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Construction and validation of a clinical simulation scenario on umbilical cord stump care

Construção e validação de cenário de simulação clínica sobre o cuidado com o coto umbilical

Construcción y validación de un escenario de simulación clínica sobre el cuidado del cordón umbilical

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ABSTRACT

Objective: To develop and validate clinical simulation scenario for teaching women in their puerperium and their families about care for the newborn's umbilical cord stump.

Method: Methodological study in two stages: 1 – elaboration of the checklist of the procedure for cleaning the umbilical cord and of the clinical case; and 2 – development of the simulated scenario. A Content Validity Index of 0.8 was adopted as the valid range of agreement.

Results: After validation, the case was validated, being approved by 100% of the experts. All items of the simulation scenario obtained agreement scores above 0.91.

Conclusion: The validated scenario can be used in different contexts: teaching of Neonate Nursing, training teams, and teaching women in their puerperium and their families, who were the target of the study. Considering the benefits of simulation, we believe the simulation here will contribute to better and safer care.

Keywords: Neonatal nursing. Health education. Simulation technique. Patient discharge. Infant, newborn. Umbilical cord.

RESUMO

Objetivo: Desenvolver e validar cenário de simulação clínica para ensino de puérperas e familiares sobre cuidados com o coto umbilical do recém-nascido.

Método: Estudo metodológico em duas fases: 1 – construção de *checklist* do procedimento de higienização do coto umbilical, elaboração e validação semântica do caso clínico com 11 experts em simulação e área materno-infantil; 2 – desenvolvimento e validação do cenário junto a 11 experts em simulação e em neonatologia/pediatria. O Índice de Validade de Conteúdo de 0,8 foi adotado como relevante alcance de concordância.

Resultados: Após construção do caso, realizou-se validação, aprovada por 100% dos *experts*. Todos itens do cenário simulado obtiveram escores de concordância superiores a 0,91.

Conclusão: O cenário validado pode ser utilizado em diferentes contextos: ensino da Enfermagem Neonatal, capacitação de equipes e, aprendizagem de puérperas e familiares, alvos do estudo. Vistos benefícios da simulação, acredita-se na sua contribuição para melhoria assistencial e cuidado seguro.

Palavras-chave: Enfermagem neonatal. Educação em saúde. Simulação. Alta do paciente. Recém-nascido. Cordão umbilical.

RESUMEN

Objetivo: Desarrollar y validar un escenario de simulación clínica para enseñar a las puérperas y sus familias sobre cuidado con el cordón umbilical del recién nacido.

Método: Estudio metodológico en dos fases: 1 – construcción de un *checklist* para el procedimiento de limpieza del muñón del cordón umbilical y elaboración del caso; 2 – desarrollo del escenario simulado. Se adoptó un Índice de Validez de Contenido del 0,8 o mayor como relevante para concordancia.

Resultados: Luego de la construcción del caso, la validación fue aprobada por el 100% de los expertos. Todos los ítems del escenario de simulación obtuvieron puntajes de concordancia superiores a 0.91.

Conclusión: El escenario validado puede ser utilizado en diferentes contextos: enseñanza de Enfermería Neonatal, entrenamiento de equipos, o aprendizaje de las puérperas y sus familias, que fue el objetivo del estudio. Considerando los beneficios de la simulación, creemos en su contribución para una atención mejor y más segura.

Palabras clave: Enfermería neonatal. Educación em salud. Simulación. Alta del paciente. Recién nacido. Cordón umbilical.

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INTRODUCTION

After a birth, the umbilical cord is clamped and sectioned. Then, it starts to be referred to as umbilical cord stump. The process of mummification takes place from three to four days after birth, and the stump becomes detached from four to eight days on average, to a maximum of fifteen days. This is considered to be the physiological detachment process[1].

During the mummification process, hygiene care with the umbilical stump are essential to prevent omphalitis (bacterial infection of the umbilical stump), which has an incidence of 0.7% in developed countries and 2.7% in developing ones[2].

To prevent the infection, the Ministry of Health (MS) recommends cleaning the site with 70% alcohol or an alcoholic chlorhexidine solution at 0.5% after bathing and exchanging diapers[1]. The World Health Organization (OMS), on the other hand, recommends dry care (keeping the stump dry without the use of any products) for developed countries and hospital deliveries. Nonetheless, they recommend the use of antiseptics in home deliveries and in developing countries with high neonate death rates and situations with inadequate hygiene[3]. Therefore, in the Brazilian territory, using antiseptics to clean the stump is a recommended by both MS and WHO.

In addition to these divergences in regard to preventing omphalitis, some umbilical stump care practices applied after the newborn is born are controversial. This is especially true for some practices applied at home, which, often, compromise safe care. These include the fear of parents to manipulate the stump; difficulties providing this care; the use of home-products with no proved scientific efficiency; the use of bandages, which stifles the scarring and can be a mean for the culture of bacteria; and the performance of superstition-based charms[4]. Due to the relevance of the topic and the fears and doubts of parents, which may compromise the care to the neonate, the different actors related to the care of the newborn must be care must be well-prepared: academics, workers, women in postpartum period and relatives/caregivers of the newborn.

Among teaching strategies, the use of clinical simulations stands out. Studies have shown that simulation practices promote cognitive and behavioral education and can provide significant learning for the participants, with results better than those of traditional teaching[5,6]. This is an important strategy to increase the clinical experience of students and health teams, leading to improvement in health and ensuring the safety of the patient, while maximizing learning and limiting the frequency and impact of potential adverse effects of the assistance[7–9]. Although the good results of simulation in the teaching process of caregivers are well-established, this is a recent and seldom-explored topic. Nonetheless, it has great potential as a resource for health education[10], aiming to promote safe care.

Health education aims to improve one's ability to understand, evaluate, and use information acquired, thus making safer decisions. To this end, it is a tool capable of empowering caregivers[11]. To this end, it requires the use of resources that guarantee that the target audience will understand its content. Health education practices can be transmitted using oral explanations with demonstrations and practices, which can be complemented using educational, printed or digital materials[12]. In a qualitative study carried out with parents about the care for neonates, the parents emphasized that practice and other learning resources are beneficial for them to memorize the knowledge acquired, albeit not to the detriment of professional guidance. The practices were seen by the parents as a complement to facilitate understanding how to provide care[13].

Since studies on the cleaning of the umbilical stump are scarce in literature, parents have insecurities regarding this type of care, and there are myths and beliefs that can compromise the safety of the newborn, researches on this topic have become necessary. Simulation, as a teaching strategy that makes significant learning possible, can be used to fulfill this need.

Therefore, the objective of this study was to develop and validate a clinical simulation scenario to teach women in postpartum period and their relatives about how to care for the umbilical stump of the newborn.

METHOD

This is a methodological study carried out in two stages. In Stage 1, a checklist was elaborated for the sanitization of the umbilical stump, and the clinical case was elaborated according with the consensuses and guidelines found in literature. In Stage 2, the scenario for the simulated practice was developed based on literature and on standard operational procedures; the scenario was validated by experts in the fields of Neonatology and Pediatrics.

For the semantic validation of the clinical case and the validation of the simulated scenario, due to the worldwide context of the COVID-19 pandemic, isolation measures recommended by health organs were respected and the research as a whole was developed remotely, using Information and Communication Technologies (ICTs). The study was approved by the Research Ethics Committee under opinion 4.070.774 on June 04, 2020 (31662320.7.0000.8667), and followed all ethical precepts required by Resolution n. 466/2012.

Stage 1

In Stage 1, the study used the theoretical framework by Polit & Beck[14] for methodological studies, based on the search for data from pre-existing knowledge, so the checklist of the procedure could be elaborated[14].

In this stage, the checklist about the technique to sanitize the umbilical stump was created, the scenario of the simulated practice was elaborated. A simulated but realistic stump was created in such a way that it was the closest in consistency and mobility to real ones, that could be sanitized with an antiseptic solution without damage, so it could be attached to a newborn dummy.

It should be noted that the checklist was created by a search in literature consensuses, guidelines, and standard operational procedures about the sanitization of the umbilical stump. Tests using the simulator started in May 13, and the final version was tested on September 30, 2020, in the fifth test of the simulator (Figure 1), which was created to this end.

In this stage, the clinical case used was elaborated according with the proposals from the instructional script by Galdeano *et al.*.[15], which were: Stage 1 – Guiding questions to direct the case study (Who is involved? Which place is being studied? What happened? What is the problem? How did it happen? Why did it happen? Which are the alternatives to solve or mitigate these issues? or Which solutions or alternatives are being proposed?); Stage 2 – identification of the location or person being studied; Stage 3 – summary of the issues identified; Stage 4 – establishment of a theoretical framework; Stage 5 – alternatives or proposals; Stage 6 – actions implemented/recommended; and Stage 7 – discussion about the case study.

The topic "umbilical cord stump sanitization" was chosen considering the relevance of providing health education to the woman in postpartum period and their relatives, to ensure that the neonate will receive safe home care at home, which led to the problematization of a real situation in a simulated lab environment.

After the clinical case was constructed, its semantic validation took place.

The semantic validation of the case was carried out via collaboration with researchers from the area of interest of this study, who had experience with simulated practices and worked in the maternal/childhood field. The expert sample was selected by convenience, with participants invited after a curriculum analysis at the platform Currículo Lattes. Experts were selected according with an adapted version of Fehring's (1987) criteria[16], which are: post-doctorate studies (five points); PhD (four points); MS (three points); publication in a recognized journal on the field of interest of the study (two points); specialization in the fields of interest of the study – pediatrics; neonatology; obstetrics; simulation (two points); at least two years in direct assistance in the fields of interest of the study (two points); and participant in scientific events in the last two years about the topics of interest of the study (one point). To be selected, the expert should reach a minimum of five points and have, at least, an MS. All criteria were verified in the curriculum analysis. It stands out that, the highest the score of the experts, the stronger the evidence.

Figure 1 – Final version of the high-fidelity umbilical cord stump simulator, attached to a low-fidelity neonate manikin. Uberaba, Minas Gerais, Brazil, 2021

Source: Researcher personal collection (2021).

In this stage, 17 professors who work in the maternal/childhood field in federal and state universities were invited to participate as experts. Although researchers from all regions of the country were invited, all those who responded were from the southeast of the country. Five of them worked in the state of São Paulo, four in Minas Gerais, and two in Rio de Janeiro. The sample was selected by convenience after a curriculum analysis at the platform Currículo Lattes. 11 of the experts invited participated. After they accepted participation, they were sent a Google Form®. The file was made available at Google Drive® with the full description of the setting with a Likert scale for semantic validation formed by the items: language, content, objective, applicability, and cultural acceptability. The evaluator could select the following options for each alternative: strongly disagree; disagree; agree; strongly agree. They could also not answer the option. For each item evaluated, they had the option of filling a field with comments and/or suggestions. Two rounds of evaluation were needed until a consensus between evaluators was reached. This stage of the research took place from July to Augusto 2020.

The data collected using the Google Form® were imported into a Microsoft Excel® spreadsheet which, in turn, was later imported into the application Statistical Package for the Social Sciences®, version 23.0. Semantic validation data were presented in absolute and relative frequencies. The Content Validity Index (CVI) was also calculated to evaluate the extension of the agreement between specialists. The answers "strongly agree" and "agree" were considered to mean an agreement, and the answers "strongly disagree" and "disagree" were considered to mean a disagreement. The formula used to calculate CVI was CVI = agreement/total of judges. A minimum coefficient of 0.80 was adopted as a relevance index in the agreement of the evaluators[14].

Stage 2

After the clinical case was developed and went through semantic validation (Stage 1), the development and validation of the simulated scenario itself were executed in stage 2.

To develop the simulated scenario, the theoretical framework by Jeffries[17] was adopted. It is formed by the following items: topic identification; simulation objectives; participants; scenario, briefing and debriefing. It stands out that the construction of the scenario used this framework and also followed recommendations from the elaboration guidance standardized by the International Nursing Association for Clinical Simulation in Learning (INACSL)[18].

The simulated scenario, rooming-in care nursing ward, was developed in the simulation laboratory of a public higher education federal institution. A unique feature of this simulation is the fact that the scenario at hand can be carried out by professors, direct assistance workers, or facilitators from both fields of Obstetrics and Neonatology, which are intrinsically related in the process of assistance.

In this stage, we invited evaluators who were involved in direct assistance to neonates and women in postpartum period. They were invited by convenience, as they were from the same institution as the researchers who already knew the clinical simulation. The sample of evaluators of the scenario was formed by the alumni of a specialization course in Neonatology from a federal university from Minas Gerais. A researcher invited them to participate in the validation of the simulated scenario via e-mail. The body of the message included the link for the electronic form. The form was elaborated at Google Forms® and divided in sections. The first section included the title and the presentation of the simulated scenario. The second section presented the Free and Informed Consent Form elaborated according with the "Guidance for procedures with a stage on a virtual environment", from the National Commission of Research Ethics (CONEP), published in February 25, 2021. After reading the term, the participant could select one of two answers. If they selected answer 1, "Yes, I accept participating in the validation", they would be automatically brought to section 3. If they chose alternative 2, "I do not accept participating in the validation", they received a message thanking them for the response and the research was finished. No evaluator refused participating.

Section 3 asked participants to insert their personal data. Section 4 requested their academic data, to characterize the sample. On section 5, the evaluators had access to the validation checklist, to the script of the simulated scenario, and to a recorded video of the simulated scenario. All archives were made available on Google Drive®, with a link that provided access to all evaluators.

Due to the pandemic sanitary restrictions, we decided to record the scenario in a simulation lab. Women in postpartum period and their relatives (final users) were not included in this stage to ensure their safety, being replaced by actors and a simulated baby for the simulated activity.

The video of the simulated setting lasted for 16m 7s and presented the stages of briefing, which lasted for 7m 17s; scenario in action, 3m30s; and debriefing, 6m20s. There were subtitles throughout the scenario to facilitate understanding. Images were recorded by the specialized sector of the university with which the authors are affiliated.

In Section 6, the stages addressed by the briefing were evaluated; in Section 7, the scenario in action; and in Section 8, the debriefing. After each stage, there was a field

where comments and suggestions could be made. In Section 9, a field for general comments and suggestions was made available.

Evaluators used an instrument developed for this study that included the items to be evaluated in the briefing, simulation, and debriefing. The instrument was organized in sections and included the options for evaluation the participants had: "performed" or "not performed", in addition to a field for suggestions. Recommendations were given for the evaluators to the effect that, after visualization of the video, they should fill in the data collection instrument.

Similarly, data were collected using the Google Form® were imported into a Microsoft Excel® spreadsheet which, in turn, was later imported into the application Statistical Package for the Social Sciences®, version 23.0. The CVI was used to evaluate the agreement among evaluators, as previously mentioned. The minimum coefficient of 0.8 agreement between evaluators was also adopted in this stage[14].

RESULTS

The researchers used the stages by Galdeano *et al.* (2003) [15] to elaborate the clinical case, considering evidence-based practices. Considering the guiding questions as a direction to create the case, we elaborated the story of a dyad (mother in postpartum period and newborn) receiving attention in a rooming-in care ward in a teaching hospital more than 12 hours after birth. In the scenario, the mother has just sanitized the perineum of the neonate and will now sanitize the umbilical cord stump. The main objective of the case is for mothers to sanitize the stump of the newborn safely, using correct techniques and principles. The case was a situation in which the woman should sanitize the newborn's stump according with their knowledge.

In the construction of the clinical case, the following was elaborated:

> *Ms. XXXX* (name of the mother), *we would like to invite you to participate in a simulation about how to sanitize the umbilical cord stump.*
>
> *Even if you have already received guidance about this care, we aim to reiterate what you have learned, and you will be able to clarify any doubts and discuss this topic after the scenario we will show.*
>
> After being asked about her health condition:
>
> *You* [...] *had your baby more than 12 hours ago, you are in good health conditions, walked around the room with no signs of dizziness or discomfort, and received guidance about how to bathe the babe, exchange diapers, and care for the baby's umbilical stump. You have had your lunch and rested after lunch. The baby's diaper is open, due to the fact that you just cleaned the perineum of the baby, who now needs their umbilical stump sanitized.*

The problem situation was developed so the mother could carry out the sanitization technique on the umbilical stump of the neonate. The best evidence on the topic was identified to provide a theoretical base. The framework for its construction were national [1] and international[3] guidelines about care, in addition to standard references and operational procedures that served as a base for the structuring of the checklist for the observation of the technique.

The actions expected included the competence and ability of the mother to identify phlogistic signs in the umbilical stump and warn about them, if present; to sanitize the stump with adequate technique and correct principles; to adequately discard materials and keep the newborn comfortable after the procedure. After the clinical case was constructed, the case was validated.

17 professors who work in the maternal/childhood field in federal and state universities were invited to participate as evaluators. 11 (64.7%) accepted participation. One professor refused participant as he was on vacation; one would retire during the period of the research; and three could not be contacted, as the e-mail sent to them bounced back.

90.9% of the judges were female, with a mean age of 47.8 years old ± 9.3; 81.8%, had PhDs, and 18.2% had concluded post-doctorate studies. Regarding the field of the experts, 27.3% were nurses; 36.4%, nurse experts in Obstetrics; 18.2% were physicians experts in Neonatology; and 18.2% were nurse experts in Pediatric Nursing. The participants had been graduated for a mean of 24.9 ± 9.3 years with a minimum of 10 years and a maximum of 38. On average, they had been working as professors for a mean of 15.2 ± 10.6 years, from a minimum of 2 years to a maximum of 36.

The mean score according with the classification criteria[14] was of 14.5±1.86, with a minimum of 12 and a maximum of 19, meaning that all participants reached the minimum score to act as a evaluators. Table 1 describes the results of the semantic validation of the clinical case about the sanitization of the umbilical stump.

After the first round of validations, all expert suggestions were followed and a modified version was sent back to them, which was approved by 100% of experts. Expert suggestions were mostly aimed at using a language that was more popular and accessible for the target audience of the simulated practice (mothers in postpartum period and relatives).

Table 1 – Semantic validation of the clinical case about the sanitization of the umbilical stump. Uberaba, Minas Gerais, Brazil, 2021

Criteria		Strongly disagree	Disagree	Agree	Strongly agree	Null	CVI
Language	1. The text has a logical sequence	0	0	1 (9.1%)	10 (90.1%)	0	1
	2. The writing style is compatible with the target audience	0	0	1 (9.1%)	10 (90.1%)	0	1
	3. The text is clear and understandable	0	0	1 (9.1%)	10 (90.1%)	0	1
Content	1. The content of the case presents relevant information about the sanitization of the umbilical stump	0	0	1 (9.1%)	10 (90.1%)	0	1
	2. The content is related with the theory (bibliographical survey)	0	0	1 (9.1)	10 (90.1%)	0	1
	3. The presentation of the content favors learning in practice	0	0	1 (9.1%)	10 (90.1%)	0	1
	4. The content of the clinical case is adequate for the target audience	0	0	1 (9.1%)	10 (90.1%)	0	1
	5. The clinical situation is similar to the one found in reality	0	0	0	11 (100%)	0	1
Objective	1. The clinical case can be used for health formation/education	0	0	0	11 (100%)	0	1
	2. The objective of the case is clear	0	0	1 (9.1%)	10 (90.9%)	0	1
	3. The objective of the case is relevant for the practice	0	0	0	11 (100%)	0	1
Applicability	1. The use of the case presents more benefits than limitations	0	0	0	11 (100%)	0	1
	2. The clinical case favors learning about umbilical stump sanitization	0	0	0	11 (100%)	0	1
Cultural acceptability	1. The text is compatible with the target-audience and attends to different profiles	0	0	1 (9.1%)	10 (90.9%)	0	1
	2. Would you change something in the text? – 1st round	Yes – 3 (27.2%)	No – 8 (72.7%)				
	3. Would you include something in the text after the 2nd round?		No – 11 (100%)				

Source: elaborated by the authors (2021).
Note: Research data (2020).

In Stage 2, after the semantic validation of the clinical case, the validation of the simulated setting was carried out according with Jeffries[17] theoretical framework. The simulated scenario, after validation, was called "Umbilical stump sanitization". Its objectives were: sanitizing the umbilical stump safely, using correct technique and principles.

The simulates scenario was recorded in a simulated rooming-in care nursing ward, in the simulation laboratory of a higher-education public federal institution. The scenario was formed by a hospital bed; a simple acrylic crib with mattress; a plastic recipient with the materials to be used for the technique; a bedside table; a garbage can to discard the materials (common residues); and two chairs for the team. To carry out the scene, the following materials were used: a pack of sterile gauze; six swabs; a bottle of 70% liquid alcohol; and a booklet with educational information on the topic. On the crib, there was a newborn manikin (medium fidelity) with an attached simulation stump (high fidelity).

The scene focused on the umbilical stump sanitization by the mother. During the briefing of the recorded simulation, the mother, who were interpreted by an actress dressed for the role, received information earlier about the setting of the scenario, handled the equipment and materials, and received guidance about the general objective of the simulation, in addition to performing the actions with the facilitator, who attempted to provide a welcoming environment during the briefing dialog. At this time, the facilitator provided support to the participant in the form of clarifications so the objectives could be reached. He presented the environment as a safe place for learning and the current knowledge about the topic, preparing the simulation before the actual event.

To develop the simulated setting, the checklist of necessary actions expected is presented on Chart 1, which includes the possible answers from evaluators, considering, in addition to whether or not an action was performed, whether it was adequately performed by the actress.

After the briefing, the scene, and the end of the technique, the scenario was considered finished, and the debriefing started. The debriefing was divided in three stages: emotional, analytical, and reflective[19]. This valuable moment of the simulation included a reflection about the simulation as a whole, with the participant describing emotions, perceptions, and experience.

During the stage of scenario validation, 11 evaluators participated (100% of those invited). There were no refusals. One professor was an expert on the topic of the research while ten nurses were specialists Neonatology working in direct assistance with neonate, recent mothers, and their relative. They had previous experience with simulations. All participants were female, with a mean age of 32.3 ± 6.3 years (minimum of 27 and maximum of 63 years old) they had been working in direct assistance for a mean of 8.7± 11.2 years, with a minimum of 3 and a maximum of 41. All evaluators were specialized in Neonatology, two were going through MS studies, two were MSs, one was carrying out PhD studies, and another was a PhD.

The mean score of the participants according with the adapted classification criteria [14] was 8.73±2.18, with a minimum score of 7 and a maximum of 14. Therefore, they all reached the necessary score to act as judges. Table 2 shows the results of the checklist to validate the simulation scenario.

All items from the three stages (briefing, scenario in action, and debriefing) had agreement scores above 0.91 and were considered valid.

Regarding the briefing, the evaluators added four comments. The first suggested to inform the participant of how long the simulated activity lasted. The second suggestion recommended verifying whether the items addressed in the scenario are in accordance with the standard operational procedures of the institution where the simulation will be carried out, while also reiterating the need to ask the patient about their physical conditions and rest situation. In the third comment, the evaluator gave suggestions regarding the practical application of the simulated activity, recommending that all stages should be more detailed, including presentation, reading of the Free and Informed Consent Form, clarifications, checking if someone accompanying the mother wanted to participate in the setting too, and giving information about how the debriefing would take place. In the fourth comment, an evaluator suggested that more elements from popular communication should be used in the activity, bringing the participants closer together. This evaluator also suggested replacing the term "stump" by "navel" and the term "manikin" by "doll", emphasizing that the mother will clean as if this was her child.

Regarding the scenario in action, there were seven comments. In the first comment, the evaluator suggested delivering educational materials to the mother who participates before the scene. In the second, an evaluator suggests that the concept of cleaning from cleaning to dirtier should be added, and that it should be reiterated that the mother should use liquid alcohol, and not gel alcohol. The third comment suggests discarding the first jet of alcohol in the garbage can. The fourth suggested reiterating the practice of not touching the alcohol can on the tip of the swab. The fifth requested that the image should be filmed closer to improve the image of the video. The other two comments stated that all items were present in the scene. During the debriefing stage, there were no comments.

Checklist – simulated scenario: umbilical stump sanitization				
	Performed		Not performed	Notes
	Adequate	Inadequate		
1. Describes the technique to be carried out, including the necessary materials;				
2. Reports doubts and anxieties regarding technique;				
3. Hand sanitization;				
4. Gathering of the materials, which are: bottle of 70% alcohol, swabs, and gauze;				
5. Evaluation of the umbilical stump insertion site and of the periumbilical region;				
6. Removal of a swab from its package without touching the cotton tip;				
7. Dampening the cotton tip of the swab with 70% alcohol;				
8. Using the non-dominant hand to keep the stump away from the abdomen of the child, holding the clamp delicately to handle it;				
9. Placing gauze between the stump and the abdomen;				
10. Using one of the extremities of the swab to clean the basis of the stump with a single circular motion, turning the swab between the index and the thumb;				
11. Using the other extremity of the swab to clean the rest of the stump from the base to the extremity, with single movements, turning the swab after each movement.				
12. Dampening the extremities of another swab, with the use of one of them to clean the clamp with straight movements, turning the swab after each movement;				
13. Using the other extremity of the swab to clean the distal extremity of the stump with single movements, turning the swab after each movement;				
14. Placing the stump upwards and closing the diaper;				
15. Discarding the materials used in an adequate place;				
16. Cleaning the hands.				

Source: elaborated by the authors (2021).

Chart 1 – Checklist of actions expected from the participants at the scene of the simulated scenario of umbilical stump sanitization. Uberaba, Minas Gerais, Brazil, 2021

Table 2 – Results of the checklist to validate the simulation scenario. Uberaba, Minas Gerais, Brazil, 2021

Stages	Items for each stage of the validation of the clinical simulation scenario	Carried out by the facilitator		CVI
		Yes	No	
Briefing	The facilitator presents themselves to the mother	11 (100%)		1
	The facilitator explains the objectives of the simulated setting	11 (100%)		1
	The facilitator establishes a confidentiality agreement	11 (100%)		1
	The facilitator evaluates the physical conditions of the mother	10 (90.9%)	1 (9.1%)	0.91
	The facilitator invites the mother to participate	10 (90.9%)	1 (9.1%)	0.91
	The facilitator presents the scenario	11 (100%)		1
	The facilitator guides the mother regarding the debriefing	10 (90.9%)	1 (9.1%)	0.91
	The facilitator thanks the mother for her participation	11 (100%)		1
	The facilitator describes the clinical case	11 (100%)		1
Scenario in action	The mother cleans her hands before sanitizing the stump	11 (100%)		1
	The mother says what materials she will use for sanitization	11 (100%)		1
	The mother evaluates the place where the umbilical stump is located and the periumbilical region	10 (90.9%)	1 (9.1%)	0.91
	The mother removes of a swab from its package without touching the cotton tip	11 (100%)		1
	The mother dampes the cotton tip of the swab with 70% alcohol	10 (90.9%)	1 (9.1%)	0.91
	The mother uses her non-dominant hand to keep the stump away from the abdomen of the child, holding the clamp delicately to handle it	10 (90.9%)	1 (9.1%)	0.91
	The mother places gauze between the stump and the abdomen	11 (100%)		1
	The mother uses one of the extremities of the swab to clean the basis of the stump with a single circular motion, turning the swab between the index and the thumb	11 (100%)		1
	The mother uses the other extremity of the swab to clean the rest of the stump from the base to the extremity, with single movements, turning the swab after each movement	11 (100%)		1
	The mother dampens the extremities of another swab, with the use of one of them to clean the clamp with straight movements, turning the swab after each movement	11 (100%)		1
	The mother uses the other extremity of the swab to clean the distal extremity of the stump with single movements, turning the swab after each movement	11 (100%)		1
	After sanitization, the mother places the stump upwards and closes the diaper below the clamp	11 (100%)		1
	While the mother carries out the procedures, she states what she is doing safely	11 (100%)		1

Table 2 – Cont.

Stages	Items for each stage of the validation of the clinical simulation scenario	Carried out by the facilitator		CVI
		Yes	No	
Debriefing	The facilitator invites the mother who participated in the simulation experience to reflect on how she felt as she carried out the simulation (emotional)	11 (100%)		1
	The facilitator invites the mother who participated in the simulation experience to describe the scenario experienced (descriptive)	11 (100%)		1
	The facilitator invites the mother who participated in the simulation experience to evaluate the positive points of participating in it (evaluative)	11 (100%)		1
	The facilitator invites the mother who participated in the simulation experience to report what could be improved (evaluative)	11 (100%)		1
	The facilitator invites the mother who participated in the simulation experience to evaluate whether this was a significant learning process (conclusive)	11 (100%)		1

Source: Elaborated by the authors (2021).
Note: Research data (2020).

Concerning general comments an evaluator suggested that, in the debriefing stage, in the part where it is asked about what could be improved, it should be specified that this question is about the technique and not the materials environment, or other items that could influence the practice.

As a result, no negative concepts were attributed, only suggestions to add elements to some items of the validation instrument about the simulation scenario. We believe that all stages were carried out and reached their goals in the simulated activity, guaranteeing the validation of the simulation setting to apply on the teaching of the mothers in postpartum period.

DISCUSSION

According with data from the Informatics Department of the Single Health System (DATASUS), in Brazil, from 2015 to 2019 there have been 135 neonate deaths by omphalitis, with a mean of 27 deaths/year[20]. These indexes are similar to data reported in Angola, where 182 hospitalizations were identified in 18 months involving 26 neonates who died of omphalitis[21]. The authors reflected on how much mothers, their relatives, and neonates are vulnerable regarding care for the umbilical stump, which suggested the need for health education for this public. With these indexes, they classified the situation as a public health concern[20].

The scenario constructed went through the processes of semantic validation of the clinical case and scenario validation and was considered to be valid and adequate in both stages. During the semantic validation of the case, after writing adequations, the CVI was 1.00, while, on the scenario validation, it was 0.91. The process of validation in stages was carried out in a similar way in scenarios reflecting the communication and handling of breastfeeding in Primary Care, and the handling of postpartum hemorrhages, which had CVIs above 0.80 in both stages, thus being considered adequate to reach their goals as educational tools[22,23].

It was found that, even considering high CVI levels in the validation stage, judges contributed to improve the writing of the settings, such as in the case of a setting for the nurse to manage sepsis[24] and postpartum hemorrhage[23]. The scenario presented here had similarities to those one, since only certain aspects of the writing were changed, and the suggestions of the judges aimed to make the scenario easier to understand.

Despite the lack of suggestions about the debriefing, one judge emphasized the need to clarify, when asking about what points can be improve, that this question is regarding the technique, not the materials, environment, or any other item that could influence practice and is not inherent to the person carrying out the cleaning. It is essential for all aspects to be considered during the debriefing, since a study

pointed out that 85% of scholars who went through this experience consider it to be the most important moment of the simulation[25]. Furthermore, a study about debriefings compared the impact of seeing the scene again with sound and images (recorded) at the time of discussion. In said study, the debriefing was considered to be extremely relevant. However, the groups showed no statistical significance, with the way the facilitator conducted the group being the difference between the cases[26].

It must be noted that, in general, studies that use simulation are targeted at teaching and training scholars and professionals, and there are few descriptions in literature of settings to train caregivers and patients, as is the case of this study.

A study involving the training of 87 caregivers of children with tracheostomies about to be discharged had positive results, and debriefing was considered to be the most relevant moment. After the simulation training was introduce, the number of further hospitalizations one week after discharge was reduced and caregivers showed increased confidence when caring for their children who was dependent on oxygen[27].

A similar study, carried out with 29 parents of children with tracheostomies had them go through four different settings with increasing difficulty before the child was discharged. Its results indicated that 80% of these parents found the training to be positive, 97% would recommended for other parents of children with this device before their discharge, and there were higher scores regarding preparation, confidence, and knowledge about care and management of tracheostomy-related emergencies, showing that this is an adequate health education strategy[28].

Simulated scenarios, with growing difficulties and reliability, were developed with caregivers of children with special health needs in preparation for hospital discharge. Caregivers, at first, presented feelings of fear and anxiety, but, after training, felt relieved, self-confident, and satisfied with their performance, highlighting the importance of the support of the facilitator. It was also highlighted that they felt safer to provide care and capable of dealing with the potential challenges of home care[10].

The studies described reiterate the importance and the positive aspects of simulation in the training of caregivers. It also stands out that, in the study carried out here, a high-fidelity model of the umbilical stump was developed to this end. A similar study had been carried out using a low-cost high-fidelity model to train and apply insulin in patients and caregivers. The simulator helped identifying critical aspects of the technique and intervene efficiently and directly. The authors also mentioned that the Brazilian Society of Diabetes recommends that, before the patient is discharged with a diagnosis of insulin-dependent diabetes, the adequate technique for applying insulin should be demonstrated to both patient and caregiver. Then, patient and caregiver must show the technique for the professional who trained them. Using simulation, the recommendations for the care with discharge guarantee that the patient will be safer[29]. Considering the impact of simulation scenarios in the studies above, we believe that they are relevant for the learning of caregivers to promote safe care.

CONCLUSION

The clinical simulation scenarios for health education about umbilical stump sanitization was validated and shown to be a relevant strategy to train mothers in postpartum period and their relatives to sanitize the umbilical stump safely, using correct techniques and principles before hospital discharge.

The clinical case went through a semantic validation and, later, was used in the simulated scenario, which was also validated. The simulation scenario was found to be adequate to reach the goals proposed. However, it should be tested in regard to its efficiency in increasing the theoretical-practical knowledge about the technique using randomized clinical trials.

Limitations of this study include difficulties receiving timely answers from evaluators, as happens in similar studies[23], in addition to the fact that the video with the simulation was only validated once[30]. Another limitation that stands out is the fact that current sanitary restrictions prevented performing the scenario simulation in-person. Nonetheless, this limitation could be dealt with considering that the video was validated, and this is an updated strategy[30] compatible with the current moment.

It stands out that, as long as sanitary conditions allow, the validated scenario should be used for the training of mothers in postpartum period and their relatives in order to care for umbilical stump sanitization before hospital discharge.

It also stands out that the scenario validated can be used in different contexts and with different goals, for example, to teach Neonate Nursing and train teams for care, in addition to the case presented in the study. Considering the benefits of the simulation described above, we believe that the strategy presented in this study contributes to improve assistance and provide safer care.

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