

Pregnant women's contribution in the construction and evaluation of an educational technology: the "Comics for Pregnant Women"

Contribuição de gestantes na construção e avaliação de uma tecnologia educacional: o "Almanaque da Gestante"
Contribución de embarazadas en la construcción y evaluación de una tecnología educacional: el "Almanaque de la Embarazada"

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ABSTRACT

Objectives: to describe the contribution of pregnant women to the construction and evaluation of educational technology. **Methods:** a participatory study developed in three stages, which occurred between March 2018 and June 2019 for identifying the content, construction, and evaluation of the comic. Non-directive interviews were conducted in educational groups with 34 pregnant women. After the comic was built by a team, including a designer, an instrument was applied to 41 pregnant women to evaluate the items Objectives, Organization, Writing style, Appearance, and Motivation. **Results:** the comic contains 40 pages of contents, illustrations, and quizzes (word search, cross-puzzle, seven mistakes, etc). The pregnant women evaluated it as easy to understand, self-explanatory, aesthetically attractive, and capable of motivating good care practices during pregnancy, obtaining a minimum agreement of 92.1%. **Final Considerations:** the innovation of the educational technology consisted of incorporating the voices of pregnant women in prenatal care, with the potential to stimulate reflections and the learning process of this target audience. **Descriptors:** Pregnant Women; Educational Technology; Prenatal Care; Primary Health Care; Maternal-Child Nursing.

RESUMO

Objetivos: descrever a contribuição de gestantes na construção e avaliação de uma tecnologia educativa. **Métodos:** estudo participativo desenvolvido em três etapas, ocorridas entre março de 2018 e junho de 2019: identificação do conteúdo, construção e avaliação do almanaque. Realizaram-se entrevistas não diretas em grupos educativos com 34 gestantes. Após construção do almanaque por uma equipe contando com designer, aplicou-se um formulário a 41 gestantes para avaliação dos quesitos Objetivos, Organização, Estilo da escrita, Aparência e Motivação. **Resultados:** o almanaque contém 40 páginas de histórias em quadrinhos e jogos do tipo caçapalavras, labirinto, sete erros etc. As gestantes o avaliaram como de fácil entendimento, autoexplicativo, esteticamente atrativo e capaz de motivar boas práticas de cuidados na gestação, obtendo-se concordância mínima de 92,1%. **Considerações Finais:** a inovação da tecnologia educacional consistiu na incorporação das vozes das gestantes em cuidados pré-natais, com potencial para estimular reflexões e o processo de aprendizagem desse público-alvo. **Descritores:** Gestantes; Tecnologia Educacional; Cuidado Pré-Natal; Atenção Primária à Saúde; Enfermagem Materno-Infantil.

RESUMEN

Objetivos: describir contribución de embarazadas en la construcción y evaluación de tecnología educativa. **Métodos:** estudio participativo desarrollado en tres etapas, entre marzo de 2018 y junio de 2019: identificación del contenido, construcción y evaluación del almanaque. Realizaron entrevistas no directivas en equipos educativos con 34 embarazadas. Tras construcción del almanaque por un equipo contando con diseñador, aplicó un formulario a las 41 embarazadas para evaluación de quesitos Objetivos, Organización, Estilo de escrita, Apariencia y Motivación. **Resultados:** almanaque contiene 40 páginas de historias en cuadros y juegos del tipo caza palabras, laberinto, siete errores, etc. Embarazadas lo evaluaron como de fácil entendimiento, autoexplicativo, estéticamente atractivo y capaz de motivar buenas prácticas de cuidados en la gestación, obtuvo concordancia mínima de 92,1%. **Consideraciones Finales:** innovación de tecnología educacional consistió en la incorporación de voces de embarazadas en cuidados prenatales, con potencial para estimular reflexiones y proceso de aprendizaje de ese público objeto. **Descriptoros:** Embarazadas; Tecnología Educacional; Cuidado Prenatal; Atención Primaria de Salud; Enfermería Materno-Infantil.

INTRODUCTION

During pregnancy, a woman experiences a unique event, for it is a time marked by psychological, hormonal, and physical changes that prepare the mother's organism for the development of a new being⁽¹⁾. As a physiological phenomenon, pregnancy should be seen as part of a healthy life experience. Thus, comprehensive prenatal care must be organized to meet pregnant women's real needs by strengthening the health systems⁽¹⁻³⁾.

The goal of prenatal care is, by monitoring pregnancy, to ensure the birth of a healthy newborn with no impact on maternal health. Quality prenatal care is capable of reducing maternal and child morbidity and mortality. Thus, it is essential to ensure minimum resources, such as adherence to the recommended number of consultations, early recruitment of pregnant women, psychosocial approach, educational and preventive activities, and adequate technical and scientific knowledge⁽²⁻³⁾.

Health education actions are the differential for pregnant women's health; however, the lack of guidance during consultations, coupled with poor management of essential care, contributes negatively to the quality of prenatal care. Therefore, professionals must always be attentive and sensitive to the pregnant women's questions since the guidance becomes more effective when it occurs by exchanging experiences between professionals and pregnant women, which can be promoted individually or through educational groups⁽³⁻⁴⁾.

To facilitate the understanding of pregnant women and make the nurse's role as a mediator of educational activities more dynamic and interactive, the creation of educational technologies has been widely explored in nursing publications. Some examples are booklets, serialized albums, cartoon scripts, almanacs, comics, and booklets, among others⁽⁵⁻⁸⁾.

It is known that technology contributes to intensify the individual's abilities by offering new information. Through it, he/she acquires knowledge and can transform him/herself⁽⁴⁾.

Thus, the crossing of the themes "prenatal care of pregnant women" and "educational technology" aroused the interest in developing a creative technology, able to bring information in a colloquial language, and, at the same time, promote playfulness. The technology in the form of an comics was chosen because it represents a popular knowledge transmission genre through narrative dialog, which aims at an informal conversation, mixing variations of knowledge and discourse to bring scientific knowledge and popular knowledge closer together⁽⁹⁾.

The study is justified by the importance of educational activities in pregnant women's care and the lack of support material for use by nursing professionals. The participation of pregnant women in this construction is relevant to meet their real needs. Furthermore, the description of the comics' development and evaluation may stimulate other professionals in the area to bet on creativity and seek partnerships to create educational materials aimed at health promotion in related areas.

OBJECTIVES

To describe the contribution of pregnant women to the construction and evaluation of educational technology.

METHODS

Ethical aspects

The project was approved by the Research Ethics Committee of the Center of Health Sciences at the Federal University of Espirito Santo, with the Certificate of Presentation for Ethical Appreciation (CAAE). The participants were informed about the study personally and oriented about the study objectives, risks, benefits, and guaranteed anonymity. After reading, they signed the Free and Informed Consent Term before the interview. Besides, they were informed of their freedom to refuse to continue participating in the study, interrupting the interview, or withdraw any time without jeopardizing their future care.

Theoretical and methodological framework

The methodological approach of participatory research was applied, whose assumptions refer to the participant's involvement in everyday life processes and context. In the encounter of ontologies, there is a transfer of power and control from the researcher to the participant. The socially constructed perceptions and knowledge constitute the alterity of the participants and are collected in the research through attentive, sensitive, and respectful listening by the researcher⁽¹⁰⁾.

Type of study

A participatory qualitative approach followed the guideline of Consolidated Criteria for Reporting Qualitative Research (COREQ).

Methodological procedures

The research was developed in three stages, between March 2018 and June 2019, such as content identification, comics elaboration, and evaluation.

Study setting and participants

The research was conducted in a Primary Health Care unit. The participants were pregnant women in prenatal care, chosen according to attendance to consultation or participation in this unit's educational activities. Underage pregnant women and those without physical and cognitive conditions to communicate were excluded. The invitation to potential research volunteers occurred during the first prenatal consultation with the nurse in Primary Care.

Data collection, organization and analysis

The identification of the comic content was made through a non-directive interview in health education groups. An institutional health education group of pregnant women has already been taking place in the health service once a week and conducted by the family nurse. The collected data were systematized and reworked, following the proposed method. The choice of a participatory approach with active and collective listening to the pregnant women was fundamental in preparing the comics.

For attending the study's objective, three themes were exposed and discussed in the groups: pregnancy, prenatal care, and childbirth. These were fixed on a board, one after the other, until the discussions were exhausted. The pregnant women organized themselves in a semicircle, facing the board, and were encouraged to talk freely about them. The educational groups, totaling five, occurred in weekly meetings between March and May 2018, with an average duration of 90 minutes. The average number of participants per group was eight pregnant women, who differed at each meeting. The groups followed the unit's routine, and the meetings were held every Tuesday, in the afternoon period, by the nurse. The dialogues were recorded on MP3 players, and the content was transcribed in full and read thoroughly.

The data were treated using the content analysis technique according to Bardin⁽¹¹⁾.

The fieldwork was closed when the theoretical saturation of the data occurred. The coding of the registration units was carried out to identify the thematic categories grouped into the three themes of the non-directive interview. A table was drawn up describing the pregnant women's speeches, feelings, perceptions, and knowledge. Based on the transcriptions, the information was categorized into sub-themes and related to the prenatal theme's main issues. According to the meaning units, the most relevant themes were extracted to build the comics' content.

The pregnant women's unified speeches were counted according to the frequency of unit of a register, the number of times the theme was mentioned, being shown in the text in cardinal numbers, in parentheses.

The contents were sought in the Ministry of Health's manuals, articles, and books on obstetric nursing for the scientific basis. The selection of educational games occurred through research of existing hobby magazines, primers, and almanacs. The comics prototype was built based on images acquired from an open internet bank that represented the initial idea of what was being proposed. The prototype's content was revised and adapted for popular language, illustrated, and layout. Also, we can count on the collaborative interdisciplinary team formed by a designer, Portuguese proofreader, and health professionals from the Federal University of Espírito Santo.

For the evaluation stage, the second group of pregnant women was formed in the same health unit whose participants were randomly chosen. Pregnant women who could not read were excluded from this stage. The six meetings held between May and June 2019 lasted an average of 90 minutes. In each meeting, the pregnant women were welcomed and invited to read the comics to evaluate the pictures, characters, stories, texts and answer the quiz. At the end of the encounter, they were invited to return for another reading and evaluation session. We agreed that the next meeting should schedule according to their availability. New pregnant women were inserted as they attended the meetings since the comics can be read in several stages. The average number of participants per group was seven pregnant women. The participants received the orientation that, during the evaluation, they could ask for clarifications from the researcher.

At the end of each meeting, the pregnant women reported their experience using the comics and answered a form with the items: Objectives, Organization, Style of writing, Appearance, and Motivation. They marked with an "X" one of the options, containing

the dichotomous variables: 1 - I agree; 2 - I do not agree. Items that reached a minimum of 80% agreement were considered adequate, as recommended by other methodological studies⁽¹²⁻¹⁴⁾.

In the stages of the content elaboration and evaluation, for preserving the participants' anonymity, each speech, names of who participated were replaced by G and A's letters, respectively, followed by a cardinal number.

RESULTS

In the identification stage of the comics' content, 34 pregnant women between 18 and 44 years of age participated. The majority (19) declared themselves as brown and the minority (7) as black. Among them, 18 were married, ten lived in a stable union, and six were single. As for education, 16 had completed high school, seven had not, another seven had completed elementary school, and only four pregnant women were in higher education. Regarding pregnancy experience, related to the number of times they had been under prenatal care, 18 were in their second pregnancy, 10 were primigravida, four were in their third, and one was in her fifth.

The information extracted from the pregnant women's speeches was grouped by themes (Discovery of pregnancy, Prenatal care, and signs of labor) and conveyed in eight comic strips. The titles of these stories were: Discovering Pregnancy; Learning with the group of pregnant women; Peel more and unpack less; The revelation; Mosquito Shoo; What is syphilis?; The big day; and The arrival of the baby.

The "Pregnant Woman's Comics" comprises a cover/back cover and 38 color pages, printed on off-set paper, 21 cm high and 15 cm wide. The cover is 120 g thick, and the inside is 90 g.

The characters are the pregnant woman Ana, her husband Zeca, her son Rafa, the expected baby Nina, grandma Lena, aunt Tetê, and nurse Flora. A brief description of Ana's family was produced in the comics' first pages (Figure 1).



Figure 1 - Comics' cover and the characters' presentation, Vitória, Espírito Santo, Brazil

The comics' cover images were intended to be inviting and attractive, arousing the reader about the importance of family support during pregnancy, bringing this audience closer to the characters, and creating a cultural identification with them.

Family participation in the lives of pregnant women is essential to attenuate the uncertainties and expectations when

facing something not always planned, as evidenced in the following statements:

When I found out [...] actually, I wanted to be a mother, but I was afraid at the same time. [...] I enjoyed my marriage a lot. I saw that a baby was missing for my husband and me, so [...]. At the first moment that I found out I was pregnant, I was desperate because he was unemployed. Still, after, my mother talked to me a lot, and now it's okay. (G14)

I did the pharmacy test, and it was positive. At the time, I was a little desperate [...], but then it was calmer because my mother said, 'I always wanted to be a grandmother.' And now my sister is going to have a baby. I think I was calmer because the whole family supported me. (G16)

The pauses with quizzes were made between the stories, including 13 pastimes such as word searches, memory games, seven mistakes, and mazes to stimulate the reader's continuation of immersing in the comics. The comics also include the vaccination calendar for pregnant women, recipes for cakes, and layered tips to be taken to the maternity hospital.

In content elaboration, the theme "Discovery of pregnancy" was addressed in the story "Discovering pregnancy". The pregnant women's reports on the presence of discomfort included nausea (62 reports), breast pain (33), and suprapubic pain (12).

I am sick, I force it, but the food doesn't stay. The only thing I can eat is green guava with salt. (G7)

I have many breasts and always have to wear a bra because otherwise, it weighs, it hurts. (G8)

I feel a pain like this in my stomach [suprapubic pain]; I did not feel it from the others. (G15)

Other discomforts were also included, such as heartburn (nine), headache (six), and lower back pain (five). In order to inform pregnant women about the care that relieves symptoms like these, the game "word search," the game "you need to know," and the game "bonding" was elaborated (Figure 2).

The feelings aroused by the discovery of pregnancy that stood out the most in the reports were fear (5), desired pregnancy (10), and unwanted pregnancy (11). All of them are experienced in a fictional way by Ana when she receives support from all her family and Nurse Flora.

In the story "Learning with the group of pregnant women," Nurse Flora addresses the importance of family participation during Ana's pregnancy (the character who is pregnant). She also values group activities as a strategy to reduce insecurities and facilitate learning among pregnant women.

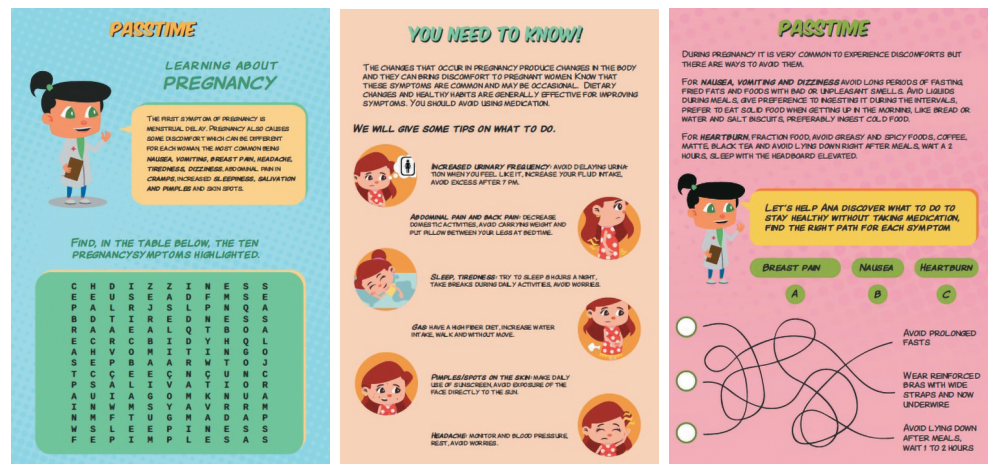


Figure 2 – Pages of the comics with information and quizzes about the complaints of pregnant women, Vitória, Espírito Santo, Brazil

According to the frequency of reports, the theme "Prenatal" was included in the almanac in the various stories and games. They are food (44), food hygiene (28), toxoplasmosis (28), use of vitamins (ferrous sulfate and folic acid) (19), Dengue/Zika/Chikungunya (17), use of drugs, alcohol, and cigarettes (15), hydration and urinary infection (13), hypertension and gestational diabetes (10), vaccination (8), and exercise practice (2). These issues were broken down into care for a healthy pregnancy, possible complications in pregnancy, and ways to prevent them.

For pregnant women, a healthy diet is one rich in vegetables and legumes.

I am taking the soda out because it gives me heartburn. I took [the soda] in the other daughter's pregnancy, and she didn't have colic. They [the professionals] say that [soda] gives you colic. I love pork [...] in my first pregnancy, I didn't eat it. When the cesarean was over, it was the first thing I ate. (G10)

You have to eat more vegetables. I love to drink beer. I love to drink, but now I will stop. (G13)

Eat every three hours. (G12)

I cut out fried food, soda, beer. (G17)

I like salad a lot. I put lemon, onion, cilantro with the vegetables. I eat everything, and I don't get fat; I don't eat anything fattening. (G13)

The importance of healthy eating in pregnancy was included in the story "Peel more and unpack less." In it, food hygiene, the game of choosing between healthy and unhealthy foods, alcohol, and other drug consumption during pregnancy were addressed.

Other issues related to prenatal care - involving toxoplasmosis, Dengue/Zika/Chikungunya; hydration; and prevention of urinary infection - have been addressed in the almanac in the formats "comics" and or "games" (pastime). Before each pastime, there is an informative text narrated by nurse Flora, directed to pregnant women, about what care can be beneficial during pregnancy.

In the story "The Revelation," the characters Ana and Zeca arrive at Aunt Tetê's house to announce a baby girl (Nina), the family's newest member.

The third theme, labor, originated from the reports about signs of labor: pain/contraction (20), the rupture of bag water (17), and the loss of the mucous plug (12). Among these, the reports of pain stand out.

[...] *I felt a lot of pain. I was at home with my mother at the time.* (G13)

[...] *I was leaving work, and then I started to feel pain, then they wanted to take me, and I said: "No, he won't be born now. Then, the next day, the pain continued, so I went [...]."* (G17)

In the story strip "The big day," the character Ana talks to Zeca about the symptoms that indicate the beginning of labor and warns about the importance of calculating the time of arrival at the closest maternity hospital and checking the items that are essentials to pack for woman and baby. Pastimes were prepared, a word search and a maze, with tips from nurse Flora on the signs of labor, maternity hospital choice, and a chart with suggestions on what should be in the baby's and pregnant woman's bag pack.

The comics ended with the story "The baby's arrival," in which Ana and Zeca take Nina home and are welcomed by their family. The comics' content used short texts, as close as possible to the language of the public that attended the groups. We chose a dialogic language, exploring the active voice, having nurse Flora as the educational information protagonist to bring the health professional closer to the public, promote bonding, and simplify informal learning. The information followed a chronological order according to the changes and needs of each trimester of pregnancy. The quiz' answers can be found on the last page of the "Comics for Pregnant Women."

Evaluation of the Comics by the target audience

The 41 pregnant women who participated in the comics evaluation stage were between 18 and 42 years old. Most of them (35)

were in their first trimester of pregnancy. Their education level was variable since 20 had completed high school, eight did not finish it, 8 had a college degree, and six had an only elementary school. As for marital status, 24 were married, nine were single, seven were in a stable union, and two were divorced. Regarding the previous experience with pregnancy and prenatal care, 23 were in their second pregnancy, 12 were primigravida, and the other seven had between three and four children.

Once the production was finished, the comics educational material was read and evaluated by the pregnant women in the items Objectives, Organization, Writing style, Appearance, and Motivation. All items reached agreement above 80%, with a minimum percentage of 92.1%; therefore, the material was considered adequate (Table 1).

Some women had difficulty playing the quiz about sexually transmitted infections (STIs), but others reported that it was interesting because it facilitates their understanding of each disease's signs and symptoms since they could consult the template.

I found this quiz here difficult, the diseases. (A41)

It is fascinating; I found the part about the diseases, how to detect and how to treat them. It was very valid. (A26)

As for the writing style, two pregnant women did not know the terms "edema," "pruritus," and "constipation." Another term with the same meaning but more familiar was chosen together with them to facilitate understanding. Two terms were kept, and the other in parentheses to provide an expansion of vocabulary.

Regarding the illustrations, in the quiz named "spot the difference," the orange illustration was considered a mistake. Thus, the image was reformulated after suggestions. Moreover, the pregnant women's adjustments regarding the content of STIs and the unknown terms were accepted.

Table 1 – Evaluation of the comics concerning Objectives, Organization, Writing style, Appearance, and Motivation, Serra, Espírito Santo, Brazil, 2020

Evaluation items	Agree		Don't agree	
	n	%	n	%
1. Objectives				
1.1 Does the comics contain the necessary care during the prenatal period?	41	100	0	0
1.2 Does the comics clear up your doubts about prenatal care?	39	95.1	2	4.9
1.3 Does the comics encourage you to learn about prenatal care?	41	100	0	0
2. Organization				
2.1 Does the cover show the subject of the a comics?	41	100	0	0
2.2 Does the content of the comics have a sequence?	41	100	0	0
2.3 Is the material (paper/print) appropriate?	41	100	0	0
2.4 Is the size of the title and content in the story adequate?	40	97.3	1	2.7
2.5 Is the size of the quiz adequate?	40	97.3	1	2.7
2.6 Were you able to perform the activities proposed by the games?	38	92.1	3	7.9
3. Writing style				
3.1 Was the information written in clear language?	39	95.1	2	4.9
3.2 Is the text interesting?	41	100	0	0
3.3 Is the characters' speech enlightening?	41	100	0	0
4. Appearance				
4.1 Is the cover of the almanac attractive and did it catch your attention?	41	100	0	0
4.2 Do the pictures/illustrations help you understand what is written?	41	100	0	0
5. Motivation				
5.1 Did you feel like reading the material all the way through?	41	100	0	0
5.2 Is the comics fun?	40	97.3	1	2.7
5.3 Did the comics allow you to acquire new knowledge?	41	100	0	0
5.4 Did the almanac stimulate you to change behaviors and attitudes?	41	100	0	0

In general, the pregnant women found the material easy to understand and explanatory, highlighted relevant parts, and suggested that it be disseminated to other pregnant women.

I found it very interesting, it is well explained. There are things that you are saying here that I didn't do; I'm going to start doing. I used to eat a lot of junk food. (A18)

Very valid, because we all have had children, we have been through everything. Still, some people don't have this knowledge, so if this is created and expanded to other places, it will help these people. I thought it was great! I feel like taking it home. The recipes, I feel like making some, look delicious. (A33)

The way it is in comics, it is not that tiring thing. [...] you interact and end up learning better. (A10)

I liked it very much! The almanac is very enlightening, well understood, no need for change. (A40)

I liked it very much! It is easy to understand, suitable to pass because the quiz ends up keeping our attention. (A41)

DISCUSSION

The issues most often mentioned by pregnant women were STIs and nutrition care. When dealing with infections during pregnancy, these can affect women's reproductive health and influence the child's development. In Brazil, the incidence rate of congenital syphilis and syphilis in pregnant women is estimated to increase about threefold over six years. Congenital syphilis can cause devastating health complications, which includes: fetus and neonatal death, preterm childbirth, seizures, intrauterine growth retardation, blindness, and deafness⁽¹⁵⁻¹⁷⁾. These epidemiological data justify the need to address syphilis among STIs in a comic book of the "Pregnant Woman's Comics," including the partner approach, which has been little present in the educational activities developed in the health unit^(2,16-19).

For effective prevention of infectious diseases and healthy and responsible sexual behavior, information, education, and individualized counseling should be integral elements of primary health care. Thus, risk assessment, screening, and treatment of specific infections should be part of preconception and prenatal care, as there is evidence that treatment effectively prevents neonatal infections^(17,19).

As for food guidance, pregnant women highlighted questions about healthy eating, food hygiene, foods to reduce discomforts such as nausea and heartburn. It also included some myths and issues such as alcohol consumption during pregnancy and postpartum. The Ministry of Health and the World Health Organization points out that prenatal care should develop educational strategies and offer healthy and adequate nutritional guidance to pregnant women. For doing so, it should consider that inadequate nutrition during pregnancy increases the risk of low birth weight, restricted fetal growth, neural tube defects, maternal obesity, pre-eclampsia, gestational diabetes, and premature birth.

In the first trimester, due to hormonal changes, the most prevalent symptoms are nausea, vomiting, drowsiness, breast tenderness, and dizziness. It is essential to explain that these are common symptoms in pregnancy. Furthermore, some guidelines can help get relief in case of nausea and heartburn, such as: maintain a fractionated

diet; avoid liquids during meals, fried foods and foods with strong smells; eat solid foods early in the morning; consume cold foods^(3,5).

Through a playful and interactive approach, familiar and straightforward words make the "Comics for Pregnant Women" different from other available materials. In this sense, the textual preparation must be adequate to the educational and cultural level of the target audience; and the participation of their representatives through educational groups contributes to the credibility and acceptance of the educational technology^(9,13-14,20-21).

It is relevant to consider the evaluation of the intended audience, and the reception of these materials is important for professionals interested in using reliable and adequate instruments for the population^(5-6,12,14). Educational technologies need to stimulate self-care and encourage changes in habits and can help both nurses and other health professionals who work with the theme through the standardization of information, avoiding professional differences and insecurity to pregnant women. Health education is strategic for improving health literacy, the quality of prenatal care, and the effectiveness in the healthy development of the pregnant woman and the baby^(3-5,8,13,20).

Study limitations

One limitation of the study refers to the evaluation of the material by a limited number of pregnant women belonging to the same geographic region, which restricts the findings' generalization. Another concerns the comics reception and applicability in all trimesters of pregnancy since the most significant number of pregnant women who participated in the research experienced the first trimester of pregnancy.

Contributions to the area

The Comics as an educational technology can stimulate self-care and encourage changes in habits, helping nurses and other health professionals who work with the theme, through playful material and with information based on scientific evidence and official documents.

It also contributed by presenting a reproducibility strategy for building educational materials in similar practice settings.

FINAL CONSIDERATIONS

The technology "Pregnant Woman's Comics" is intended for all women during pregnancy and their families as a self-explanatory tool for learning about care. It is also aimed at health institutions and professionals as a support material in health education strategies of women's health promotion. The comics educational material was built based on the needs of pregnant women and the recommendations of the Ministry of Health manuals and clinical guidelines for obstetric nursing. More than 80% agreement was obtained in all evaluation items, with minor adjustments suggested by the pregnant women. The public showed contentment, describing the technology as attractive and comprehensive, motivating care in pregnancy.

The innovation of this educational technology consisted of incorporating the voices of pregnant women in prenatal care to stimulate reflections and the learning process of this target audience. Besides, the use of games that make learning more dynamic,

the presence of characters representing the Brazilian family, and the popular language used in the comics bring the audience closer to the technology's content, which can be considered an innovation compared to other educational materials. It is hoped that the comics can stimulate new educational technologies using to promote playfulness and facilitate learning about the various themes involving the pregnancy-puerperal cycle.

It is necessary to make the "Comics for Pregnant Women" available to pregnant women assisted in the Unified Health System's health services. It is intended to develop other studies to evaluate the technology's effectiveness as a resource of information in prenatal care, complementary and available to pregnant women and their families. Its content can help in decision-making about care during the prenatal period.

The possibility of other editions of the almanac with new themes covering the puerperal period, breastfeeding, and care of the newborn is considered.

The printed version of the material was considered accessible and preferred by the target audience involved in the research; however, judging by current changes and the possibility of expanding the material's availability to a diverse audience, the electronic version of the comics was not discarded.

The importance of interdisciplinary production with a team of graphic designers and lettering professionals to translate and materialize pregnant women's ideas is emphasized. It is considered that the article can stimulate nursing and health professionals to invest in creativity as a tool for the production of care.

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