

# Educational technology to promote father involvement in childbirth and birth

*Tecnologia educacional para promoção do envolvimento de pais no parto e nascimento*  
*Tecnología educacional para promoción del involucramiento de padres en el parto y nacimiento*

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## ABSTRACT

**Objectives:** to build and validate an educational booklet to promote the involvement of parents in labor and birth. **Methods:** methodological study developed in five stages: situational diagnosis; bibliographic survey; construction of illustrations, layout, design and texts; content and appearance validation by judges (25 experts) and calculation of the Flesch Readability Index; and validation with the target audience (12 parents). A minimum Content Validity Index of 0.80 was considered. **Results:** the booklet was entitled "Father Presence" and was developed in 11 topics. In Content and Appearance Validation, the Validity Index obtained an overall score of 0.97. Cronbach's alpha was 0.92, indicating excellent reliability of its content. A global score of 74% for readability was obtained, considered easy to understand. **Conclusions:** the material was successful in the validation process, and it can be recommended for parents to use it during the prenatal period, promoting the inclusion of the partner and preparing them for labor and birth.

**Descriptors:** Fathers; Parturition; Humanizing Delivery; Educational Technology; Validation Study.

## RESUMO

**Objetivos:** construir e validar uma cartilha educativa para promoção do envolvimento de pais no parto e nascimento. **Métodos:** estudo metodológico desenvolvido em cinco etapas: diagnóstico situacional; levantamento bibliográfico; construção das ilustrações, layout, design e textos; validação de conteúdo e aparência por juízes (25 especialistas) e cálculo do índice de Legibilidade de Flesch; e validação com o público-alvo (12 pais). Considerou-se Índice de Validade de Conteúdo mínimo de 0,80. **Resultados:** a cartilha intitulou-se "Presença de pai" e foi desenvolvida em 11 tópicos. Na validação de conteúdo e aparência, o Índice de Validade obteve escore global de 0,97. O alfa de Cronbach foi 0,92, indicando excelente confiabilidade de seu conteúdo. Pontuação global para legibilidade foi 74%, denotando fácil compreensão. **Conclusões:** o material teve êxito no processo de validação, podendo ser recomendado para os pais utilizarem-no durante o período pré-natal, promovendo a inclusão do parceiro e preparando-os para o parto e nascimento.

**Descritores:** Pai; Parto; Parto Humanizado; Tecnologia Educacional; Estudo de Validação.

## RESUMEN

**Objetivos:** construir y validar cartilla educativa para promoción del involucramiento de padres en el parto y nacimiento. **Métodos:** estudio metodológico desarrollado en cinco etapas: diagnóstico situacional; levantamiento bibliográfico; construcción de ilustraciones, esbozo, diseño y textos; validez de contenido y apariencia por jueces (25 especialistas) y cálculo del índice de Legibilidad de Flesch; y validación con el público objeto (12 padres). Considerado Índice de Validez de Contenido mínimo de 0,80. **Resultados:** la cartilla intitulada "Presencia de padre" y fue desarrollada en 11 tópicos. En la validez de contenido y apariencia, el Índice de Validez obtuvo escore global de 0,97. El alfa de Cronbach fue 0,92, indicando excelente confiabilidad de su contenido. Puntuación global para legibilidad fue 74%, denotando fácil comprensión. **Conclusiones:** el material tuvo éxito en el proceso de validación, pudiendo ser recomendado a padres utilizarlo durante el período prenatal, promoviendo la inclusión del compañero y preparándolos al parto y nacimiento.

**Descriptor:** Padre; Parto; Parto Humanizado; Tecnología Educacional; Estudio de Validación.

## INTRODUCTION

Throughout history, the father figure has been little involved in the birth scenario, the result of the traditional care model and a culture of gender distinction, in which the woman is considered responsible for pregnant, giving birth, raising and caring for children. However, several benefits are being reported with regard to the father's involvement in events related to the pregnancy and puerperal cycle and the first years of the child's life<sup>(1-3)</sup>.

In the last few years, public policies have been implemented in Brazil with the aim of qualifying delivery and birth assistance so that women can experience these moments in a more dignified, respectful, and humanized way<sup>(4-6)</sup>. The Federal Law 11.108/05 guarantees the right of every woman in labor to the presence of a companion of her choice during labor, delivery and immediate postpartum. A Brazilian study has already shown that, in most cases, the companion himself is chosen as a companion<sup>(7)</sup>. Stimulating and promoting the father's involvement during these events are considered positive strategies and should be encouraged by health professionals<sup>(7-8)</sup>. The World Health Organization (WHO) itself considers necessary the inclusion of the male figure during pregnancy, birth and development of their children, and should be stimulated from the prenatal consultations<sup>(9)</sup>.

Qualified multidisciplinary prenatal care is of utmost importance, because besides aiming at maintaining the integrity of the conditions of maternal and fetal well-being, it is during the consultations that one should guide the physical and psychological preparation for childbirth and stimulate the father's participation in the consultations, birth and development of their child<sup>(8,10)</sup>.

National and international research recognizes the need for the father's involvement in the birth of their child so that they become an active participant in supporting the woman during both the pregnancy and the birth process<sup>(1-3,11-12)</sup>. The current model of care, especially in Latin America, considers paternal participation practices lacking previous preparation, which can generate stressful situations and emotional ambivalence in men<sup>(11)</sup>. This conjuncture is also experienced in Singapore<sup>(12)</sup>. However, in Chile, the inclusion of the father as an active agent during childbirth has gained relevance in the last two decades<sup>(13)</sup>.

In this context, studies<sup>(2-3)</sup> reinforce that the accompaniment of the pregnant woman by her partner can contribute positively to the process of parturition in terms of contributing to her well-being, pain support, and progression of labor. The parent is an important figure, because for the transition from fatherhood, the emotional bond between father and child is essential. It is emphasized that this involvement and interaction should happen naturally and spontaneously, and should be encouraged by health professionals, because although the birth process belongs to the female body, the man as a father also needs to participate, assist in decisions if they need to be made and assume their family responsibilities<sup>(2)</sup>.

Prenatal visits by health professionals are a great opportunity to stimulate this interaction, but tools are needed to foster parental involvement and inclusion<sup>(1,10)</sup>. However, the booklet can support the practice of nurses for this approach during prenatal care, mediating its use for a better understanding, and be made available to parents for reading at home. The use of printed educational

technologies is a viable alternative for health information, and can open new paths for health promotion in a shared construction of knowledge. It is a useful, low-cost, and easily applicable resource. It is worth noting that there is a shortage of educational technologies related to the promotion of paternal involvement and preparation of fathers for parturition.

Therefore, the construction and validation of the educational booklet aimed to contribute to the promotion of paternal involvement in labor and birth and to a better preparation and guidance of fathers in the gestational period and parturient process, in order to favor the empowerment of those involved.

## OBJECTIVES

To develop and validate an educational booklet for the promotion of fathers' involvement in labor and birth.

## METHODS

### Ethical aspects

The ethical precepts of the research were respected. The study was submitted to the Scientific Committee of the municipality and, subsequently, to the Research Ethics Committee of the State University of Vale do Acaraú, and was approved. The research ensured ethics and dignity throughout its development, with respect for Resolution 466/2012 of the National Health Council, which establishes standards for studies with human beings.

### Study design, site and period

This is a methodological study with a quantitative-qualitative approach, described according to the framework of quality improvement studies SQUIRE of the EQUATOR network. Echer's theoretical framework was used<sup>(14)</sup> in the elaboration of the technology and the Modified On-line Delphi Technique<sup>(15)</sup> for content and appearance validation.

The process for developing the technology occurred through the following steps: 1) elaboration of the project; 2) situational diagnosis and bibliographic survey; 3) elaboration of the educational booklet; 4) validation by expert judges in the health area and by the target audience; 5) calculation of the Flesch Readability Index - FRI.

The suitability of written communication used in printed educational technology was based on theoretical and methodological references<sup>(16-17)</sup> that highlight aspects to be considered when developing educational materials, such as language, illustration, layout, design, and cultural appropriateness of the educational material.

The development and validation of the booklet were carried out in a city (national reference in Primary Health Care) of the northern zone macro-region of the state of Ceará, Brazil; and occurred between the period, from January 2018 to February 2019.

### Study population or sample; inclusion and exclusion criteria

In the situational diagnosis stage, 14 pregnant women and seven fathers participated, selected by convenience, according

to the following criteria: having prenatal care at the health unit and participating in the service's groups for pregnant women.

In the content and appearance validation stage, the expert judges were selected according to the following criteria: having a bachelor's degree in nursing, a master's and/or doctorate; having research on the themes of obstetric nursing, women's health and/or humanization of childbirth; working in the areas of women's health, obstetric nursing, humanization of childbirth, prenatal care and/or validation of instruments; and having an updated résumé in the last 12 months.

The curricula of the nurses were consulted through the Lattes Platform of the National Council for Scientific and Technological Development (CNPq) and the experts were included when they reached 5 points according to the following criteria adapted from other authors<sup>(18-19)</sup>: dissertation or thesis in the area of interest (2 points); graduation or specialization monograph in the area of interest (1 point); participation in groups/projects in the area of interest (1 point); teaching experience in the area of interest (0,5 point/year); practical experience in the area of interest (0.5 point/year); work orientation in the area of interest (0.5 point/work); authorship of works in the area of interest published in periodicals (0.25 point/work); participation in evaluation boards of works in the area of interest (0.25 point/work). The following areas of interest were considered: obstetric nursing; humanization of childbirth; construction and validation of educational materials, health technologies, and prenatal care. In the first validation stage, 42 judges participated, and in the second stage, a total of 25 experts were evaluated.

In the validation stage of the booklet with the target audience, 12 parents participated, meeting the minimum number of informants described in the literature<sup>(20)</sup>. In this case, the inclusion criteria were: being the companion of a pregnant woman accompanied by the health unit; and being literate, that is, having at least four years of schooling.

### Study protocol

The first stage, called "situational diagnosis", occurred with the aim of getting to know the population for which the educational material was intended. Fourteen pregnant women and seven parents participated in this stage. Focus groups were conducted with the pregnant women and interviews with parents using a semi-structured script. The answers obtained in the interviews and focus groups were recorded and organized into categories to support the construction of the booklet.

In the second stage, a bibliographic survey was developed through an integrative review in the following databases: SCIELO - Scientific Electronic Library Online; LILACS - Latin American and Caribbean Literature on Health Sciences; MEDLINE - Medical Literature Analysis and Retrieval System Online, BDNF - nursing database; and publications of the Ministry of Health. The IR aimed to analyze the evidence available in the literature on parent preparation for labor and birth. The purpose of this research method was to gather the scientific knowledge already produced on the topic in question, which allowed searching, evaluating, and synthesizing this evidence for its incorporation into the research. In conducting the IR, the following steps were followed: development of the guiding question; literature search or sampling; data

collection; critical analysis of the included studies; discussion of results; and presentation of the integrative review.

The guiding question for the development of the integrative review was, "What is the main evidence available in the literature on the information needed to prepare couples for labor and birth?"

In the third stage, the preliminary version of the educational booklet was built with the creation of the texts, illustrations, layout and design, seeking to meet the knowledge needs identified in the situational diagnosis phase and in the current scientific literature.

A technical professional (graphic designer) was used to prepare the layout of the booklet, so that the figures were attractive, easy to understand, and consistent with the cultural context of the target population. For the elaboration of the images, the programs Corel Draw Essentials was used to draw and Adobe Photoshop to color the figures; and, for the layout, the program Adobe InDesign was used, so that, after the elaboration of each page with the proposed figures and texts, the material was sent to the researchers, so that they could perform a previous evaluation of the material elaborated and suggest modifications.

In the fourth stage, corresponding to the validation of content and appearance, there were two successive rounds of assessments by expert judges from all states of Brazil, selected from the CNPq database. The analysis of the consensus and disagreement was done by calculating the Content Validity Index - CVI. The level of understanding of the technology was also analyzed at this stage, by calculating the FRI.

The judges evaluated the instrument by determining its relevance and comprehensiveness, i.e., if each concept was adequately covered by the set of items and if all dimensions were included, being able to suggest adjustments, inclusion or exclusion of topics. Six domains were evaluated: objective, content, relevance, functionality, usability and efficiency.

After the specialists' evaluation, the material was submitted to a linguistic and grammatical revision. Then, the FRI was calculated, which evaluates the degree of readability of the texts on a percentage scale from 0 to 100. The texts were selected and evaluated by the text analysis program available in Microsoft Office Word, version 2010. The FRI of each domain of the primer was measured, and sentences with FRI between 50% and 100% were considered acceptable. The FRI between 75% and 100% was classified as "very easy", which refers to public with reading schooling from 4th grade on; between 50% and 74% was considered "easy", for public with average schooling of 8th grade.

The fifth stage, called "validation with target audience", was carried out with parents who received the booklet and answered a semi-structured form whose objective was to capture their opinions regarding the organization, writing style, appearance, and the motivation for learning provided by the booklet built. The items with a minimum agreement level of 75% in the positive answers were validated. The percentage of agreement was calculated based on the number of participants who agreed, divided by the total number of participants, multiplied by 100<sup>(21)</sup>.

### Analysis of results and statistics

The analysis of the experts' consensus and disagreement occurred by calculating the CVI, which quantifies the proportion of

expert judges who agree on certain aspects of the material and its items, until consensus was reached. A four-point ordinal categorical Likert-type scale was used, ranging from: 1 - inadequate; 2 - not very adequate; 3 - adequate and 4 - very adequate. For data analysis, scores 1 and 2 were grouped in the inadequate classification; 3 and 4, as adequate. Topics that received a score of 1 or 2 were reviewed and modified.

To verify the internal consistency of the questionnaire applied to the judges in the validation of the primer, Cronbach's alpha was calculated. This is a statistical tool that determines, on a decimal scale from 0 to 1, how reliable the questionnaire applied in a validation process is. The minimum acceptable value to consider a questionnaire reliable is 0.7<sup>(22)</sup>.

## RESULTS

For the situational diagnosis, two focus group sessions were conducted with 14 pregnant women, mostly primigravidae and adolescents, who participated in the groups for pregnant women at the health unit. Their ages ranged from 15 to 34 years, with an average of 22 years. As for occupation, all were unemployed. Regarding education, nine had elementary school education, and five had completed high school.

At the beginning of the sessions, the women seemed shy and had some difficulty in showing their conceptions; however, with the workshops and dynamics, a greater involvement between the pregnant women and the moderator was gradually perceived. Through the activities developed, they expressed their opinions and perspectives about the proposed questions.

In order to know the perceptions of parents regarding the theme addressed in this research and identify subsidies for the construction of the educational technology, seven parents were interviewed through home visits, accompanied by the community's CHA. Their ages ranged from 18 to 37 years old, and the average was 23 years old. Three were formally employed and four were unemployed. Of those interviewed, two had elementary school education, four had incomplete high school education, and only one had completed it. Only two parents already had other children.

Through the focus groups with the pregnant women and the interviews with the fathers, knowledge gaps were identified related to the law of the companion, doubts about the benefits of the father's participation, non-pharmacological methods for pain control and postpartum and newborn care.

Regarding the integrative review, the survey generated 1,141 productions related to the study. After applying the inclusion and exclusion criteria defined and analyzing the titles correlated with the theme, we obtained an initial sample of 936 studies, whose abstracts were read and analyzed according to the research objectives. A total of 731 studies were excluded for not addressing the subject related to the review's objective. Of the 205 studies selected, 108 did not fit the research, 16 were not available, and 39 were repeated, resulting in a final sample of 52 publications.

All this data collection subsidized the construction of the printed and pictorial content of the booklet. For the elaboration of the images, the programs Corel Draw Essentials was used to draw and Adobe Photoshop to color the figures; and the layout was made in Adobe InDesign.

The booklet developed was composed of 11 topics, with the following themes: the law on caregivers; benefits of paternal participation; getting ready to accompany the birth of your child; labor: pain control methods; father's involvement in normal childbirth; childbirth positions; first contact with the newborn; father's involvement in cesarean sections; good practices for labor and birth; "And after childbirth?"; and encouraging fathers to breastfeed.

The cover of the educational booklet bears the title "Paternal presence: a booklet for father involvement in labor and birth" and the main characters that illustrate the material. The first pages contain information about the booklet, a catalog, a summary, and a presentation of the technology. On the back cover, the institution to which the material is linked is indicated. On the back cover, the institution to which the material is linked is indicated. On the catalog sheet, there is information about the authors of the booklet, the collaborators, and the professional responsible for the illustration and layout, and the institutions supporting the study. The last pages of the booklet were designed so that parents could write down their doubts and describe the experience of participating in the birth of their child.

In the process of validation of the educational technology, with the first Delphi stage, 201 specialist judges received, via e-mail, the invitation to participate in the validation and the Google Forms link, which included the first elaborated form. Of these, 42 responded by accepting to participate and signing the FICT.

Of the 42 experts, 36 (85.7%) were female, 6 (14.3%) were male, 21 (50%) had a master's degree, 19 (45.2%) had a doctorate, and two (4.8%) had a post-doctorate. About the time of graduation, the majority (16; 38.1%) had between 11 and 20 years of graduation. Regarding the age range, most of them (18; 42.8%) were between 30 and 39 years old. When associating the main activities developed by the specialists, it was identified that 25 (59.5%) of the nurses worked in teaching; 12 (28.5%), in assistance; three (7.1%), in management; and two (4.8%) worked specifically with research. Regarding the time in the function, the period of 5 to 10 years (16; 38.1%) stood out, followed by 11 to 20 years (13; 30.9%). As for the age of the participants, the average age was 41 years.

The form was used to validate the content and appearance of the technology based on the six domains and 21 items that comprised it. Along with the form, the technology was attached to be evaluated. When grouping the answers in the first validation step, it was evident that all experts showed a 90%+ agreement regarding the items and domains of the electronic form, as shown in Table 1.

The second Delphi round brought together a total of 25 expert judges, of which 24 (96.0%) were female, 1 (4.0%) was male, 13 (52.0%) had master's degrees, 10 (40.0%) had PhDs, and two (8.0%) had post-doctoral degrees. Regarding the time of graduation, the majority (10; 40.0%) had between 11 and 20 years of graduation. When associating the activities developed by the specialists, 14 (56.0%) worked in the teaching area, seven (28.0%) in assistance, three (12.0%) nurses worked specifically with research, and one with management (4.0%). Regarding the time in the position, the period of 5 to 10 years (12; 48.0%) stood out, followed by 11 to 20 years (11; 32.0%). The average age of the participants at this stage was 39.5 years.

**Table 1** – Percentage of agreement/non-agreement of the expert judges regarding the content of the domains in the 1st and 2nd Delphi stage

| Domains  |               | Inadequate |     | Adequate |      |
|----------|---------------|------------|-----|----------|------|
|          |               | n          | %   | n        | %    |
| Stage I  | Objective     | 2          | 4.8 | 40       | 95.2 |
|          | Content       | 3          | 7.2 | 39       | 92.8 |
|          | Relevance     | 1          | 2.4 | 41       | 97.6 |
|          | Functionality | 1          | 2.4 | 41       | 97.6 |
|          | Usability     | 2          | 4.8 | 40       | 95.2 |
|          | Efficiency    | 0          | 0   | 42       | 100  |
| Stage II | Objective     | 0          | 0   | 25       | 100  |
|          | Content       | 1          | 4.0 | 24       | 96.0 |
|          | Relevance     | 0          | 0   | 25       | 100  |
|          | Functionality | 0          | 0   | 25       | 100  |
|          | Usability     | 0          | 0   | 25       | 100  |
|          | Efficiency    | 0          | 0   | 25       | 100  |

**Table 2** – Results of Cronbach's  $\alpha$  and Content Validity Index in each domain

| Domains  |               | Cronbach's $\alpha$ | CVI* |
|----------|---------------|---------------------|------|
| Stage I  | Objective     | 0.65                | 0.95 |
|          | Content       | 0.67                | 0.92 |
|          | Relevance     | 0.72                | 0.97 |
|          | Functionality | 0.60                | 0.97 |
|          | Usability     | 0.81                | 0.95 |
|          | Efficiency    | 0.75                | 1    |
|          | Total         | 0.90                | 0.96 |
| Stage II | Objective     | 0.75                | 1    |
|          | Content       | 0.77                | 0.96 |
|          | Relevance     | 1                   | 1    |
|          | Functionality | 0.88                | 1    |
|          | Usability     | 0.83                | 1    |
|          | Efficiency    | 0.84                | 1    |
|          | Total         | 0.92                | 0.99 |

\*Content Validity Index.

The degree of agreement among the specialists is also presented in Table 1, by means of quantities and percentages, according to the answers received.

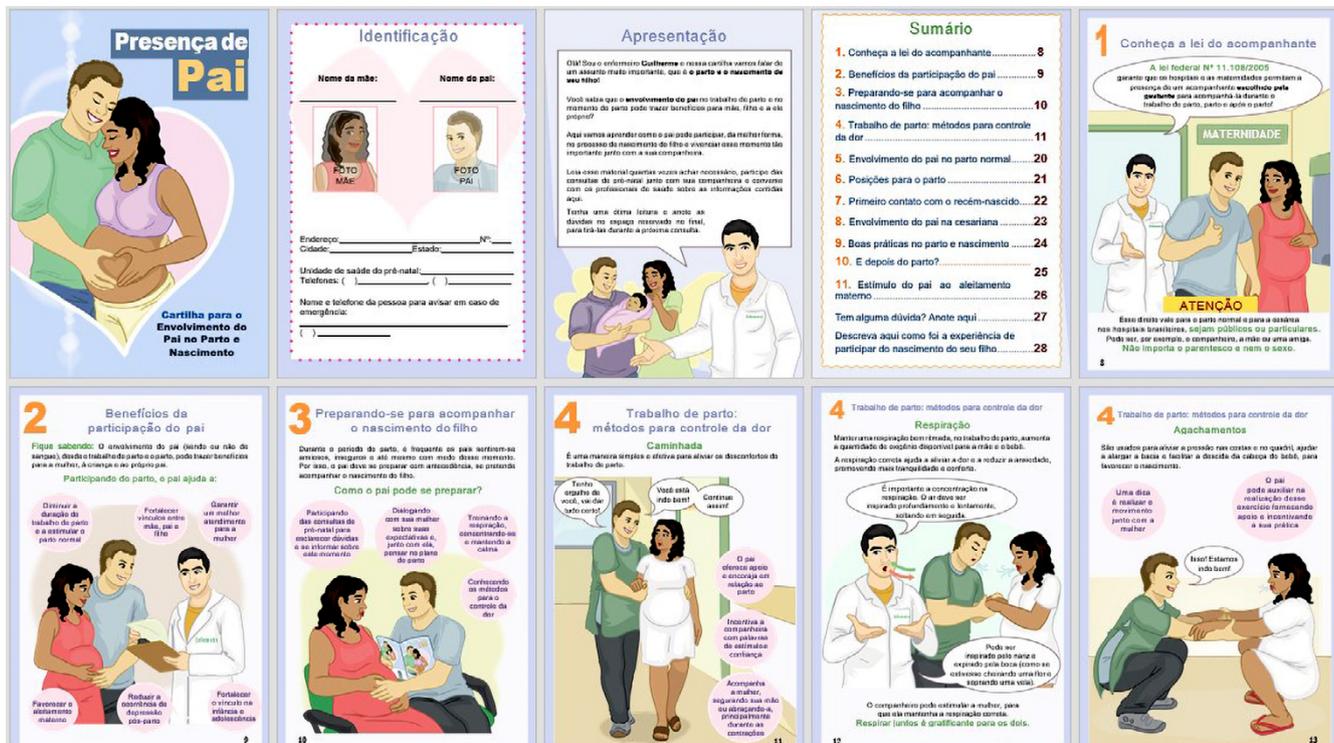
In the two evaluation rounds, the experts from federal and state universities in the Southeast Region stood out, followed by the Northeast Region, contributing significantly to the qualification of the primer validation process.

In the second Delphi stage, we noticed an increase in the percentage of agreement among the judges when compared to the first round, since most of the domains obtained 100% acceptance. Only one evaluator did not agree with an orientation presented in the booklet about correction of perineal tears. However, after adjustments, the expert was contacted via e-mail and validated the corrections. Thus, the booklet was considered validated and no further rounds were necessary.

In the first and second round, with regard to CVI, a value of 0.96 and 0.99 was obtained, respectively. The overall CVI was 0.97, indicating content and appearance validity (Table 2).

Regarding Cronbach's alpha, a value of 0.90 was reached in the first round and 0.92 in the second round, indicating excellent internal consistency of the validation questionnaire.

Although the technology has reached an alpha value of 0.90, which points to excellent reliability regarding its content, and even though the instrument has been validated with more than 90% of agreement between the evaluators in the first round of the Delphi technique, the items of the domains showed some variations as to the alpha and CVI values, drawing attention to be revised in the booklet. In addition, the judges proposed some suggestions to improve the content and appearance of the technology. The suggestions were recorded in the electronic form itself, according to the domains it contains.



**Figure 1** – Cover and pages of the final version of the booklet after being validated

In the first and second Delphi stages, all the evaluators' comments were organized and grouped into categories: inclusion, exclusion, and adequacy. The suggestions were about: replacement of technical terms; reformulation of illustrations; simplification and rewording of sentences to make the language clearer; addition of information they deemed necessary, among others. Most of these proposals were taken into consideration, analyzed, and accepted, based on the evidence in the literature. Figure 1 shows the cover and some of the themes addressed in the final version of the booklet.

The Flesch Readability Index was applied with the purpose of analyzing the existing content in the technology, if it was adequate for all levels of schooling, obtaining an FRI of 74%. Therefore, the booklet is considered adequate for reading by an audience of up to eight years of schooling, configuring itself as "easy" to understand intellectually.

In the target audience validation performed with 12 parents, the educational booklet was considered relevant, explanatory, and adequate. The agreement about the content and appearance of the educational material was unanimous, with no suggestions for changes to be implemented.

After all the validation process with experts and target audience, the final version of the booklet remained with 11 topics and consisted of 32 pages, of which 22 were content pages, seven pre-textual and post-textual pages, and three blank pages.

## DISCUSSION

The development of the educational technology of this study aimed to promote the involvement of parents in events that comprise pregnancy, parturition, and birth of their children. It was built according to scientific criteria, referenced by Echer, and validated through the assumptions of the Delphi technique. The aim was to get to know the reality of the target audience through a situational diagnosis.

With this diagnosis, it was possible to identify what is known about the theme, the gaps, the need for information, and the use of the booklet as an educational technology. This conferred a differential to the material and was essential to the construction process. Similar studies in Brazil have conducted surveys with the target audience about their knowledge on the subject, in the preparation phase of an educational manual<sup>(23-25)</sup>.

The validation of the educational material by the experts had the purpose of evaluating the level of agreement of the judges regarding the elements that compose the technology, to bring it closer to the reader's reality, and conferred scientific recognition regarding the quality of the educational booklet.

All judges agreed that its content has the capacity to promote paternal involvement, considering it appropriate for use. The comprehension of the texts and coherence of the illustrations also obtained satisfactory CVI scores, indicating that the information used is appropriate. This evaluation methodology is observed in several publications on the construction and validation of educational technologies<sup>(18-20,23-24)</sup>. The overall CVI of the educational material showed a high level of agreement, corroborating other Brazilian methodological studies on the development of educational technologies that identified similar findings<sup>(18-20,25-27)</sup>.

It is important to highlight that, in the validation stages, modifications were made to the educational booklet to bring it closer to the reality of the target audience. This is because an educational technology directed to health promotion and education needs to be adapted to the reality of the recipients, seeking to describe and clarify what the literature exposes<sup>(16-18)</sup>. In this sense, national and international researchers emphasize that the intended objectives need to be clear and succinct, considering that they propose to guide the instructional design and contribute to the evaluation of the teaching-learning process<sup>(17-18)</sup>.

The degree of readability, performed after validation with experts, showed a satisfactory and coherent percentage for understanding the writing of the booklet. Measuring the degree of readability of an educational tool is necessary to avoid learning limitations due to low education; and educational technologies can have more credibility and acceptance when there is the participation of experts on the subject and members of the target audience<sup>(26)</sup>.

Authors argue that the validation of the educational material with the population that experiences the theme addressed in it needs to be considered in the development of educational technologies: it is a necessary attitude and an important gain for the researcher and the team involved<sup>(27)</sup>.

In the literature, there are several studies related to educational manuals, most of which are focused on guidance for pregnant women about pregnancy, childbirth and puerperium. However, no educational material directed to men was identified whose purpose was to promote their involvement in the birth scenario. An international study conducted in Singapore showed that educational programs to support fathers during the perinatal period are scarce and reinforced the need for educational materials based on easily accessible technology capable of supporting fathers during this period<sup>(12)</sup>.

Thus, it is necessary to build educational materials that provide the partner with subsidies for a greater and better support to the woman. It is necessary to take into account that these technologies must be used to favor the participation of these couples in the educational process, contributing to the construction and maintenance of family ties as well as increasing the empowerment of those involved.

It is believed that the information included in the booklet has the capacity to promote paternal involvement, adding more knowledge and autonomy during the monitoring of parturition, and the use of this technology by nurses during prenatal care is recommended. It is expected that this tool will be used in the daily life of fathers and health professionals and provide an adequate support for educational actions in the community.

It is important that new studies be developed with the material constructed, such as clinical trials, to verify its efficacy with regard to paternal involvement during the stages of pregnancy and puerperium.

## Study limitations

It is worth pointing out the lack of validation by specialists in graphic design; and the elaboration of the booklet based on a situational diagnosis that took into account the local and

cultural reality of only a certain population. Furthermore, there was a limitation in its potential reach, since illiterate and visually impaired men were excluded.

Another limitation is the fact that only cisgender men have been contemplated in the structure of the technology. Therefore, trans men, who may become pregnant if they have the desire and physiological conditions to do so, were not included or contemplated in this direction of the technology.

### Contributions to the field of nursing and health

It is believed that the use of the booklet will promote the insertion and involvement of men from prenatal care, delivery, and postpartum. It will also contribute to a greater production of care in nursing and advances in local public policies for men's health.

It is expected that the technology will be used by fathers, subsidizing prenatal consultations and preparing them for the birth period. It is important to disseminate the information contained in the booklet to the target audience during the pregnancy period in order to promote paternal participation in events that comprise pregnancy, labor, birth, and the puerperium.

### CONCLUSIONS

The educational technology "Paternal presence: a booklet for father involvement in labor and birth", after going through a

rigorous evaluation process by expert judges and representatives of the target audience, was considered validated regarding its content and appearance, showing the judges' satisfaction with the material and the homogeneity in the evaluations.

After validation of content and appearance, the final version of the booklet was checked by the FRI, being classified as "easy to read" and suitable for an audience with an average of 8th grade education. Therefore, it should be considered in the context of health education.

Subsequently, we intend to develop a clinical trial to verify the effectiveness of the booklet in the knowledge, attitude, and practice of the inclusion of fathers in events that comprise the pregnancy and puerperium cycle. This study will be followed by the clinical validation.

### SUPPLEMENTARY MATERIAL

The research was developed within the Academic Masters in Family Health at the Federal University of Ceará. It can be fully accessed through the link: <http://www.repositorio.ufc.br/ri/handle/riufc/36785>

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