






Development and validation of educational-assistance technology for self-care for pregnant trans men during prenatal care


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Abstract

Objectives: to describe the process of developing and validating the content of an educational-assistance technology for self-care for pregnant trans men during prenatal care.

Methods: this is a methodological study with a quantitative approach that encompassed two main stages, namely: i) development of the "Pregnancy Handbook" technology; and, ii) validation of content and appearance by a committee of expert judges. In the validation stage, the Delphi technique was applied to a group of seven judges, who responded to a questionnaire using the Likert scale. To evaluate the suitability of the instrument, the Content Validity Index (CVI) and the Content Validity Coefficient (CVC) were used.

Results: the educational-assistance technology evaluated achieved a satisfactory CVC (0.90) and a CVI with excellent agreement (0.94), and showed excellent agreement between the expert judges regarding its content and appearance.

Conclusion: the validated educational-assistance technology brings potential in prenatal care for trans pregnant women in the context of comprehensive health care.

Key words Transgender person, Pregnancy, Prenatal care, Interdisciplinary placement, Health technology



Introduction

Transgender people are individuals which gender identities disagree with those designated based on the biological sex, commonly before or previous to their birth.¹ The term “trans person” encompasses a broad range of identities, including trans women and men, transvestites, non-binary people, agender and gender-neutral.^{2,3}

In the healthcare context, the debate towards the pregnancy-puerperal process of trans men still implies challenges when considering the assurance of the access to healthcare services and the right to qualified professional care.⁴⁻⁶ Pregnant trans men are subject to a larger variety of negative feelings on this stage, due to corporal modifications and the return of secondary sexual characteristics that are socially perceived as female.⁷

Hetero-cis-normativity has been the main category to approach the reproductive health of trans men, to the extent that it conceives social relationships from the heterosexual perspective of bodies and the idea of cisgender as it were presumed and supposed to all people.⁶⁻⁸ Such perspective makes trans men pregnancy invisible and conceives prenatal care in a cis-hetero logic.⁹

Prenatal care comprehends an essential stage in obstetric and multidisciplinary support in healthcare during pregnancy, birth and puerperium.¹⁰ For pregnant trans men, prenatal should include specific guidelines, such as type of delivery and gender dissidence, breastfeeding, the use of microdosing testosterone in pregnancy according to the case, the return of secondary female characteristics, social impression and related subjects, among other particularities.^{6,8}

In the reproductive health context, the Assistive Educational Technologies (AETs) favor expanded and informative communication among professionals and pregnant individuals, and contribute to assistive and educational health practices under the sexual and gender diversity perspective.^{11,12}

In Brazil, however initiatives on scientific production of AETs focused on pregnancy and prenatal care of trans men are identified,¹³ the materials and educational handbooks with obstetric guidelines and pregnancy care available on the Ministry of Health, for example the Pregnant Woman's Booklet¹⁰ and the Technical Handbook,¹⁴ do not include the follow up of trans men. This study is justified for the importance of debating and producing knowledge focused on trans men pregnancy. Accordingly, the objective of the study was to describe the development process and content validation of assistive educational technology for the selfcare of pregnant trans men in the prenatal period.

Methods

Methodological research with quantitative approach carried out between February and April 2023, by means of two stages: the elaboration and posteriorly, the validation of both the content and appearance of the educational technology denominated “Pregnant Men's Booklet”, focused on prenatal care and selfcare of pregnant trans people.

The research was carried out in the municipality of Mossoró, located in the West Region of the state of Rio Grande do Norte. With an estimated population of 264,477 inhabitants, the municipality has a broad network of healthcare services, including Basic Health Units (UBS – Portuguese acronym), polyclinics, maternity hospitals and regular hospitals. In 2023, the tertiary maternity hospital performed a mean of 1640 births. With regard to the health of the LGBT+ population, the municipality has an outpatient department and a family planning clinic, both located in the maternity hospital, assisting the sexual diversity.

We adopted the Pasquali's¹⁵ theoretical methodological framework in the elaboration of the technology, which focuses on the theoretical and analytic poles. The theoretical pole comprises the process of theorization of the construct of interest and the assessment made by judges of the elaborated technology. The analytic pole, in turn, encompasses the stage of the statistical treatment in order to estimate the content validation of the technology.^{11,15}

The idea of elaboration of educational assistive technology came from the prototype of the booklet proposed in the master's thesis “*Cartografias da Produção de Cuidado em Saúde à População LGBT+ no Município de Mossoró (RN)*”.¹⁶

The initial version of the Booklet was based on the topics of the sixth edition of the Pregnant Women's Booklet¹⁴ of the Ministry of Health and on the holding of a collage workshop with the professionals of a maternity hospital and the LGBT+ users who received care in the service.¹⁶ This workshop stood out as an original and precursor strategy focused on prenatal care of pregnant trans men.

The stage of content and appearance elaboration included reformulations and complements on the text of the booklet, with additions discussed in scientific papers and international protocols regarding the main subject of the study, selected from the literature review in the following databases: Medical Literature Analysis and Retrieval System Online (MEDLINE) and Latin American and Caribbean Literature on Health Sciences (LILACS).

In the validation stage, we selected seven health professionals from Mossoró/RN experienced in treating

trans people, using a convenience sample. Next, criteria such as minimum specialist qualification, acting on prenatal care and experience in the area. The identification of participants occurred by means of the municipal health secretariat and teaching institutions, resulting in 12 invitations, of which, five did not respond or were unavailable. Therefore, the committee of judges was composed of seven professionals.

We referred to the email of participants: the Free Informed Consent Form (TCLE – Portuguese acronym); the validation tool via Google Forms and the initial version of the booklet. The content and appearance validation stage occurred in the period between March and April 2023 in a single round, by means of an adapted tool.¹¹

The instrument contemplated three main items, namely 1) sociodemographic and educational data of participants; 2) assessment questionnaire of the booklet's appearance; 3) assessment questionnaire of the content about textual items included in the booklet. Each enunciate was answered with the Likert scale, where each assessed item could receive a score from one to four (1- Inadequate: does not meet what was proposed; 2 – Partially adequate: does not meet what was proposed, but can become adequate with alterations; 3- Adequate: meet what was proposed, but can be improved; 4 – Totally adequate: totally meet what was proposed).

Data were organized in an electronic sheet from Microsoft Excel software, version 2020, and posteriorly, they were analyzed by means of descriptive statistics. In order to determine the agreement of judges in relation to the Pregnant Men's Booklet,¹⁰ we applied the Content Validity Index (CVI) and the Content Validity Coefficient (CVC).

The CVI is used to measure the proportion of judges who agree with the instrument and its items. The index score is calculated by means of the agreement of specialists in relation to items highlighted as “3 or 4”. The index of agreement between judges should be at least 0.78.^{17,18} The CVC is an index to assess the interpretation of items and scales by a group of specialists in the construct measured by the instrument.^{17,18}

The project was submitted and approved by the Research and Ethics Committee (CEP – Portuguese acronym) of the University of the State of Rio Grande do Norte, registered with the CAAE number 54407621.6.0000.5294 and approved in March 29, 2022, under opinion nº 5.319.015.

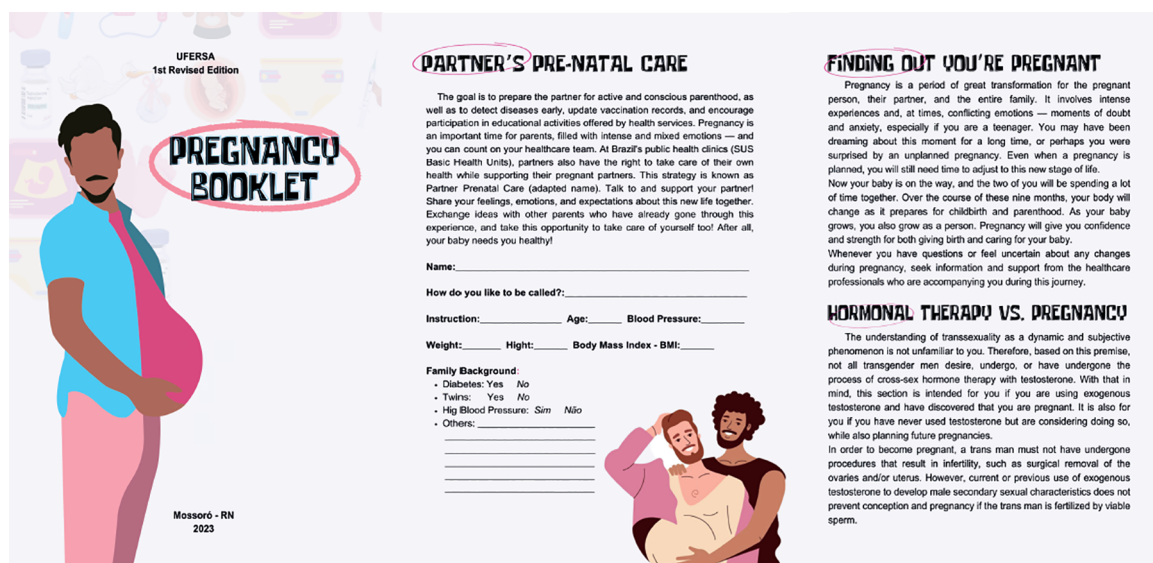
Results

The pregnant trans booklet was designed in attempt to print a color palette that refers to the colors to the flag representing the trans population and included images/illustrations of trans men with different profiles of skin color, ethnicity, sexuality and marital status, by virtue of the importance to reinforce the prerogative of diversity and inclusion (Figure 1).

Regarding the structure, the spaces related to the personal identification sought to encompass the exposition of the social name to the detriment of the civil name, since there are people who still have not started the rectification process. Moreover, we sought to highlight the pronouns and the other forms of identification that the pregnant men considered adequate. We improved the “Know your rights” item of the booklet, aiming to add other rights of the trans person using the Unified Health System (SUS – Portuguese Acronym) in this space.

Figure 1

Illustrations on the cover, title page and the topic “Pregnancy and hormone therapy in pregnant trans men” from the “Pregnant Men's Booklet”. Mossoró (RN), Brazil, 2023.



The cross-hormone therapy is adopted by several trans patients. Thus, we included a topic focused on exogenous testosterone use by pregnant trans men. In this item, we addressed the teratogenic potential of the hormone therapy during pregnancy, as well as the most adequate moment for its suspension – in the case of those who already use cross-hormone therapy and decide to become pregnant –, and when to resume the therapy after pregnancy.

Another item from the booklet focused on psychological aspects of pregnancy, aiming to highlight potential mental complications related to a phenomenon originating in bodily distress stemming from the perspective of pregnancy as an exclusive process for cisgender women (Figure 2).

Under the perspective of recognizing the importance of the access to narratives of transexual men who already experienced this situation and were able to overcome its barriers, we included a topic based on a portfolio, with images of trans men in diverse stages of the pregnancy-puerperal cycle. The inclusion of inspiring models aimed to provide higher comfort to the pregnant individual. However, the instrument highlights that, in cases of intense emotional affliction, the search for adequate psychological and medical assistance is recommended.

Furthermore, the literature consulted highlighted other aspects that contribute to gender dissidence, emphasizing the role of physical changes in this process. We added a topic centered on bodily changes related to pregnancy and its challenges. In the same topic, we addressed possible strategies capable of helping the trans man with the manner that he wants to be seen by society, attempting to remind him that he is not limited to only one

during the entire gestational process, and he may opt to change or combine different strategies over time.

The validation process of the booklet was performed by a group of seven judges, mostly female (four), residing in the municipality of Mossoró (RN) (seven), with a degree in Medicine (seven) with a period of qualification and professional experience up to 19 years (six). With regard to the academic degree, the specialization category predominated (five), followed by master's degree (one) and Ph.D (one), being in the Family Medicine area (four), Gynecology and Obstetrics (two) and Endocrinology (one).

From the answers of the expert judges, it was possible to calculate the CVI by means of the number of answers three and four marked by the participants in the research. We obtained a total CVI of 0.94, which indicated optimal agreement of judges in relation to the prototype of the Pregnant Men's Booklet. However, we verified that the item 09 (Inclusion of the topic "How to dress during pregnancy", concerning the options of clothes adequate to the strategy of behavior in pregnancy opted by the trans man) had a CVI of 0.57, which is inferior to what the literature recommends (Table 1).

However, studies that scientifically verified the importance of addressing clothes used by the pregnant transgender during prenatal care were not found. Thereby, we excluded the topic referred by item 09 from the final booklet and the dismissal of a new round, since all other items reached a CVI above 0.80.

In the guidelines of fulfillment of the questionnaire, the judges could justify the motivation of attributing the "partially adequate (2)" and or "inadequate (1)" scores

Figure 2

Illustrations of the topics psychological and physical aspects, and breastfeeding in pregnant trans men from the "Pregnant Men's Booklet". Mossoró, (RN), Brazil, 2023.



Table 1

Items from the questionnaire and the respective answers of judges and the Item-Level Content Validity Index (I-CVI). Mossoró (RN), Brazil. 2023.								
Questionnaire Items	Judge 1	Judge 2	Judge 3	Judge 4	Judge 5	Judge 6	Judge 7	CVI
1. Adaptation of topics included in the Pregnant Women's Booklet (Ministry of Health, 2022).	3	3	4	4	3	2	3	0.85
2. Inclusion of specific rights of transgender people in the topic "Know your rights" of the Booklet.	4	3	4	4	4	3	3	1
3. Inclusion of spaces for pregnant men to highlight their social names, their pronouns and whether previous rectification occurred or if they desire to rectify documents.	4	4	4	1	4	4	3	0.85
4. Inclusion of the topic: "Hormone therapy and Pregnancy", which discusses cross-hormone therapy with exogenous testosterone during pregnancy.	4	4	4	4	4	3	4	1
5. Inclusion of the topic: "Resuming hormone therapy", which discusses the effects of cross-hormone therapy with exogenous testosterone during breastfeeding and recommends the assisted resume, done by the healthcare team.	4	4	4	4	4	4	4	1
6. Inclusion of the topic: "Specific psychological aspects of pregnant trans men", which discusses social gender dysphoria.	4	4	4	4	4	4	4	1
7. "Inclusion of a portfolio with photographic records of other transgender men during pregnancy, delivery and postpartum in the topic: "Specific psychological aspects of pregnant trans men".	3	3	3	4	4	4	4	1
8. Inclusion of the topic: "Specific physical aspects of pregnant trans men", which discusses gender dysphoria of physical type and strategies for its challenge.	3	4	4	4	4	4	4	1
9. Inclusion of the topic: "How to dress during pregnancy", which discusses options of clothes adequate to the strategy of behavior in pregnancy chosen by trans men.	1	3	4	2	2	3	3	0.57
10. Inclusion of the topic: "Specific obstetric considerations", which addresses the particularities of labor of transgender men.	4	4	4	4	4	4	4	1
11. Inclusion of the topic: "Trans men and breastfeeding", which addresses the particularities of breastfeeding by transgender men, its benefits and recommendations for success in the process.	4	4	4	4	4	4	4	1
12. Inclusion of the topic: "Trans women and breastfeeding", which addresses the possibility of inducing breastfeeding in transexual partners of pregnant men.	4	3	4	4	4	4	4	1
TOTAL CVI								0.94

I-CVI = Item-level Validity Content Index; Total CVI = Total Content Validity Index.

to items, in case of doing so. Furthermore, they could also criticize and/or suggest the general structure of the booklet in the sector related to this purpose, in the end of the questionnaire.

Based on the critical assessment of judges in relation to the Pregnant Men's Booklet, we elaborated a synthesis chart, which detailed the items and their respective changes, performed in order to become adequate in relation to the suggestions made. Mostly, the rectifications approached aspects regarding design, structure and content of the document, aiming to improve the formulation of the final version of the booklet (Table 2).

The instrument used to validate the Pregnant Men's Booklet demonstrated a 0.90 CVC, considered satisfactory, and a 0.94 CVI, which evidenced an excellent concordance among expert judges concerning content and appearance.

Discussion

From the contributions of professionals during validation, the final version of the Pregnant Men's Booklet was

reached, contemplating the fundamental aspects of prenatal care of trans men, which include: information on trans people rights in SUS, documents concerning social identity of pregnant men, guidelines regarding cross hormone therapy in pregnancy/puerperium, as well as physical and physiological aspects inherent to pregnant trans men and information on breastfeeding by trans men.

The production and publication of printed educational assistive technologies, such as booklets, brings their potential in the context of healthcare promotion, by means of the strengthening of the communication of the service and the target-group; the encouragement of selfcare or the contribution to the quality of the clinical assistance.^{11,16} In that regard, this study built and validated the content/appearance of the Pregnant Men's Booklet, which was considered adequate by the expert judges with regard to the accomplishment of the proposed goals.

In the selection of judges involved in the validation process, we aimed at health professionals with higher expertise in practice and technique in both the healthcare and prenatal care of trans people, intending to provide

Table 2

Suggestions from judges and modifications adopted. Mossoró (RN), Brazil. 2023.		
Booklet Item	Suggestion	Modification
Cover	Only one image instead of two.	Reformulation of the cover according to the suggestion.
Language	During pregnancy, most men lose characteristics referred to as "masculine", which may lead to discomfort. However, they are still trans men. We should not associate pregnancy to femininity only, which is also true for masculinity. The body changes during pregnancy and these changes should be supported during prenatal care, including the loss of masculine characteristics.	Adoption of a language, as far as possible, distant from gender poles.
Structure of the topic of identification of pregnant men	The name existent in the front of the booklet should be the social name, any rectification available on the background.	Exclusion of the space related to the desire of rectification of civil name and addition of a topic with guidelines of how to make it on their own.
Images	I consider it highly important, being careful to assess the availability of pictures and copyrights in order to avoid problems.	Review of copyrights of all images used in the booklet.
Topic with suggestions of clothes for transgender pregnant men	I believe that clothing should not interfere with the assistance neither is it an obstetrics or gynecological component of prenatal, being a decision of the patient based on his personal style, cultural concepts and how he feels comfortable.	Exclusion of the item due to the lack of scientific evidence.
	I believe that it should be discussed with pregnant trans people the relevance of the guideline for them and whether recommendations should be part of the consultation.	Exclusion of the item due to the lack of scientific evidence.
	Some studies relate tight clothes to Intrauterine Growth Restriction (IUGR), I would not recommend.	Exclusion of the item due to lack of scientific evidence.
General structure of the booklet	I missed the existence of a page with the registry of Monthly consultations with complaints, weight, BP, IA and FHR monitoring.	Inclusion of the session of registry of prenatal consultations present on the 2018 edition of the Pregnant Women's Booklet of the Ministry of Health.

IUGR= Intrauterine Growth Restriction; BP= Blood Pressure; IA= Intermittent Auscultation; FHR= Fetal Heart Rate.

better quality to the content of the technology.¹⁵ In the SUS context, we still identify a limited number of experts among the several categories and areas of activity that have experience and/or qualification in providing care to this group, mainly in the prenatal care.¹⁹

Although the profile of participants has contemplated the minimum number of specialists recommended by the literature and belonged to a single professional category (Medicine), all of them had broad experience in providing healthcare to the target-group, besides qualification and expertise in strategic areas, namely: Family Medicine, Gynecology and Obstetrics, and Endocrinology.

The stage of content addition and adjustment of the educational assistive technology was based on the prototype conceived initially¹⁶ and the Pregnant Women's Booklet.¹⁴ We considered the structuring of its components and main topics, since we recognize the importance of guidelines and recommendations proposed by the instruments. The analysis of validity and reliability demonstrated satisfactory results with the number of

items formulated observing more updated international guidelines regarding the subject, and presented acceptable psychometric values.¹⁸

The exclusion of the item 9 from the checklist occurred by means of the reading of scientific papers that address the impact of different types of clothes during the pregnancy of trans men.^{20,21} We did not find relevant evidence that pointed to a relationship between the use of tight clothes with the Intrauterine Growth Restriction (IUGR). However, this practice may lead to the development of vaginitis and genital rash, as well as varicosities.

We understand that the production of the booklet indicates the empowerment of trans men in the natural phenomenon of human reproduction, which is frequently target of penalties, retaliations and microaggressions.²² The social configuration of pregnancy as something restrict to cisgender women establishes psychological and emotional triggers for pregnant trans men related to the alienation of the pregnant body and the perinatal bodily

changes.⁵ In addition, the temporary interruption of the cross hormone therapy may induce oscillations to the humor of pregnant men.²³

We also mention that resuming hormone therapy with testosterone, after birth, may affect the process of breastfeeding, due to the existence of interference in the production of hormones necessary to lactation, such as prolactin and insulin.²⁴ By virtue of several existing configurations of families, we can consider the possibility of trans men having relationships with trans women. It is important for people to be aware of this option and to discuss it with the multidisciplinary team the possibility of inducing the lactation of trans women partners.⁷

Another aspect addressed regards the type of delivery in pregnant transsexual men that should not be based on a formal indication, but in an individualized analysis, which considers all personal perceptions of pregnant men in relation to their own bodies and their comfort, as well as other clinical aspects.²⁵

Although the booklet was initially conceived for the use of primary care professionals, we evidenced the viability of the technology in several scenarios of healthcare. The mentioned material presents a promising potential of subsidizing the process of continued education of health professionals in necessary adequations to the prenatal care of trans men.¹⁹

As a limitation of the study, we mention the minimum sample of the group of judges participating in the validation being composed of only physicians, without contemplating other health professionals, as well as the target-group of the booklet.

We conclude that the Pregnant Men's Booklet, as the assessed educational assistive technology, constitutes an innovative and feasible tool in the prenatal care of pregnant trans men, since it advances in the prerogative of change of the assistance model, aiming at selfcare and supportive care for this group in health services. Furthermore, we identify a need for resuming the study from the perspective of pregnant people, which uses external validation with pregnant men.

Authors' contribution

Henrique MEC: conceptualization, data analysis and interpretation, writing. Clementino FC: data interpretation and writing. Avelino MML: conceptualization, analysis and review of the final version. Cavalcante ES, Nascimento EGC: data interpretation, writing and review of the final version. Pessoa Júnior JM: conceptualization, data analysis and interpretation, writing and review of the final version. All authors approve the final version of the article and declare no conflicts of interest.

Data Availability

The entire data set supporting the results of this study has been published in the article itself.

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