


## Educational technologies developed for the care of children with gastrostomy: An integrative review

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### ABSTRACT

**Introduction:** The educational technologies developed for the care of children with gastrostomy can help guide current educational and care practices. **Objective:** To identify the available evidence on the educational technologies developed for the care of children with gastrostomy. **Method:** This is an integrative review that considered the search in the following databases: Latin American and Caribbean Literature on Health Sciences, Online System for Search and Analysis of Medical Literature, Nursing Database and Google Scholar. **Results:** The technologies found were of the light-hard type, including booklets, standard operating procedures, educational manuals and videos. **Conclusion:** The available technologies are used by nursing, playing a fundamental role in the health education of caregivers of children with gastrostomy, especially in relation to complications and handling of the tube for feeding, cleaning and bathing.

**Keywords:** Gastrostomy, Child, Educational Technology, Validation Study.

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## INTRODUCTION

A gastrostomy is a type of ostomy that consists of an artificial opening of the upper digestive tract, establishing communication between the stomach and the external environment through an access tube that connects the stomach to the abdominal wall, ensuring a safe route for nutrition, hydration and administration of medications in patients whose oral route is unable or at risk of feeding (SILVA et al., 2019).

The pediatric population has shown a growing demand for the use of gastrostomy tubes (RIBEIRO et al., 2022). However, in Brazil, there is still a lack of literature on the prevalence of Enteral Nutritional Therapy, as well as on the number of children with gastrostomies. The few existing studies focus on the characterization of the sociodemographic and clinical profile, conducted at the local or regional level (SILVA et al., 2019).

Most children who use the gastrostomy tube are premature, have abnormalities in the upper digestive tract, malformations of the central nervous system and neuropsychomotor delay, with a predisposition to dysphagia in the oropharyngeal phase. This indication can be temporary or permanent, depending on the needs of each child (CUNHA; BRITO; PANTOJA, 2021).

The care of children with gastrostomy should follow a plan that ensures adequate nutritional intake, prevents infections, avoids skin lesions around the gastrostomy, and can prevent and identify problems and complications early (RODRIGUES, 2017).

Research in Brazil identified that nurses were the ones who most performed the first gastrostomy tube change in children (SILVA et al., 2019). However, there is still fear, doubt, and insecurity among these professionals during the procedure. Some face difficulties in handling these and other devices, making it necessary to use new technologies, protocols, and in-service training (FAVARO et al., 2020).

Technologies are products or processes that allow the involvement of professionals in the provision of care to the user and in the development of the health education process, contributing to the provision of relevant information to the target audience (NIETSCHE, 2014).

Thus, the educational technologies developed for the care of children with gastrostomy can help to guide current educational and care practices. As the leader of the nursing team, the nurse has a fundamental role in directing the care to be provided to these patients, which should always be based on the best available evidence on the subject. Therefore, it is essential to identify the available evidence on the educational technologies developed for the care of children with gastrostomy.

## METHOD

This is an integrative literature review (MENDES; SCOTT; GALVÃO, 2008). Among the review methods, the integrative review is the broadest, allowing the simultaneous inclusion of



experimental and quasi-experimental research, providing a more complete understanding of the topic of interest. The elaboration of the integrative review consists of the following steps:

1. Definition of the guiding question to be answered;
2. Conducting the search to identify and collect as many relevant primary surveys as possible within the previously established inclusion and exclusion criteria;
3. Critical analysis of the criteria and methods used in the various studies selected to determine whether they are methodologically valid;
4. Systematic evaluation of the selected studies;
5. Interpretation and synthesis of data;
6. Conclusions and presentation of the integrative review.

To prepare the guiding question, the IOP strategy adapted from the acronym PICO was adopted, as follows: P (Population): children with gastrostomies; I (Intervention): development of educational technologies; O (Expected outcomes): evidence for the care of children with gastrostomy (FINEOUT-OVERHOLT; STILLWELL, 2019).

Thus, the following research question was formulated: What evidence is available in the literature on educational technologies developed for the care of children with gastrostomy?

The following inclusion criteria were considered: scientific documents in English, Portuguese and Spanish, without time frame, that addressed the topic of interest and that answered the guiding question. Duplicate studies were excluded.

The data collection of this review was carried out in October 2022, through searches in the Nursing Database (BDENF), Latin American and Caribbean Literature on Health Sciences (LILACS) and Online System for the Search and Analysis of Medical Literature (MEDLINE), with access through the Virtual Health Library, IBECs (via VHL) and Google Scholar.

Controlled descriptors were selected to set up strategies for searching the articles, which were extracted from the Health Sciences Descriptors (DeCS). Thus, in the LILACS, BDENF, IBECs and MEDLINE databases, the following crossings were used: Gastrostomy AND educational technologies, gastrostomy AND validation, gastrostomy AND educational technologies, gastrostomy AND children.

It should be noted that all the scientific works used were duly cited in accordance with Law No. 9,610/98, which conceptualizes the relevant aspects in relation to the scope of copyright (BRASIL, 2016).

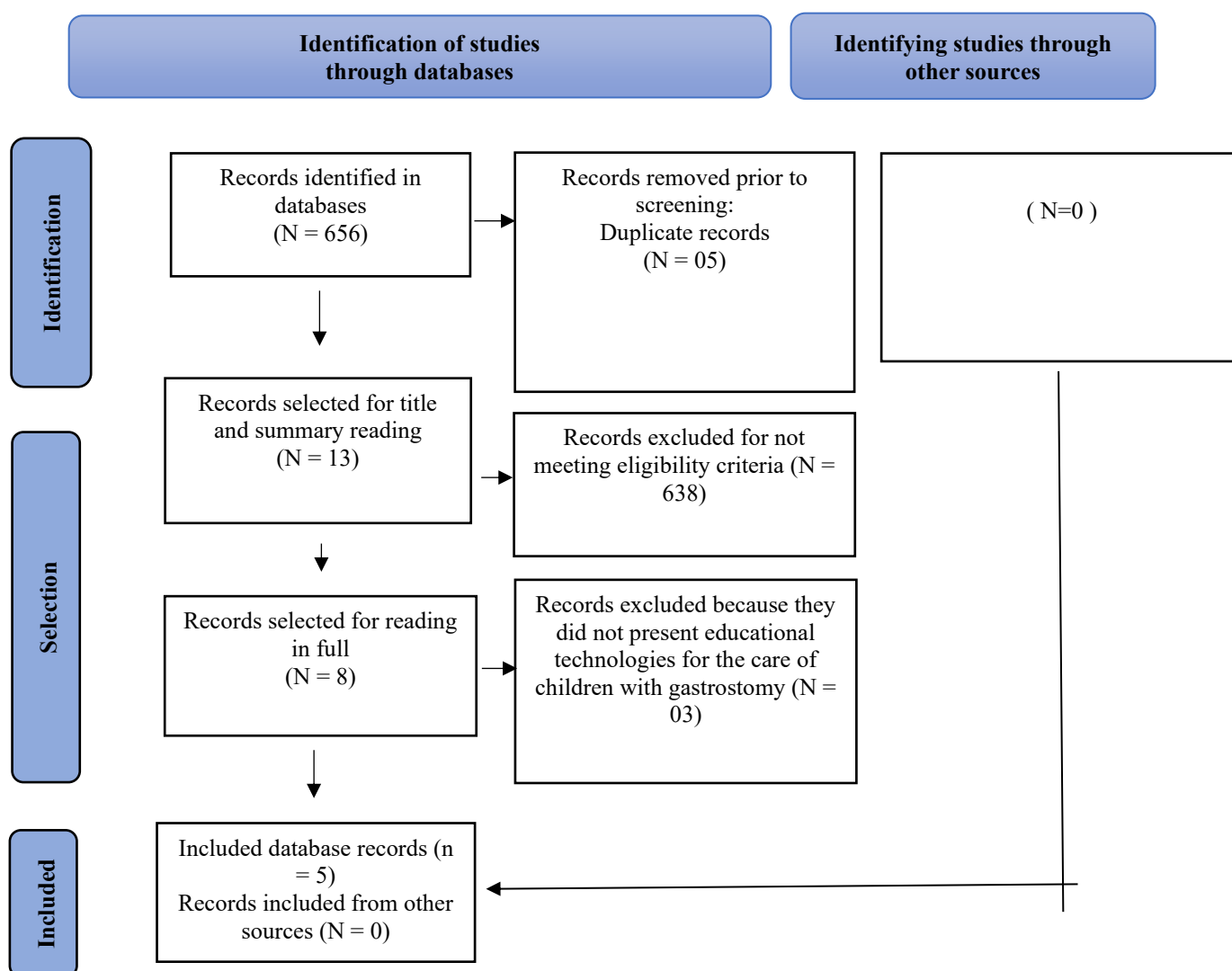
## RESULTS

In the implementation of the search strategies in the selected databases, 656 scientific studies were found that addressed the gastrostomy theme. Electronic searches were performed in five

databases: LILACS, BDNF, MEDLINE, IBECS and Google Scholar. After eliminating the publications that were not related to the theme, 13 studies remained. After eliminating the duplicates, eight scientific papers were selected for reading in full. Of these, only five were included according to the eligibility criteria.

To visualize the selection and screening path of scientific studies for integrative review, the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) tool was used, as illustrated in Figure 1.

Figure 1 - Illustrative flowchart of the screening and selection process of studies, based on the PRISMA recommendation. Best Time to See Fortaleza, Ceará 2022



Fonte: PRISMA (*Preferred Reporting Items for Systematic Review and Meta-Analyses*)

The reasons for the exclusion of publications (n=638) were: literature review and studies that did not answer the guiding question. These exclusions were necessary to ensure that only the most relevant and methodologically appropriate studies were included in the integrative review, ensuring the quality and relevance of the evidence analyzed.



The studies selected for inclusion were carefully evaluated for their general characteristics. The tables present these characteristics in detail, including information about the authors, year of publication, type of study, area of publication, and the main elements of the study. The tables allow a comprehensive and structured view of the analyzed works, facilitating the comparison and interpretation of the data.

Chart 1-Summary Table of Publications on Educational Technologies in Gastrostomy Care

No.	Authors	Title	Objective	Methodological Design
1	RODRIGUES, L.N. et al. Rev Bras Enferm., 2020.	Construction and validation of an educational booklet on care for children with gastrostomy.	To describe the process of construction and validation of an educational booklet aimed at caregivers of children with gastrostomy.	Methodological study in five stages: bibliographic survey; situational diagnosis; construction of illustrations, layout, design and texts; validation with experts and calculation of the Flesch Legibility Index; validation with the target audience. Content Validity Indexes and Suitability Assessment of Materials applied.
2	LIMA, P. S. et al. Reme: Rev. Enferm., 2018.	Educational manual for the care of children with gastrostomy: construction and validation.	Develop and validate an educational manual on gastrostomy care in children.	Bibliographic survey, content development and validation with 11 experts via the Delphi technique and with five parents/caregivers via the Likert scale.
3	LENGRUBER, M. R. et al. Research, Society and Development, 2021.	Elaboration and development of an educational video in health "Knowing the Gastrostomy".	Describe the creation of an educational video about gastrostomy.	Methodological study of qualitative nature, developed in three phases: pre-production, production, post-production
4	CALDAS, A.C.S. et al. Escola Anna Nery, 2019.	Sensitive and creative production of careful-educational technology for families of children with gastrostomy.	To produce educational technology based on Peplau and Freire models for families of children with gastrostomy.	Qualitative descriptive research with 13 family members, using semi-structured interviews, observation, and thematic analysis.
5	CRUZ, S. D. R. et al. Revista Enfermagem Atual In Derme, 2019.	Gastrostomy catheter in children: elaboration of standard operating protocols.	Develop and validate SOPs for gastrostomy catheter exchange and care.	Methodological method in two stages: construction of SOPs and validation by judges. Analysis included calculation of the Content Validity Index.

Source: Prepared by the authors with data from the research



Chart 2 - Results and Conclusions of Research on Educational Interventions for Gastrostomy Care

No.	Results	Conclusion
1	Content Validity Index of 0.93; Suitability Assessment of Materials of 85.2%; legibility of 72%. Material considered coherent and adequate by the caregivers.	Booklet validated as useful for caregivers, contributing to good practices in the care of children with gastrostomy.
2	Validation reached agreement of 97.91% of the experts; All caregivers totally agreed. Manual includes 21 pages, 8 chapters and 38 figures.	Manual considered valid for use, facilitating home care and prevention of complications.
3	First round of evaluation with CVI of 93%, second round with 97%; considered acceptable 80%.	Video serves as a didactic and technological tool for health education, filling knowledge gaps.
4	Development of a booklet based on identified problem situations, containing 24 pages and nine topics.	Booklet validated as a sensitive and useful resource for assistance and teaching.
5	SOPs on catheter exchange and care validated with IVCs of 0.87 and 0.83, respectively.	SOPs validated as effective, with modifications suggested and accepted for clinical practice

Source: Prepared by the authors with data from the research

The educational technologies most present in the studies were of a printed nature, including booklets, manuals and SOPs, followed by audiovisual technologies, such as videos. Four of the studies presented technologies in printed format and one used video as a tool for teaching. It was common among the studies to search for educational technologies already produced and published in the literature, as well as the discussion about the importance of educational approaches aimed at patients and caregivers. Some approaches include guidance that begins in the preoperative period.

## DISCUSSION

The search for technologies aimed at gastrostomy in pediatrics was necessary to confirm the scarcity of published studies. Five publications focused on the care of children with gastrostomy were found, which points to a lack of studies published on this topic, evidencing an increase in publications related to educational technology in the last five years (LENGRUBER et al., 2021; RODRIGUES et al., 2020; CRUZ et al., 2019; LIMA et al., 2018).

Of the studies analyzed, the authors addressed complications when using the gastrostomy tube, home care, handling, bathing, hygiene, medication administration through the catheter, adequate replacement period, reasons for accidental exit, complications, and the experience of family members in the care of children with gastrostomy (RODRIGUES et al., 2020; CRUZ et al., 2019; LIMA et al., 2018).

It is noteworthy that printed and digital technologies (booklets, SOP and manual) were the most cited in the studies. It should be noted that some of the studies do not make clear the format of delivery of technology to caregivers or professionals, whether printed or digital. The only ones that demonstrated that the technology was printed were the studies of the elaboration of booklets, by



Rodrigues *et al.* (2020) and Caldas *et al.* (2019). Next, audiovisual resources (video) stand out, commonly studies use the combination of various methods for health education. It is believed that this issue is related to the possibility of these various strategies complementing each other in order to facilitate the process of guidance and education in health.

In the study by Rodrigues *et al.* (2020), which presents the construction and validation of an educational booklet, the authors highlight that printed educational technologies are considered viable methods in order to sensitize and educate the target audience, in addition to opening space for a collective construction of knowledge among professionals and the population, constituting the use of new resources for teaching-learning.

It is emphasized that the importance of the active participation of caregivers in the teaching and care process is fundamental, considering that an educational material has been prepared and will be intended for them, so the shared learning space between professionals and caregivers becomes indispensable for the success of the process, in addition to allowing the use of a language that is more accessible.

A study carried out by Lima *et al.* (2018) developed and validated a manual for the care of children with gastrostomy, as a focus of guidance for parents and caregivers of children with gastrostomies. The authors used accessible language, which aimed to make the content attractive and understandable.

Among the advantages of these methodologies used by nurses, the ease of implementation, accessibility to all levels of education and low cost stand out, being a resource of readiness available at home for consultation in the event of doubts (RODRIGUES *et al.*, 2020).

Printed educational technologies also have their disadvantages and limitations, such as the need to update in the face of constant changes in the health field. In this digital age, printed resources can quickly become outdated (WILL, 2022). However, this does not cancel out the use of printed resources, considering that not all people have access to the internet, or even know how to deal with such a tool.

In another study carried out by Cruz (2019), whose objective was to develop and validate two Standard Operating Protocols (SOPs), one for changing the gastrostomy catheter in children and the other for care with it, the results listed to address the topic were complications and care with gastrostomy, the difficulties and facilities in care for gastrostomy, and the experience of family members in the care of children with gastrostomy.

Lengruher's (2021) work, on the other hand, was to develop an educational video in order to fill the knowledge gap between lay people with a didactic and technological instrument for health promotion, since it brings together elements that are easy to understand through a creative dynamic.



Given the availability of printed, digital or audiovisual material, it is necessary to be presented in an accessible way to meet everyone's needs. Thus, it consists of one of the criteria for the validation of educational technologies, accessibility. For this, these materials must be prepared with simple and accessible language, easy to understand and interpret, both the presentation of the text and figures must be adequate to take advantage of the resource (RODRIGUES *et al.*, 2020).

Thus, by using educational technologies, it is possible to offer the public a solid base of knowledge for a better understanding of the information and the ability to form a critical opinion on a given topic.

It is suggested the construction and validation of other educational technologies capable of evaluating the long-term impact of these technologies on the quality of life of children and their families/caregivers.

## CONCLUSION

The integrative review showed that the care of children with gastrostomy is complex and that there is a lack of studies on the standardization of techniques in relation to this care. In view of this finding, it is essential to conduct new studies on the subject, in order to support the care of patients with gastrostomy, especially children who need this procedure to achieve a better quality of life.

The information collected in the technologies presented can contribute to improving the care directed to these patients. The active participation of those responsible for care becomes indispensable for the success of the child's education, recovery and rehabilitation. It is also noteworthy the role of nursing in health education for caregivers of children with gastrostomy, especially related to complications and handling of the tube for feeding, cleaning and bathing.





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