about childbirth, the fear of the unknown, as well as the care to be given to the newborn in the first few days are common stress factors for pregnant women, which negatively influence the whole process (Rios; Vieira, 2007).

Thus, with the advance of Information and Communication Technologies (ICTs), the internet has become the main vehicle for information about the gestational period. However, searching for information on the internet can be a problem, as some websites can provide discrepant information, which can have negative repercussions during pregnancy. For this reason, it is important for health professionals to be attentive to this type of research, not condemning it, but playing a guiding role in indicating safe, quality virtual content on aspects related to pregnancy. In addition, elucidating the degree of knowledge that pregnant women have about the development of the conceptus at different stages of pregnancy can help health teams to implement or strengthen health education programs (Fernandes et al., 2013). Therefore, new strategies should be devised to improve pregnant women's knowledge of aspects related to the gestational period, which can contribute to a healthier prenatal and perinatal period (Peat et al., 2012).

In this context, the practice of health education as a way of integrating care constitutes a space for reflection-action, based on technical-scientific and popular knowledge, culturally significant for democratic exercise, capable of provoking individual changes and readiness to act in the family and community, interfering in the control and implementation of public policies, contributing to social transformation (Castro et al., 2006). In this sense, the use of ICTs has increased in various sectors of the health service, mainly as tools to promote health education (Cherrez-Ojeda et al., 2020).

In this context, Health Information Technology (HIT) corresponds to the processing of both software and hardware information that deals with the storage, retrieval, sharing and use of health information, data and knowledge for communication and decision-making (Longaray; Castelli, 2020).

From this perspective, in 2010, the World Health Organization (WHO) incorporated e-health as a concept that encompasses the safe and cost-effective use of ICTs in support of health and health-related areas, including health services, health surveillance, health literature, health education, knowledge and research (Cherrez-Ojeda et al., 2020).

Therefore, health activities cannot be limited to the physical spaces of the services, and professionals should indicate reliable information resources that can be consulted outside the health service environment. In this sense, it is essential for health workers to know the main doubts that pregnant women have about the gestational period, as well as the educational tools on these subjects that can be used outside the health service environment by these users.

Hence, strengthening health education through ICTs, such as podcasts, is necessary, since this type of education is important for preventing diseases and promoting the autonomy of the subjects involved, making them active subjects and transformers of their own lives or even of their society (Luiza et al., 2011). Thus, it can be said that health education is an educational process of building health knowledge aimed at the thematic appropriation by the population and not at professionalization or a career in health (Brasil, 2012).

As a result, podcasts are a technology that has been gaining prominence in recent decades, as it has particular characteristics, such as flexibility in its production and distribution aspects, thus adding pedagogical possibilities (Tiago et al., 2018). In this sense, the podcast consists of a medium for transmitting information through a personalized radio program that can be recorded in various audio formats and stored on a computer or made available on the Internet, covering a multitude of topics and can be accessed by various people in various locations (Barros; Menta, 2007).

Due to their low cost, ease of production, handling and dissemination, podcasts have been used in various ways in the teaching-learning process, reaching different levels of education and areas of knowledge (Aguiar; Carvalho; Carvaho, 2014). In addition, some recent research has suggested that this tool facilitates the process of health education, as it can be reproduced on computers, tablets or cell phones and anywhere: at home, on the way to school or on public transport (Barros; Menta, 2007).

Understanding, therefore, that the expansion of information technology in the coming decades is likely to be exponential and that new technologies will offer ample opportunities for those who are able to overcome the initial barriers of competence and familiarity with the powerful tools of information and communication technology (Cruz et al., 2011).

In the study, a total of 11 judges were selected to evaluate 39 items on embryonic and fetal human development and maternal physiological changes. The items were analyzed for objectivity, clarity and relevance. After adjusting the judges' suggestions, the content was validated.

The podcast episodes are published and available online, ensuring reliable, quality information for pregnant women. Thus, it is hoped to improve the experience of women and their families during the gestational phase, resolving the main doubts that arise during this period. Initially, the project was intended to be distributed locally, to health units in the municipality of Caicó, Rio Grande do Norte, Brazil. However, given its reach on the platform provided, it is hoped that the product can reach different regions of the country.

A limitation of the podcast is that it does not yet have a space for direct questions, i.e. open communication with pregnant women. However, it is recommended that pregnant women can discuss and answer questions with the health professionals who will be accompanying them during the gestational period.

Conclusion

The content of an educational-informative podcast on the stages of embryonic and fetal human development and the physiological changes of pregnancy was developed and validated. After two rounds of evaluation, all items were validated with a CIV > 0.80. In other words, the items were judged to be clear, objective and scientifically relevant.

The podcast is available free of charge in audio format, lasting between five and ten minutes per episode, and hosted on the Spotify platform. The podcast is expected to: “I’m pregnant, what will happen to me and my baby?” contributes to the most important role of science in developing countries: improving health practices, care and, in this specific context, health guidance for pregnant listeners.

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