


# Technology-dependent child care in primary health care: use of simulation

*O cuidado da criança dependente de tecnologia na atenção primária à saúde: uso da simulação*

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## ABSTRACT

**Objective:** to identify and describe the contributions of simulation in the training of nursing staff in Primary Health Care for technology-dependent children. **Methods:** qualitative, exploratory and descriptive study, carried out between August and September 2018 with nursing professionals from four health centers in Florianópolis-SC, who participated in theoretical-practical training based on simulations. Data were collected through semi-structured interviews and submitted to content analysis. **Results:** two categories emerged, which addressed the contribution of simulation for the care of technology-dependent children and the weaknesses of the work process, which demand continuing education. **Conclusion:** the professionals reported perceived gains in the recovery of knowledge and in the development of skills, with a potential impact on the care of technology-dependent children, contributing to overcoming the weaknesses and barriers encountered by professionals in home care.

**Descriptors:** Continuing Education; Disabled Children; Pediatric Nursing; Primary Health Care; Simulation Technique.

## RESUMO

**Objetivo:** identificar e descrever as contribuições da simulação na capacitação da equipe de enfermagem da Atenção Primária à Saúde para o cuidado da criança dependente de tecnologia. **Métodos:** estudo qualitativo, exploratório e descritivo, realizado entre agosto e setembro de 2018, com profissionais de enfermagem de quatro centros de saúde de Florianópolis-SC, os quais participaram de capacitações teórico-práticas baseadas em simulações. Os dados foram coletados por meio de entrevista semiestruturada e submetidos à análise de conteúdo. **Resultados:** emergiram duas categorias, que abordaram a contribuição da simulação para o cuidado da criança dependente de tecnologia e as fragilidades do processo de trabalho, que demandam a necessidade de educação permanente. **Conclusão:** os profissionais relataram ganhos percebidos no resgate de conhecimentos e no desenvolvimento de habilidades, com potencial impacto nos cuidados da criança dependente de tecnologia, contribuindo para superação das fragilidades e barreiras encontradas pelos profissionais no cuidado domiciliar.

**Descritores:** Educação Continuada; Crianças com Deficiência; Enfermagem Pediátrica; Atenção Primária à Saúde; Simulação.

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## INTRODUCTION

Technology-dependent children (TDC) have a clinically complex health status and need multidisciplinary care. In addition, due to the total/partial loss of organs or body systems, they require the contribution of some technological device for the maintenance of life, such as tracheostomy, gastrostomy and oxygen therapy<sup>(1)</sup>.

Technological innovations developed over the years have enabled the survival of these clinically fragile children and allowed their care to be performed by family members, at home<sup>(2)</sup>. The home care of a TDC involves intensive family rearrangements and is commonly characterized as challenging, comprehensive, exhausting and stressful<sup>(3)</sup>.

The effective structuring of a care network, aimed at the needs of this growing population, represents a challenge for health services. One of the key issues to be overcome is the fragmentation of care provided to TDC, which have hospital services as a reference and almost no relationship with the Primary Health Care (PHC), causing fragmented and discontinued care, directed to acute situations<sup>(2)</sup>.

Thus, there is a growing need to create ways to train PHC nursing professionals to act as a support network for these children and their families<sup>(4)</sup>.

Simulation has been used in professional training and allows participants, through healthcare reality scenarios, to expand and improve their knowledge/skills<sup>(5)</sup>. To implement the simulation, low, medium and high fidelity simulators are used, aiming at the development of various skills that can be procedural, cognitive and communication skills<sup>(6)</sup>.

Scientific literature is scarce regarding the use of simulation as a teaching-learning method in the context of PHC. Furthermore, no studies were found that addressed the use of simulation as a training strategy for the PHC nursing staff for the home care of TDC.

Given the above, the following research question arises: Can the simulation contribute to the training of the PHC nursing staff for the care of TDC? To answer this question, this study sought to identify and describe the contributions of simulation in the training of the PHC nursing staff for the care of the TDC.

## METHOD

Exploratory-descriptive study with a qualitative approach<sup>(7)</sup>, carried out with nursing professionals from four health centers (HC) in the city of Florianópolis, state of Santa Catarina, from August to September 2018.

The HC were indicated by the Municipal Health Secretariat (MHS), which are responsible for the TDC due to their territory, constituting an intentional non-probabilistic sampling. The professionals eligible to participate in the study followed the inclusion criteria: working as a nursing

professional in one of the chosen HC for at least six months, having an effective link with the MHS and being in the function at the time of data collection. Participants who did not complete the planned training were excluded from the study. The number of participants was not previously defined and followed the data saturation criterion, which defines the completion of collection when the themes and categories of the data become repetitive and redundant<sup>(7)</sup>. The invitation to participate in the research was made in person, by the first author.

In the exploratory stage of the research, training was offered on the devices most commonly used by TDC at home: tracheostomy, gastrostomy, nasoenteral and urinary catheters. It was up to the professionals of each HC to choose the device(s) of interest for training.

The trainings were carried out in two moments. The first took place at the HC itself and began with a theoretical review of the devices. Afterwards, the training of procedures was offered, using low-fidelity (static pediatric manikins for training procedures) and medium-fidelity simulators (pediatric manikins with pulse and breath sound simulator), in addition to the materials for the care of each technology.

In the second moment, the professionals participated in a high-fidelity simulation, carried out on a previously agreed date, in a laboratory of simulated practices, in Florianópolis-SC. The high-fidelity simulation reproduced possible complications faced by TDC and their families, at home, which could be attended to by PHC professionals: obstruction of the tracheostomy tube, cardiorespiratory arrest, aspiration of enteral diet and urinary retention. For this stage, the following were used: a high-fidelity child simulator (which reproduced the child's physiological responses and sounds, such as coughing and crying), a simulated home environment and an actress in the role of the child's mother.

Participants acted in the scene in pairs. Before starting the simulated scene, they were submitted to the briefing, when all the materials used in the scenario, the resources and the answers offered by the simulator are explained. After this moment, the simulated scenario was performed, lasting approximately 10 minutes.

After the simulation, the professionals went through the debriefing, which lasted, on average, 20 minutes. The debriefing was structured in four phases: emotional, in which participants were asked how they felt in the scenario; descriptive, in which participants were asked to describe the entire scene; analytical, where participants were asked about the positive points of their performance and what they would do differently, in case of a new situation; and conclusive, when the participants were asked about the learning they would take from the clinical simulation, as well as were informed if they achieved the objectives of the proposed scenario<sup>(8)</sup>. It is

noteworthy that the debriefing data were not analyzed in the study.

After the training was completed, data collection was started for the descriptive stage of the study, through a semi-structured interview (average duration of 15 minutes). The interviews were carried out in single meetings with each participant (in a private room in the laboratory, without the presence of other people) and conducted by the first author. A nurse with no previous relationship with the research participants, who was interested in the research topic. She was trained to carry out the interviews by another more experienced researcher – a professor of the undergraduate nursing course – who could not be the interviewer because she had a previous relationship with some participants. For the interviews, the following guiding questions were used: Did the training program reach the proposed objective? Why? What are the positive and negative aspects of the method used in training (that is, the simulations)? What should be changed? In your opinion, does the simulation contribute to preparing the PHC nursing staff for the TDC care? Do you feel empowered to support TDC and their families at home? Why? In addition, participants' characterization data were collected.

The interviews were audio-recorded and, during the collection, they were transcribed and submitted to content analysis, in its thematic modality<sup>(9)</sup>. The analysis comprised three stages for its operationalization: pre-analysis, from the floating reading and constitution of the corpus; exploration of the material with codification (carried out by the first author), from the clipping of the text in the registration units; and treatment of the results obtained and interpretation, working with meanings emerging from the data. From this process, two categories emerged: The contribution of simulation to technology-dependent child care in the context of PHC; and Weaknesses in the work process and the need for continuing education.

This study followed the guidelines of the Consolidated Criteria for Reporting Qualitative Studies (COREQ) and the standards of Resolution 466/2012 of the National Health Council, approved by the Research Ethics Committee of the Federal University of Santa Catarina (CAAE 55922616.1.0000.0121, Opinion No. 1,556,428). All participants previously signed the Free and Informed Consent Form.

To maintain the confidentiality of those involved, the names of the participants were replaced by letters and numbers: for nurses, the letter E was used, followed by the order of the interview (E1, E2, E3, etc.). To designate the nursing technicians, the letter T was used, also followed by the order of the interview.

## RESULTS

Eighteen nursing professionals participated in the training; however, seven were excluded for not completing the training, totaling eleven participants. As the emerging elements in the interview were being repeated with this number of participants, the researchers understood that theoretical saturation had been reached, based on the available data.

Regarding the characterization, the participants were mostly female (n=10.91%), 54.5% (n=6) were nurses and 45.4% (n=5) were nursing technicians. They had, on average, 42 years old, 15 years of experience and six years of experience in the current HC. Regarding the choice of devices to be addressed, 10 professionals chose the tracheostomy and one professional chose the nasoenteral catheter.

The content analysis, carried out from the obtained reports, resulted in two categories, presented below.

### The contribution of simulation to technology-dependent child care in the context of PHC

This category presents the aspects of the teaching strategy used, bringing the contribution of simulation to the construction/consolidation of knowledge for the care of technology-dependent children.

The use of a strategy that links theory with practice was one of the most highlighted themes during the interviews, enabling the professional to retrieve knowledge and previous experiences, which end up being forgotten in the daily reality:

*[...] thinking about a theoretical rescue linked to practice, thinking about the need outside the hospital environment, right? And bringing home as a scenario, I found it very positive (E3). All of this has been done, it has already been... it has been taught, we have worked with it long before, but we forget over time, we are no longer in that practice, right, and then it was reinforced (T3).*

Another positive point highlighted was allowing the professional to develop and improve procedural/technical skills, as well as improvements in decision-making and clinical reasoning:

*[...] so you have this simulation, it gives you this possibility of seeing possibilities, even of performing that technique, [...] having the objects and material that you would have more easily in the hospital and as well as the vision, this learning, bringing more to reality (E3).*

*Because it was something I had never done, witnessed like this in my course. I did an internship at the hospital, it was a very quick thing, just aspiration (tracheostomy) and that is it, but*

*not that process, [...]everything in the case: the procedure, the logistics, what do you do first (T5).*

The improvement of relational skills was another point highlighted from the simulated experience. The professional realizes that there is a need to support the family member who takes care of a TDC; with this, there is greater awareness of the topic exposed:

*[...] but it is something we deal with a lot on a daily basis: home visits, the anguish of the mother or father, the caregiver, in short... and we have to know how to deal with it, even to feel calm (T4).*

*No, it was interesting, that we saw the... despair of the mother, who interpreted very well, a scene of crying. And the simulation was very interesting, you end up feeling in the situation, it was very... very strong, it moved me (T5).*

The sense of realism provided by the use of dramatization, the high-fidelity simulator and the objects commonly found in the home was another point highlighted in the speeches. Because they help professionals to recognize and identify some of their daily practices:

*[...] because this makes the professional see what can happen with all the characteristic signs, not just in theory, we can see it in practice, especially with a puppet that does all that. And the question of you simulating the family member, simulating the whole situation, I thought... we feel as if we were really at home (E4).*

Furthermore, even though they do not have frequent contact with the TDC, professionals realize that there is a need to know the care, because, in a real situation, they need to be prepared and qualified. In this sense, they recognize that simulation contributes to patient safety, preventing errors:

*[...]so it contributes a lot, because we end up thinking about the possibilities, seeing what went wrong, how are we going to do it next time, with the real child (T1).*

## The weaknesses of the work process and the need for continuing education

The participation of professionals in the proposed training program raised reflections on the challenges for the care of TDC at home, highlighting weaknesses in the work process.

There was a lack of knowledge about the population of technology-dependent children in the unit's territory, even though the CH that had at least one TDC in their area were chosen:

*[...] we do not have this contact with the patient who goes home, as we always say: this has to come to us as a team, so we can follow up. I think it would be easier for the family, for the hospital, it would improve a little due to the hospital demand and we could have a more effective practice, more guidance... (E2).*

*That is why I am telling you, if there are these children in the children's hospital and there is this program, it is because there are children who need it – where are these children? (E2).*

It was observed that, for some professionals, there is a fragmented perception of the PHC attributions as organizer of the Health Care Network and coordinator of care. The professionals' speeches reflect that many of them see tertiary care as a reference for TDC care. They describe PHC itself as a support service, delivery of materials and specific services:

*[...] maybe in a little while the children's [hospital] will say that it can no longer handle this demand from children and the public network nurse will have to... and the doctor will have to provide this sustainability, this support. Then, at least, we will be one step ahead (E2). [...] it is usually the hospital clinic – this child stays there, is not it? Then, the family, too, I think they have a little more security, when looking for care directly there, because of the experience, the ease of access and, often, the quicker response. And even regarding hospital discharge, it is very difficult for us to receive... this call from the hospital, for a situation of a child who is discharged. We will know, many times, because of the family's need to obtain some material and have been looking for it. But it is more due to the search for material than for care, not that the child does not have regular care, but this care ends up being through the hospital. (E4)*

Furthermore, from the reports, a need for continuity in the training carried out is perceived. The professional realizes that there is a weakness in the offer and continuity of the training carried out and understands the importance of this type of practice:

*[...] this must be redone, from time to time, because there are many things, and when you do not have the practice, when it is not your day to day, you end up forgetting (T2).*

*Not prepared, prepared I will be lying to you. I think I would need to have more grounding, more knowledge, more experience of a situation (T5).*

## DISCUSSION

Nursing proofs are identified as one of the main forces of change in PHC practices, as they focus on comprehensive care<sup>(10,11)</sup>. To provide effective and quality care, professionals need to develop several skills, for which, not always, training courses are enough.

It is noticed that it is not part of the routine of PHC professionals to look at children with chronic health conditions, as is the case with the TDC. This is reflected in the lack of screening, care planning and periodic monitoring of these children, who are, in most cases, delegated to the tertiary sector<sup>(12)</sup>.

Therefore, innovative strategies are needed, aiming at the rescue and consolidation of new knowledge, which promote changes in the work process. Simulation, considered an educational strategy and used in undergraduate courses, is still little used (or at least documented) in training for PHC professionals<sup>(6,13)</sup>.

It is important to highlight that, unlike undergraduate students, professionals have a trajectory that influences their experience with simulated practice. Such previous experiences are elements that support the development of clinical competences. This is because it is believed that the professional, when faced with unprecedented and unique situations, relies on these experiences to lead and manage future situations<sup>(14,15)</sup>.

Furthermore, the simulation strategy provides the development of critical thinking, which enables the professional to question the practice performed, analyze its context, investigate the hypotheses, argue about the causes and to try new approaches to care<sup>(16)</sup>.

In this study, participants were able to identify the development of procedural and relational skills, in addition to decision-making and clinical reasoning. Other gains obtained, which have a direct impact on the care of stuffed children, are related to the approximation of reality that the simulation promotes. This stimulates the same emotional and psychological responses that the professional would present in a real situation, which further encourages the development of critical thinking and decision-making.

In addition, the confidence developed is another perceived gain, because professionals perceive improvements related to patient safety, when they feel more confident in carrying out care and have the opportunity to correct the error in the simulated situation<sup>(13)</sup>.

The organization of health care at the TDC must be oriented towards comprehensive care, aiming to meet their unique needs and not just those inherent to their health condition. Assistance aimed at specific care and actions is unable to meet the needs of these children, who need care that overcomes the barriers imposed by their condition and provides opportunities for the development of their potential,

regardless of their clinical condition. Therefore, it is necessary that the PHC nursing staff provide continuous, responsible and committed care<sup>(17)</sup>.

However, it is noted that, in everyday reality, there is no accountability for the care of TDC. The absence of accountability is often due to the professional's lack of preparation and technical-scientific knowledge. They cannot visualize forms of assistance beyond those common to their daily lives, in addition to the ineffective communication between tertiary care and PHC, evidenced by a weakened referral and counter-referral system<sup>(18)</sup>.

A study points out that the facilities found for good care are commonly associated, among other causes, with the recognition and appreciation of the nursing staff in relation to its territory and its managers, as well as its participation in continuing health education actions<sup>(19)</sup>. This study corroborates the statements of professionals in this research, who understand the importance of keeping up to date, aiming to overcome the vulnerabilities of the work process.

Participants show that there are weaknesses in the offer and continuities of these trainings, negatively affecting professional qualification, as they reflect that specific training does not influence changes in practice. This perception is in line with the statements of the National Policy on Continuing Education (Portuguese acronym: PNEP), created in 2009. Which considers training as one of the strategies related to Continuing Education in Health (CEH) to face problems in health services<sup>(20)</sup>.

However, when based on specific activities, training does not always meet the health needs of a population or a health service<sup>(20)</sup>. It is believed, therefore, that isolated training is not considered the best way to produce changes in work processes, needing to be redone from time to time, based on the professionals' needs.

In this sense, based on the results of the present study, it is considered that simulation is a strategy that can contribute to consolidating an CEH program aimed at PHC professionals who have TDC in their coverage area. However, for educational actions to be effective and sustainable, they must emerge from the daily needs of professionals, based on the knowledge of TDC discharged from hospitals.

In this sense, it is proposed that the CEH program is linked to an effective hospital counter-referral process, in which communication with the PHC should, ideally, start even before hospital discharge. From this communication, if the PHC staff deems it necessary to train or update on the necessary care for that TDC, the educational program based on simulations would be triggered.

Despite the important contribution to the scientific literature, this research presents, as a limitation, results based only on the professionals' perspective. Considering that the proposal is innovative, it is understood that the design



adopted by this study was ideal for exploring the potential of simulation in the proposed context. However, aiming at the advancement of scientific knowledge, it is recommended to carry out more methodologically robust studies, which investigate the impact of simulation as a strategy for the CEH of PHC professionals, with regard to the care of TDC.

## CONCLUSION

This study identified the contributions of the simulation, from the perspective of participants in a training program aimed at home care for TDC. Professionals reported perceived gains in the recovery of knowledge, in the development of skills and in patient safety, with a potential impact on the care of these children.

The experience also stimulated the participants' reflection on the weaknesses and barriers encountered by professionals in the home care of TDC. Based on these reflections, new forms of approach and care were discussed, contributing to overcoming the reported difficulties.

It is concluded that simulation has the potential to be used as a strategy for the CEH of these professionals. For this purpose, educational actions must be planned to occur continuously and linked to the needs of professionals, triggered from the process of hospital counter-referral of the TDC.

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