Video clip on the physiology of lactation for postpartum women: validation of appearance, barriers, and facilitators for use by the target audience

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ABSTRACT

Objectives: validate the appearance of a care-educational technology for learning the physiology of lactation and identify barriers and facilitators to its use by postpartum women. **Methods:** methodological study to validate the appearance of a video clip (https://www.youtube.com/watch?v=dhiUfNXu7AE) by the target audience. Data collection occurred in the rooming-in unit of two public hospitals in southern Brazil, in person and by telephone. The Assistive Technology Assessment Questionnaire, an Appearance Validity Instrument for Educational Technology in Health, and a questionnaire on facilitators and barriers were used. The analysis used simple and percentage frequencies, means, standard deviation (SD), and the Apparent Validity Index (AVI). For facilitators and barriers, the answers were grouped into themes based on similarities in content. **Results:** the video clip was assessed (n = 156 postpartum women) as adequate in terms of interactivity, objectives, clarity, relevance, and efficacy (mean = 1.93; SD = 0.12). The AVI was excellent (AVI = 0.97). The facilitators reported were accessible language, objectivity, and attractiveness; the barriers included too many technical terms and the need to watch the video more than once. **Conclusion:** the video clip has excellent apparent validity and suitability and can be used to teach postpartum women about the physiology of lactation.

Descriptors: Breast Feeding; Nursing; Evaluation Study; Educational Technology; Maternal and Child Health.

INTRODUCTION

Nursing care for maternal and child health is complex and requires professionals to have competencies based on technical, theoretical, and scientific knowledge to meet the clinical and social needs of the mother-baby-family trinomial[1] and to develop health education activities based on scientific evidence[2]. In this context, various digital technologies can be considered innovative and effective[3].

The use of care-educational technology[4] gives meaning to a composite of scientific and everyday knowledge of health professionals, which encompasses the process of caring/educating and educating/caring for oneself and others based on the principles of human praxis. These principles encompass the critical, reflective, creative, transformative, and multidimensional levels of awareness between people and the context. This is an innovative opportunity to design technological products that transcend the fragmentation between educational and care technologies[4].

Care-educational technologies conducive to health education can promote the learning of abstract content that is difficult for users to understand. An example of abstract content for educational nursing actions in maternal and child health care is the physiology of lactation, which involves the interaction of hormones and their in-

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fluence on the onset and maintenance of milk production[5]. In order to promote the learning of this content (educate) and, consequently, support maternal breastfeeding (care), an audiovisual care-educational technology has been developed in the format of a video clip based on scientific evidence and validated by experts[6,7]. Its combination with other technologies has shown positive results in maintaining maternal breastfeeding[8].

However, once the technologies have been developed, they need to be evaluated by the target audience to maximize the use of the knowledge proposed in the intervention[9]. It is essential to check for possible adjustments so that the technology is a tool for translating knowledge[10]. Therefore, it is essential that the target audience of postpartum women, who are the protagonists of breastfeeding, assess whether the care-educational technology translates knowledge of the physiology of lactation.

Thus, the aim of this study was to validate the appearance of a care-educational technology for learning the physiology of lactation and to identify barriers and facilitators to its use by postpartum women.

METHODS

This study is part of the Knowledge Translation in Action Project, a conceptual model formalized in Canada in 2000, which comes from reviewing and aggregating more than 60 theories and action planning models[10]. The content translated was the physiology of human lactation and the tool created in video clip format was considered a care-educational technology[6] called "Lactashow: the lactation cycle" [In Portuguese: "*Lactashow: o ciclo da lactação*"] (https://www.youtube.com/watch?v=dhiUfNXu7AE), which was validated by experts[6,7].

In this section, two phases of the conceptual model's application cycle were carried out: adapting knowledge to the local context and assessing barriers/facilitators to using knowledge. To develop these phases, this research carried out a cross-sectional study in two stages: face-to-face and telephone (Figure 1). The data was collected from February to September 2022.

Based on the assumption that an understanding of the physiology of lactation can promote and support breastfeeding, the researchers chose to collect data from the rooming-in units of two public hospitals in the municipality of Santa Maria, in Rio Grande do Sul (RS), Brazil, which are considered references for the care of gynecological and obstetric complications in the Center-West region of the state, in addition to being teaching fields for schools and universities in the area.

The target population was postpartum women, given that they have experienced both the beginning of the lactation physiology process during pregnancy and breastfeeding in the postpartum period. These conditions are ideal for evaluating the suitability of the video clip and identifying the barriers and facilitators to its use.

To calculate the sample, the approximate number of monthly deliveries at the two institutions was used as a basis, giving a total population of approximately 250 postpartum women. Considering a margin of error of 5% and a 95% confidence interval, a sample of 152 participants was estimated. For the technology to be classified as adequate, it had to be considered good by at least 55% of the sample[11].

The postpartum women inclusion criteria were being rooming-in with a newborn with good vitality before hospital discharge and at least 6 hours postpartum; expressing the decision to breastfeed; age 12 or over (considering the Brazilian Child and Adolescent Statute of 1990, with the authorization and consent of the legal guardian). Postpartum women with any contraindication to breastfeeding, mothers of newborns with cleft palate and/or esophageal atresia, and twin births were excluded.

The discontinuation criteria were women giving up on participating, changing phone numbers, and not answering calls after three attempts on consecutive days and at different times.

For data collection, a team was trained to invite postpartum women to participate in the study, obtain their consent (or agreement, depending on their age), present the video clip, and apply the instruments in person and by telephone.

The team comprised a doctoral student, the author of the study, five volunteers (a master's student in nursing, three undergraduate nursing students, and a medical student), and all members of the research group to which this study is linked.

After the postpartum women were invited to participate in the study, they were given a free and informed consent, providing information on the average time it would take to watch the video clip (2 minutes and 33 seconds) and answer the questionnaires (15 minutes). As the initial approach was at the bedside (face-to-face stage), the women sometimes cared for the newborn with their companions.

At this point, an interview was conducted to collect characterization items (mother's age, marital status, paid work, and family income). The Assistive Technology Assessment Questionnaire (ATAQ, acronym in Portuguese, QATA)[11] and the Instrument for the Appearance Validity of Educational Technologies in Health (IAVETH, acronym in Portuguese, IVATES)[12] were then applied. A study support material (a card) containing a QR code for free access to the video clip, and information on the continuity of data collection was also given to participants.

The QATA contains 12 items, consisting of statements referring to attributes of the technology being assessed. Each item is given a score from 0 to 2, and the answer options are: inadequate (score = 0); partially adequate (score = 1), and adequate (score = 2)[11].

The IVATES has 12 statements and a 5-point Likert scale for the answers (1 = strongly disagree; 2 = disagree; 3 = partially disagree; 4 = agree; 5 = strongly agree)[12].

The instrument for identifying barriers and facilitators comprised seven dichotomous questions, three open-ended questions, and a blank space to record suggestions. This questionnaire was answered by telephone between the 7th and 18th days after childbirth (second stage). This period was determined so that the postpartum women would have time to use the video clip and be able to answer the questions about barriers and facilitators.

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Figure 1 - Application cycle phases of the Knowledge Translation in Action Project, Santa Maria (RS), Brazil, 2022
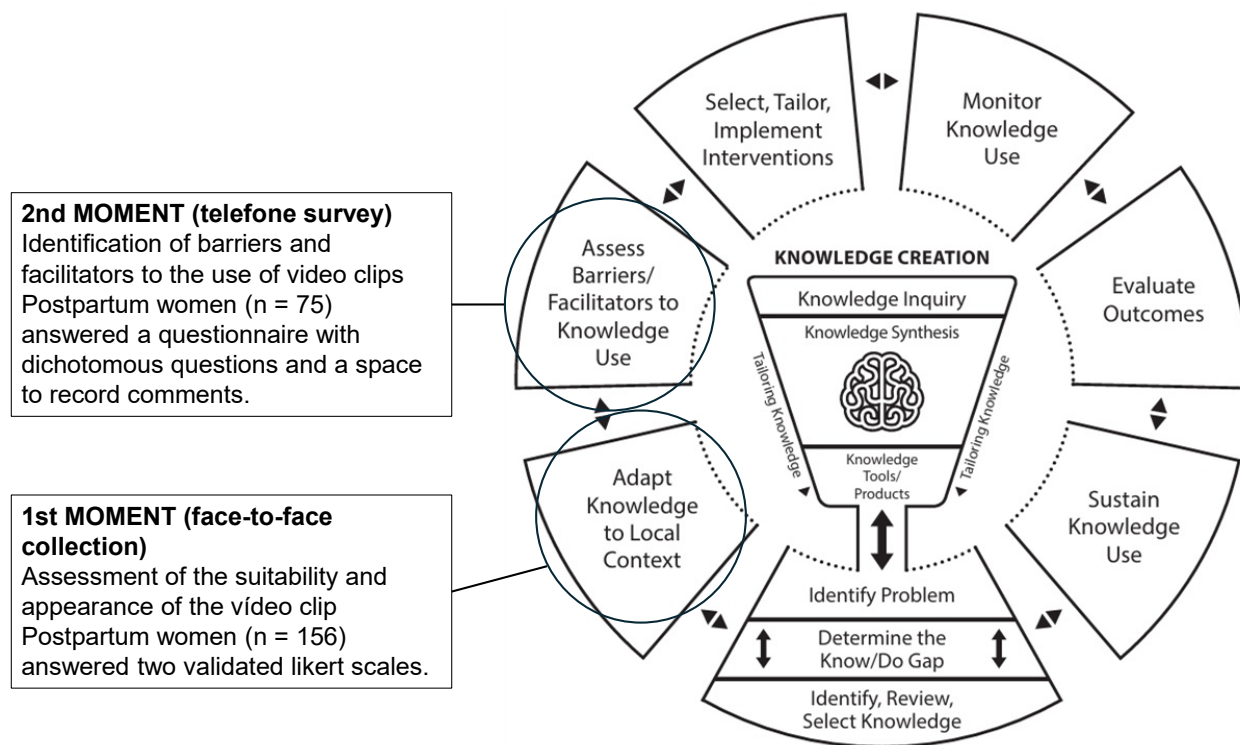
The data was exported to Excel (version 2021, Microsoft Corporation, United States) and then to the Statistical Package for the Social Sciences – SPSS (version 20.0, 2011, International Business Machines Corporation, United States) for statistical analysis. The variables characterizing the participants were analyzed using simple frequency and percentage. The averages obtained for each item and the overall average and standard derivation (SD) were considered to analyze the attributes assessed using the IATA. The technology was considered inadequate when the average of the attributes was 0; partially adequate when the average was between 0.1 and 1; and adequate when the average was between 1.1 and 2.0[13].

The Appearance Validity Index (AVI) was calculated by adding up the AVI for each item (AVI-I) and dividing the result by the total number of items. To calculate the IVA-I, the number of participants who answered 4 or 5 was calculated and divided by the total number of respondents, where ≥ 0.78 was considered excellent; between 0.60 and 0.77 indicated the need for improvements in the appearance of the educational health technology; and an IVA < 0.59 was classified as poor, requiring reworking[12].

Regarding the barriers and facilitators, the aim was to find similarities in the content of the answers and to converge on terms that could aggregate close or similar meanings. Next, the categories and answers to the other questions were analyzed using simple frequency and percentage.

The study was carried out in accordance with the ethical precepts of Resolution Number 466/12 of the National Health Coun-cil[14]. It was approved by the institution's Human Research Ethics Committee, with Certificate of Submission for Ethical Appraisal (CSEA, acronym in Portuguese, CAAE) no. 50516221.8.0000.5346.

RESULTS

A total of 156 postpartum women participated in the first stage. They were aged between 15 and 45, with an average age of 28.87 (SD = 6.7). Over half were single (n = 106; 67.9%) and not working (n = 90; 57.7%). Most of them (n = 84; 53.8%) earned an income of up to one minimum wage (the amount in force in 2022 was equivalent to R$1,100.00).

The average achieved in assessing the video clip's attributes was 1.93 (SD = 0.12), classified as "adequate" according to the established cut-off points. The specific attributes of Interactivity (mean = 1.96, SD = 0.12), Objectives (mean 1.97, SD = 0.12), Relevance and Efficacy (mean 1.86, SD = 0.26), and Clarity (mean 1.94, SD = 0.20) achieved classification scores of "adequate".

The distribution of QATA item scores is shown in Table 1.

Despite achieving a score considered to be adequate, the Relevance and Efficacy attribute obtained a positive assessment regarding the suitability of the resources for their use. However, the items related to changing behavior, interest, and reproduction of the content in different contexts achieved a lower frequency of positive assessments.

As for the validation of the video clip's appearance, the overall AVI was 0.97, which is considered excellent. The AVI-I obtained for the 12 items also achieved a rating of excellence (Table 2).

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Table 1 - Distribution of the scores obtained in the evaluation of the attributes of the lactation physiology video clip by postpartum women, Santa Maria (RS), Brazil, 2022

Attributes	Score		
	1	2	3
	n* (%)	n* (%)	n* (%)
Interactivity			
1. The content is adequate for its needs	0 (0)	6 (3.84)	150 (96.15)
2. Offers interaction and involvement in the educational process.	1 (0.64)	0 (0)	155 (99.35)
3. Allows easy access to the topics presented	1 (0.64)	6 (3.84)	149 (95.51)
4. Provides autonomy to the user in relation to its operation	0 (0)	8 (5.12)	148 (94.87)
Objectives			
5. Stimulates learning about the addressed content	0 (0)	3 (1.92)	153 (98.07)
6. Stimulates learning of new concepts	0 (0)	3 (1.92)	153 (98.07)
7. Allows to search for information with no difficulties	1 (0.64)	5 (3.20)	150 (96.15)
8. It has an attractive presentation strategy	0 (0)	7 (4.48)	149 (95.51)
Relevance and efficacy			
9. Provides adequate and necessary resources for its use	0 (0)	3 (1.92)	153 (98.07)
10. Arouses interest to use it	2 (1.28)	15 (9.61)	139 (89.10)
11. Stimulates behavior change in you	6 (3.84)	31 (19.87)	119 (76.28)
12. Reproduces the addressed content in different contexts	3 (1.92)	14 (8.97)	139 (89.10)
Clarity			
13. Presents information in a simple manner	1 (0.64)	9 (5.76)	146 (93.58)
14. Allows reflection about the presented content	1 (0.64)	5 (3.20)	150 (96.15)

Note: 1: inadequate; 2: partially adequate; 3: adequate.
*Number of participants.

Table 2 - Score given to the video clip's appearance evaluation items by the postpartum women, and the respective Appearance Validity Index obtained, Santa Maria (RS), Brazil, 2022

Items	1		2		3		4		5		AVI-I*
	n	%	n	%	n	%	n	%	n	%	
Illustrations are suitable for the target audience	0	0	1	0.64	2	1.28	5	3.20	148	94.87	0.98
Illustrations are clear and easy to understand	0	0	2	1.28	6	3.84	13	8.33	135	86.53	0.94
Illustrations are relevant for the content understanding by the target audience	0	0	1	0.64	1	0.64	5	3.20	149	95.51	0.98
The colors of illustrations are suitable for the type of material	0	0	0	0	4	2.56	6	3.84	146	93.58	0.97
The shapes of illustrations are suitable for the type of material	0	0	0	0	2	1.28	6	3.84	149	95.51	0.98
Illustrations depict the daily life of the target audience of the intervention	1	0.64	0	0	3	1.92	5	3.20	147	94.23	0.97
The layout of the figures is in harmony with the text	0	0	0	0	2	1.28	6	3.84	149	95.51	0.98
The pictures used to elucidate the educational material	0	0	0	0	1	0.64	3	1.92	152	97.43	0.99
Illustrations help to expose the theme and are in a logical sequence	0	0	0	0	3	1.92	5	3.20	148	94.87	0.98
Illustrations are in appropriate quantity for the educational material	0	0	0	0	5	3.20	2	1.28	149	95.51	0.96
Illustrations are of appropriate size for the educational material	1	0.64	1	0.64	1	0.64	4	2.56	149	95.51	0.98
Illustrations help to change the behavior and attitudes of the target audience	3	1.92	1	0.64	8	5.12	8	5.12	136	97.17	0.92

Note: 1: totally disagree; 2: disagree; 3: partially disagree; 4: agree; 5: totally agree.
*Item Appearance Validity Index.

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In the second stage, 75 postpartum women (48.0%) participated in evaluating the facilitators and barriers to using the video clip. The others discontinued their participation in the survey.

In the opinion of postpartum women, the facilitating factors were accessible language, objectivity (2 minutes and 33 seconds), and attractiveness.

The barriers were the technical terms and the amount of information, which implies the need to repeat the video clip to retain the content better (Figure 2). Six participants (8.0%) reported the need to watch the video clip more than once.

Seventy-one participants in the second stage said they would recommend the video clip to others. They expressed the importance of disseminating the video clip to primiparous, breastfeeding, and postpartum women, those planning to have children, and pregnant women and their families. Another suggestion was to put the video clip on more platforms, stressing the importance of disseminating the product to other audiences.

DISCUSSION

The video clip produced is a care-educational technology suitable for the objectives set and is a potential mediator for translating knowledge to the target audience. The video clip can be used to develop educational actions with postpartum women, since this target audience showed that the content of lactation physiology was translated for use. Thus, the study contributes to maternal and child care as a tool for health literacy, in which professionals can mediate access to the video clip in actions to support breastfeeding, in the rooming-in unit, or even in primary health care consultations.

The results are particularly relevant since they highlight the need for clear, accurate, and culturally congruent information to support breastfeeding effectively[15] and that video-mediated educational intervention offered to primiparous women postpartum can help increase breastfeeding rates[16].

The interactions triggered by educational videos that feature illustrative images and audio, with simple and easy-to-understand language, promote reflection and critical thinking since they enhance knowledge acquisition, thus being efficient as a resource for health education[17].

Using videos for educational purposes has the positive point of being a fast, comprehensive tool that encourages autonomy and development through play. It also allows the user to interact with knowledge and cooperation between the people who share it. Nowadays, with the more common use of educational videos, they

Figure 2 - Barriers and facilitators to the use of lactation physiology video clip as perceived by postpartum women, Santa Maria (RS), Brazil, 2022
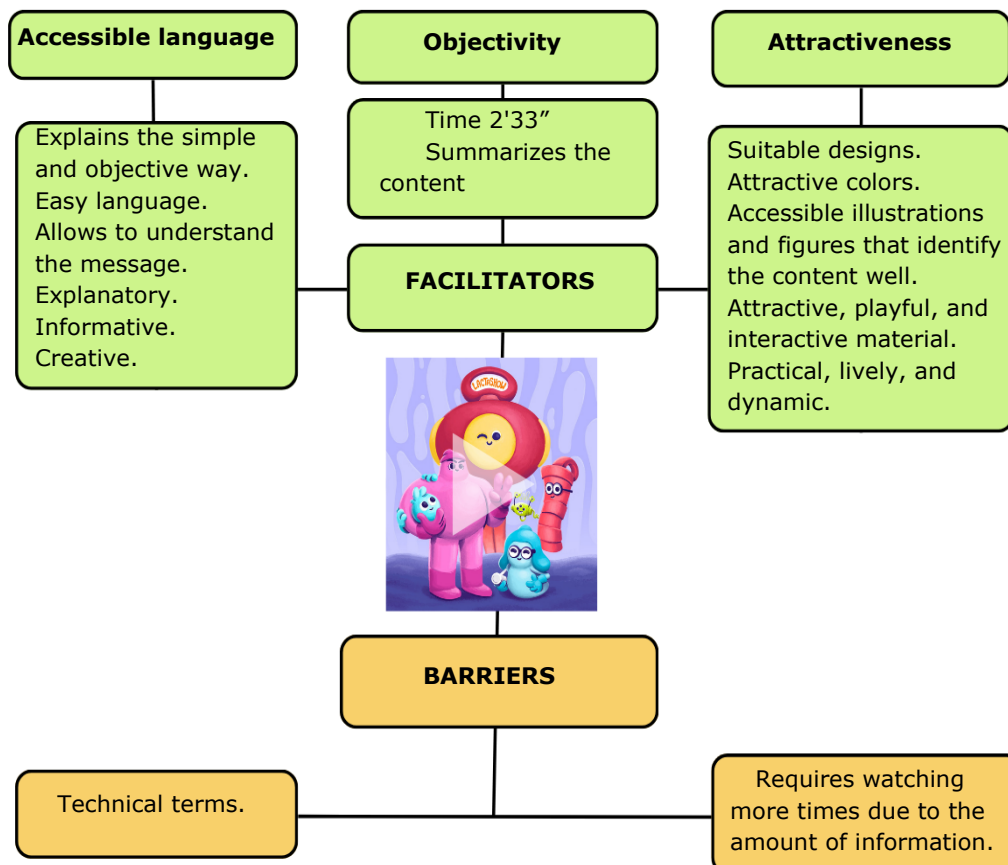
Source: Adapted from Straus, Tetroe, Graham[10]

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may no longer represent a sophistication in learning[18] and become a tool for day-to-day health education, with more engaging and enjoyable content for all ages[19].

It is worth considering the need to maintain the characteristics or attributes of Interactivity with the target audience, Objectives, Relevance and Efficacy, and Clarity. This is particularly important given that only 18.8% of YouTube videos intended to mediate breastfeeding education were assessed as good or excellent. This same percentage was considered a limited source for patients on breastfeeding[20]. This result strengthens the premise of evaluating educational technologies by the target audience to meet the needs expressed in the local context in which they were created[20].

In this study, the Interactivity and Objectives attributes had the highest average scores on the I QATA scale. They are concerned with learning issues in that the video clip offers interaction and engagement in the educational process (Interactivity) and stimulates learning of the content and the new concepts covered (Objectives). The positive evaluation aligns with what this technology proposes, providing support for learning the content of lactation physiology.

In addition, the use of technology that has audio resources with engaging, attractive, accessible, and motivating language promotes the listener's reflection on the subject, as shown in a study in which assistive technology about prostate and breast cancer was evaluated by visually impaired people[21].

The technology evaluated in this study achieved more positive results than technologies developed for other population groups. A study that evaluated an assistive technology for drugs in two Portuguese-speaking countries (Brazil and Portugal) found that, for Brazilian participants, the average for the Objectives attribute was 1.89 and the evaluation obtained by the Portuguese was 1.77[22]. In a study evaluating an app, the tool was considered adequate when it achieved over 63.2% of adequate and partially adequate responses in the same items of the Objectives attribute[23].

The evaluation of technologies by the target audience, with subsequent adaptation when necessary, is fundamental. A review study pointed out that communities' participation in developing early and inclusive interventions is insignificant, and little attention is paid to understanding the experiences of the main actors[24]. Stakeholder and user engagement can improve access to technology designed to support breastfeeding[25].

Educational technologies should explore multiple forms of support for understanding the content, in order to stimulate the curiosity of the target audience[22,23,26].

Since this video clip can be accessed freely and online, the care-educational technology can be viewed as often as needed. In addition, it can be paused, replayed, and/or accelerated, giving it interactivity. Interactive and attractive images can help raise awareness and motivate and educate people about the topic[27].

In relation to the Relevance and Efficacy attribute, although it proved to be adequate, the behavior change item scored lower than the other statements. This may be related to the fact that behavior change is related to multiple factors, only one of which is the learning process[28]. The promotion of breastfeeding is multifactorial, and knowledge on the subject is one of the factors that affect women's decisions and, consequently, the length of breastfeeding[29,30]. One study evaluated the impact of a standardized package of educational videos delivered via bedside television to postpartum mothers on exclusive breastfeeding rates. It found no change in exclusive breastfeeding rates before and after the intervention. However, mothers who watched all four videos were significantly more likely to engage in any breastfeeding (98.9%) compared to those who watched none (80.2%)[31].

Regarding Clarity, the video clip was rated as adequate by the target audience, which is important since clarity has a significant impact on the other criteria evaluated, directly influencing the use of the technology[32], which corroborates the result found regarding the participants' statement that the clarity of the video clip is one of the factors facilitating its use.

The educational material's clarity and objectivity can contribute to building knowledge and adapting to cultural knowledge, as well as promote behavioral changes consistent with the intended objective[33].

Regarding appearance validation, the result compatible with excellence indicates that the target group evaluated the images and their characteristics positively. The use of tools to validate the appearance of educational materials contributes to the optimization and applicability of educational technology to the target audience[12].

Appearance validation, including the evaluation of colors, images, and harmony with the textual information of the educational technology, is an important tool for reducing the knowledge gap between nursing and the target audience[12] and translating the knowledge.

Instruments with adequate apparent validity can guide care planning and the achievement of the intended objective[32].

The use of educational videos with organized scenes, simple illustrations, expressive images, and an adequate number of them, complemented by texts in accessible language, contributes to raising awareness, changing behavior and translating information into accessible language[27,34].

The Knowledge-to-Action model points to the importance of identifying barriers and facilitators in using tools (technologies) in the local context as a strategy to enhance the maintenance of the knowledge proposed by the product[10]. In order to identify barriers and facilitating factors for use by the group of interest, it was possible to see that the video's positive aspects align with the proposal of the Knowledge-to-Action model and reinforce the importance of verifying these issues with the knowledge users.

A scoping review on the contemporary challenges of knowledge translation[35] pointed out the inability of health professionals to search for and apply the best evidence in their clinical practices, and that clear, easy-to-understand communication is essential for knowledge translation. Hence, it is important to invest in the production and validation of care-educational technologies, preceded by the necessary search for available evidence to base the development of the material.

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Some of the facilitating features for using video knowledge are content-related, such as accessible figures and illustrations, as well as attractive colors. Features such as these make the tool entertaining, as it is visibly illustrative and presents the proposed aspects in detail, making it an attractive content tool[36]. Illustrations and key points on the subject can clarify doubts and facilitate educational dialog with nursing mothers.

Furthermore, in this study, the postpartum women indicated that being able to watch the video more than once was a facilitator. In a study conducted in the waiting rooms of six maternal and child health centers, where mothers could choose to watch forty-seven videos, the participants indicated that it was beneficial for learning when the videos were watched repeatedly[37]. When analyzing the manifestations of barriers to the use of video clips, there were issues inherent to the postpartum period as a time that requires numerous demands for care, which sometimes makes it impossible to access and/or seek out the use of technologies. This points to the importance of a structured and qualified support network so that women have the time and initiative to seek out more sources of information about the content and feel safe.

One possible limitation of this study was that the data was collected over the phone, which did not ensure privacy. We recognize the memory bias, which, because this is a period of hormonal and physiological changes, could compromise the accuracy of the information regarding the assessment of a technology that might not have been accessed for a few days.

CONCLUSION

The care-educational technology in the form of a video clip on the physiology of lactation has an excellent apparent validity index and was considered adequate by the postpartum women in terms of the attributes of Interactivity, Objectives, Clarity, and Relevance and Efficacy, thus constituting a tool that can be used in health education to introduce the topic of breastfeeding.

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CCP: conceptualization; data curation; formal analysis; funding acquisition; methodology; project administration; resources; supervision; validation; visualization; writing – original draft and writing – review and editing.

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Conflict of interests

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