

Validation of an Educational Guidance Instrument for Caregivers of Children on Home Mechanical Ventilation

Validação de um Instrumento de Orientações para Cuidadores de Crianças em Ventilação Mecânica Domiciliar
Validación de un Instrumento de Orientación para Cuidadores de Niños en Ventilación Mecánica Domiciliar

RESUMO

Objetivo: Validação de conteúdo de cartilha sobre ventilação mecânica invasiva (VMI) domiciliar para cuidadores de crianças dependentes crônicos. **Métodos:** Estudo quali-quantitativo de validação de conteúdo, por juízes-especialistas, de um instrumento de orientação do tipo cartilha educativa. Utilizou-se o Índice de Validação de Conteúdo (IVC), considerando $IVC \geq 0,8$ para validação com uma amostra mínima de 10 juízes. Pesquisa aprovada pelo Comitê de Ética em Pesquisa (CAAE 75912223.7.0000.0096). **Resultados:** 20 participaram da primeira rodada e 19 da segunda, sendo 52,63% especialistas. O tópico sobre água no filtro, que obteve IVC em Clareza e Relevância de 0,6 e 0,7, respectivamente, foi excluído e a página reformulada com base em 44 sugestões. Na segunda rodada, os tópicos apresentaram $IVC \geq 0,9$ e IVC global de 0,95. **Conclusões:** O conteúdo do instrumento foi validado, demonstrando que é claro, relevante e adequado.

DESCRITORES: Educação em Saúde; Letramento em Saúde; Desinstitucionalização; Estudo de Validação.

ABSTRACT

Objective: To validate the content of an educational booklet on home invasive mechanical ventilation (IMV) for caregivers of children with chronic dependence. **Methods:** A qualitative–quantitative content validation study of an educational guidance instrument in booklet format, conducted by expert judges. The Content Validity Index (CVI) was used, considering $CVI \geq 0.8$ for validation, with a minimum sample of 10 judges. The study was approved by the Research Ethics Committee (CAAE 75912223.7.0000.0096). **Results:** 20 judges participated in the first round and 19 in the second, with 52.63% being specialists. The topic regarding water in the filter, which obtained CVI values of 0.6 for clarity and 0.7 for relevance, was excluded, and the page was reformulated based on 44 suggestions. In the second round, all topics presented $CVI \geq 0.9$, with a global CVI of 0.95. **Conclusions:** The content of the instrument was validated, demonstrating that it is clear, relevant, and appropriate.

KEY WORDS: Health Education; Health Literacy; Deinstitutionalization; Validation Study.

RESUMEN

Objetivo: Validar el contenido de un folleto educativo sobre ventilación mecánica invasiva (VMI) domiciliar para cuidadores de niños con dependencia crónica. **Métodos:** Estudio cualitativo–cuantitativo de validación de contenido, realizado por jueces expertos, de un instrumento de orientación en formato de folleto educativo. Se utilizó el Índice de Validez de Contenido (IVC), considerando un $IVC \geq 0,8$ para la validación, con una muestra mínima de 10 jueces. El estudio fue aprobado por el Comité de Ética en Investigación (CAAE 75912223.7.0000.0096). **Resultados:** Participaron 20 jueces en la primera ronda y 19 en la segunda, de los cuales el 52,63 % eran especialistas. El tema relacionado con el agua en el filtro, que obtuvo valores de IVC de 0,6 en claridad y 0,7 en relevancia, fue excluido, y la página fue reformulada con base en 44 sugerencias. En la segunda ronda, todos los temas presentaron un $IVC \geq 0,9$, con un IVC global de 0,95. **Conclusiones:** El contenido del instrumento fue validado, demostrando que es claro, relevante y adecuado.

DESCRIPTORES: Educación en Salud; Alfabetización en Salud; Desinstitucionalización; Estudio de Validación.

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INTRODUCTION

The increased accessibility of home mechanical ventilation in recent decades has led to changes in the care and survival of children and adolescents with chronic and complex clinical conditions, highlighting the specific needs of this substantially growing population¹. The increased availability and improvement of portable ventilators and home-use medical devices, coupled with the rising morbidity among these children, have contributed to the increased use of invasive and non-invasive mechanical ventilation in the home setting in recent years^{2,3,4}.

For the process of discharging these chronically ill children dependent on invasive mechanical ventilation to be successful, strong family adherence to the child's care is necessary, which, in turn, is directly related to functional health literacy skills. Functional Health Literacy (FHL) refers to an individual's cognitive ability to read, interpret, and understand the information made available and conveyed in the context of health services, as this information is fundamental for making therapeutic decisions and for maintaining the patient's care and well-being^{5,6}.

Low proficiency in FHL compromises an individual's ability to under-

stand, interpret, and use health-related information, increasing exposure to risk factors and, when affected by an illness, limiting the ability to make assertive decisions during the therapeutic process^{7,8}.

Thus, there is a clear need for health education programs to utilize Educational Technologies (ET) to mediate and facilitate the teaching-learning process for caregivers, incorporating educational resources such as brochures, educational videos, leaflets, booklets, and posters. Such resources have been used for decades to disseminate health information, whether to reinforce verbal guidance or to foster health-promoting behaviors—however, their development requires experience and/or well-established scientific research^{9,10}.

The validation of this content is an essential step in the development of health information resources, since it reduces the risk of disseminating a tool that contains weaknesses or subjective and unsubstantiated judgments on the subject, while also ensuring that the material is clear, easy to understand, and well-presented¹¹. Thus, it is evident that validation is essential for the development of highly reliable resources, and this study aims to validate the content of a guidance tool for caregivers of children and adolescents using home inva-

sive mechanical ventilation.

METHODOLOGY

This is a methodological study with a quantitative-qualitative approach to the content validation of an Educational Technology (ET) guidance tool, in the form of a booklet, for caregivers of children on home invasive mechanical ventilation, conducted by expert judges from May 2025 to September 2025. This study follows the guidelines of the *Revised Standards for Quality Improvement Reporting Excellence* (SQUIRE 2.0). The research was approved by the Research Ethics Committee of the Hospital de Clínicas of the Federal University of Paraná, under CAAE 75912223.7.0000.0096, ensuring compliance with the recommendations of Resolution No. 466/12.

Development of the Educational Technology

The material production process consisted of developing the first version of the educational technology (ET) at the Pediatric Intensive Care Unit of the Hospital de Clínicas Complex of the Federal University of Paraná in 2023. In May and June 2025, the material was reviewed, and adjustments were made to the layout, content, and illustrations

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Table 1 - Characteristics and professional background of the expert judges (n=19).

Variable	n=19	%
Gender		
Female	17	89,47%
Male	2	10,53%
Age group		
20–30 years	8	42,11%
30–40 years	8	42,11%
40–50 years	3	15,79%
Duration of vocational training		
2–3 years	5	26,32%
4–6 years	3	15,79%
10+ years	11	57,87%
Degree		
Undergraduate	1	5,26%
Specialist	10	52,63%
Master	5	26,32%
Doctor	3	15,39%
Professional field		
Pediatric Physical Therapy	7	36,84%
Neonatal Physical Therapy	2	10,53%
Neonatal and Pediatric Physical Therapy	8	42,11%
Neurofunctional Physical Therapy	1	5,26%
Teaching	4	21,05%
Region of professional activity		
North	2	10,53%
Northeast	1	5,26%
Southeast	6	31,58%
South	10	52,63%

Figure 2 – Data collection flowchart. Curitiba-PR, Brazil, 2025. By the authors.

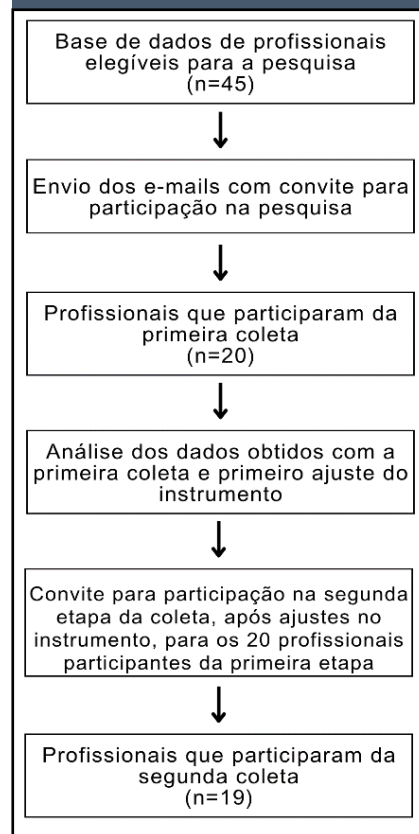


Table 2 presents the consensus data from the expert judges in the first evaluation of the TE, with the Agreement Rate and IVC for each topic

evaluated on all pages of the booklet. On Page 2, the topic “Moisture” regarding the barrier filter obtained an IVC <0.8, with a 55% Agreement

Rate for Clarity and IVC values for Clarity and Relevance of 0.6 and 0.7, respectively (Table 2).

Table 2 - Presentation of consensus among expert judges in the First Evaluation of the educational booklet (n=20). Curitiba-PR, Brazil, 2025.

Content evaluated	Proportion of agreement among judges			
	% Relevance	IVC ¹	% Clarity	IVC
Page 1 – Initial presentation				
Opening greeting	95%	0,95	100%	1,00
Presentation of the material	100%	0,90	95%	1,00
Page 2 – Barrier filter				
Topic: “Why Use It”	100%	0,95	95%	0,95
Topic: “Exchange”	100%	0,90	90%	0,95
Topic: “Exchange Date”	100%	1,00	100%	1,00
Topic: “Cleaning”	95%	0,85	80%	0,85
Topic: “Dirt and discoloration”	95%	0,90	85%	0,90
Topic: “Moisture”	85%	0,60 *	55% *	0,70 *

In their comments, the judges highlighted the need for terminological simplification of the content in the TE, pointing out the excess of technical terms, which may be misunderstood by the user, and suggesting the use of more colloquial words, or even complete rewriting of the topic.

I suggest putting simpler words in parentheses to help family members understand better, for example: circuit (hose)(...). (J5)

Perhaps replace the word 'utilized' with 'serves'. (J20)

(...) To make it even clearer, I suggest: condensation (presence of water droplets).(...) (J16)

The judges' accounts of their professional experience were evident in the comments, enriching the construction and validation of the TE, given that professionals from different regions of the country participated in the study, contributing their local clinical practices.

(...) I offer this suggestion based on my own experience with a mother who had very little formal education. (J11)

"(...) I have had patients on home ventilation and have seen this happen

in practice. (J13)

Suggestions for supplementing content and adding images were also frequently found in the feedback. As a result, the judges reflected on the need for a more visual and clear TE, with a focus on the user's experience with the material.

I suggest explaining it better (...) by giving examples and including images (...). (J14)

Include images and arrows to better illustrate the proper positioning. (J7)

I suggest images comparing what a clean filter would look like versus a dirty one, showing what kind of coloring would be appropriate. (J10)

The highest concentration of suggestions was found on page 2, specifically in the section regarding the presence of moisture in the barrier filter. Here, the judges suggested rewriting the sections, highlighting the lack of clarity on the page, information, and factors that could confuse the user and the evaluation, as well as removing the section.

Water in the filter? Along with dirt? (... (J4)

Does this refer to the water level? To water accumulation? It could be explained more clearly. (J18)

There is no water in the HEPA filter; I would remove this item. (...) (J6)

Following the qualitative and quantitative analysis, it was observed that a complete restructuring of page 2 was necessary, given that the clarity of this specific page was inadequate. Thus, the "Humidity" topic was removed, and the page was completely restructured, considering: 1) the inclusion of educational images; 2) reorganization of the topics; and 3) the use of colloquial language to improve understanding of the educational material.

After the revision and restructuring of page 2, a new round of evaluation by the judges (n=19) was conducted. In this second evaluation, the IVC remained above 0.94 for all topics (Table 3). Finally, the overall IVC of the instrument was calculated at 0.95, and the remaining suggestions were analyzed and applied to the instrument according to feasibility and intended objectives.

Table 3 – Presentation of the consensus among expert judges in the Second Evaluation (n=19).

Content evaluated	Proportion of agreement among judges			
	% Relevance	IVC ¹	% Clarity	IVC
Page 2 – Barrier Filter				
Topic: "Why use it"	100%	1,00	100%	1,00
Topic: "Filter replacement"	100%	1,00	100%	1,00
Topic: "Replacement date"	100%	0,95	100%	0,95
Topic: "Replacement frequency"	94,74%	1,00	94,74%	0,95
Topic: "Disposal"	100%	1,00	100%	1,00

DISCUSSION

The booklet-style TE for caregivers of children dependent on home

mechanical ventilation (HMV) was validated with an IVC above 0.8 and a concordance rate above 94% per topic and overall with an IVC of 0.95. This

validation process is important because it ensures that the material is coherent, appropriate, and applicable for its intended purpose, as well as

free from bias and empirical knowledge, grounded in scientific evidence, thereby allowing for its application in other contexts ¹⁴.

With validation, Educational Technology can be integrated in a complementary manner into the educational process for caregivers, enabling targeted education based on well-structured knowledge with a patient-centered focus. Patient-centered education is only possible through a partnership between healthcare professionals, patients, and caregivers, where a range of information necessary for active participation in care-related decision-making is made available, which is essential for the management of chronic diseases ¹⁵.

In the findings, the judges' considerations and suggestions consistently highlighted the need for information to be tailored to the user, particularly by using less technical language and simplifying terminology, as well as incorporating images for better visualization. Patient-centered education must be the goal of Health Education processes and interventions, fostering autonomy and mastery of care, prioritizing the needs of the population, and clearly and fully ensuring the management of home care ¹⁶.

In this context, the integration of EEs has grown positively by aiming to guide assertive actions in an uncomplicated manner, while also stimulating the development of critical thinking ¹⁷, which guided the proposal to develop the home VMI guidance tool. The development and use of TEs is considered an essential strategy in care practice by bridging theory and practice, given their ability to provide necessary information with scientific rigor, aligned with the use of accessible language ¹⁸. Available in multiple formats, such as posters, brochures, videos, and booklets, they are developed based on research or professional experience and focus on disseminating information and promoting good health practices ¹⁹.

From this perspective, the tool was designed in an accessible and didactic format as an educational booklet, grounded in validated theoretical foundations, ensuring that information is conveyed appropriately and promoting good health practices.

In a well-conducted teaching-learning process, the educator acts as a facilitator, and the learner moves beyond the role of a passive recipient to actively participate, demonstrating understanding and discernment of the necessary health information. In this scenario, the act of teaching, through a guidance tool, involves intentionally intervening by sharing relevant information, with the aim of achieving better health outcomes ⁷.

Given the process of developing and validating health education materials, it is clear that health and education must go hand in hand, through a solid partnership between the educator and the learner. With the validated information contained in the tool, we hope, as active health educators, to provide support for well-guided and scientifically grounded decision-making and daily actions.

As observed in the results of this study, the expert judges identified several weaknesses in the instrument through their suggestions, which were reflected in low IVCs, and such weaknesses could lead to risky behaviors on the part of users when faced with unclear information. It is important to emphasize that education is not limited to the dissemination of health-related information; rather, the educator must foster the motivation, skills, and confidence necessary to improve health, as well as communicate individual risk factors and risky behaviors ²⁰.

It is known that the caregiver plays a prominent role in the care and assistance of children dependent on home

mechanical ventilation; therefore, the use of TEs within health systems seeks to assist and facilitate the caregiver's role, aiming to reduce overload and stress by offering clear and objective guidance ²¹. Thus, after analyzing and interpreting the judges' comments and their impact on the IVCs and Agreement Rates, the instrument aimed to become as clear and accessible as possible through validation, so that the caregiver's work is facilitated by receiving accessible information.

Factors such as low educational attainment, inaccessible language, the distance between professionals and the user, and, above all, the lack of preparation of teams within health systems directly interfere with the education process and the functional health literacy of caregivers ¹⁶. These points highlighted in the literature were also raised by the expert judges in their considerations: reports of low educational attainment among caregivers, emphasis on the overuse of technical and formal terms, and observations regarding the role of health professionals in the development of educational technologies were themes present in the results obtained.

Low levels of functional health literacy are associated with reduced ability to understand, interpret, and use health-related information: this predisposes individuals to greater exposure to risk factors, limited capacity to make informed decisions, increased hospitalization rates, ineffective communication with healthcare professionals, and difficulty understanding guidance provided by health services ¹⁶. Assessing, determining, and intervening in caregivers' health literacy helps improve and plan services, increase user participation in self-management, and enhance public health education ²².

Furthermore, public health services must have effective strategies to optimize communication and health information, adequately preparing

these caregivers to assume their caregiving roles. Given that, as health professionals, we cannot intervene in users' educational background, it is necessary for community health education to also take center stage, by valuing the population's prior knowledge through appropriate, educational, and accessible materials that simplify and strengthen care²³.

Finally, during the content validation process of the instrument, the suggestions and comments from the expert judges regarding improvements and changes, as well as the Word Clouds obtained during the Content Analysis, were critically analyzed and included in the material as applicable. With a satisfactory overall

IVC of 0.95, the educational booklet proved to be clear, understandable, and applicable following the expert judges' evaluation and their contributions, in line with various validation studies that also used the IVC and obtained similar outcomes^{24,21,14}.

The findings of this study highlight that the content validation of guidance instruments is an essential step, as it enables the dissemination of a high-quality, effective resource with high scientific and methodological rigor and, above all, one that is accessible and aligned with the end user.

CONCLUSION

The guidance document titled

“Home Invasive Mechanical Ventilation: Guidance for Families” was considered valid, clear, and relevant in terms of content, with an overall CCI of 0.95 and scores above 0.80 for each topic. Thus, the material may be included in the care transition process, integrated into the hospital discharge routine, highlighting the role of healthcare professionals as active educators. Finally, the next steps for this research include: conducting a pre-test, where the material will be administered to the target audience; followed by psychometric evaluations of the instrument validated by the judges.

REFERENCES

1. Amirnovin R, Aghamohammadi S, Riley C, Woo MS, Del Castillo S. Analysis of a pediatric home mechanical ventilator population. *Respir Care* [Internet]. 2018;63(5):558–64.
2. Forrest CB, Koenigsberg LJ, Eddy Harvey F, Maltenfort MG, Halfon N. Trends in US children's mortality, chronic conditions, obesity, functional status, and symptoms. *JAMA* [Internet]. 2025;334(6):509–16.
3. Manimtim WM, Agarwal A, Alexiou S, Levin JC, Aoyama B, Austin ED, et al. Respiratory outcomes for ventilator-dependent children with bronchopulmonary dysplasia. *Pediatrics* [Internet]. 2023;151(5).
4. Benneyworth BD, Gebremariam A, Clark SJ, Shanley TP, Davis MM. Inpatient health care utilization for children dependent on long-term mechanical ventilation. *Pediatrics* [Internet]. 2011;127(6):e1533–41.
5. World Health Organization. Health promotion glossary of terms 2021. Geneva: WHO; 2021. p. 6.
6. Pinheiro AKC, Viegas R de FP, Lima IB, Rodrigues ILA, Farias SNP de, Nogueira LMV. Letramento funcional em saúde e qualidade de vida de ribeirinhos na atenção primária à saúde. *Rev Lat Am Enfermagem* [Internet]. 2025;33.
7. Brevidelli MM, Moura VPT de, De Domenico EBL. Promoção do letramento em saúde segundo os Health Literacy Universal Precautions Toolkits: Um estudo de reflexão. *Esc Anna Nery* [Internet]. 2024;28(e20240013).
8. Almeida GMF de, Oliveira HH de, Hamamoto Filho PT, Avila MAG de. Letramento em saúde de cuidadores informais de pacientes submetidos à neurocirurgia. *Esc Anna Nery* [Internet]. 2025;29(e20250003).
9. Nunes NGF, Góes FGB, Silva LF da, Silva ACSS da, Goulart M de C e. L, Santos L de A. Vídeo educativo para familiares sobre prevenção e manejo do engasgo em recém-nascidos: elaboração, validação e avaliação. *Esc Anna Nery* [Internet]. 2025;29(e20250004).
10. Andrade JC de, Brito ASF, Santos KAV dos, Dini

- AP, Belasco AGS, Gasparino RC. Construção e validação de uma cartilha educativa multiprofissional para transplantados renais. *Rev Bras Enferm* [Internet]. 2025;78(1).
11. Tomazelli PDZ, Zocche DA de A, Martins T, Artuso AR, Zanatta EA. Website diabetes news em Pauta content validity and appearance. *Texto Contexto Enferm* [Internet]. 2024;33.
12. Coluci MZO, Alexandre NMC, Milani D. Construção de instrumentos de medida na área da saúde. *Cien Saude Colet* [Internet]. 2015;20(3):925–36.
13. Bardin, L. Análise de conteúdo. 1st ed. São Paulo: Edições 70;2015.
14. Lima ACMACC, Bezerra K de C, Sousa DM do N, Rocha J de F, Oriá MOB. Construção e Validação de cartilha para prevenção da transmissão vertical do HIV. *Acta paul enferm* [Internet]. 2017Mar;30(2):181–9.
15. Siddharthan T, Rabin T, Canavan ME, Nassali F, Kirchhoff P, Kalyesubula R, Coca S, Rastegar A, Knauf F. Implementation of Patient-Centered Education for Chronic-Disease Management in Uganda: An Effectiveness Study. *PLoS One*. 2016 Nov 16;11(11):e0166411.
16. Cerqueira PMBC, Silva GM de C, Lima TMSS, Maranhão CBT de O, Teixeira LTA de O, Dantas MAPD, et al. Educação em saúde acerca das doenças crônicas e ao cuidado interdisciplinar. *Revista JRG* [Internet]. 2024;7(15):e151305.
17. Araújo KC, Souza AC de, Silva AD da, Weis AH. Tecnologias educacionais para abordagens de saúde com adolescentes: revisão integrativa. *Acta paul enferm* [Internet]. 2022;35:eAPE003682.
18. Lopes Oliveira DA, Santos Dutra CR, Santos Silva ME, Pereira de Oliveira MR, Queiroz de Lima LJ, Pereira de Lima AS, et al. Tecnologia para educação em saúde na prevenção e rastreamento do câncer de mama. *Nurs (São Paulo)* [Internet]. 2021;24(275):5530–43.
19. Ribeiro ASR, Silva JG da, Ferreira CRS, Pena JL da C, Santos KC, Pena LDS, et al.. CONSTRUÇÃO E VALIDAÇÃO DE TECNOLOGIA EDUCACIONAL SOBRE INSULINOTERAPIA: ESTUDO METODOLÓGICO. *Cogitare Enferm* [Internet]. 2023;28:e85412.
20. Resende JMD de, Oliveira LC de, Aguiar SS de, Silva FP da, Muniz AHR, Bergmann A. Elaboração de uma Cartilha para Prevenção de Fraturas Patológicas em Pacientes com Metástases Ósseas. *Rev Bras Cancerol* [Internet]. 2025;71(4).
21. Moraes AC de SG, Mendes CP, Oliveira KM de, Santana ME de. CONSTRUÇÃO E VALIDAÇÃO DE TECNOLOGIA EDUCACIONAL PARA FAMILIARES CUIDADORES EM CUIDADOS PALIATIVOS ONCOLÓGICOS. *Texto Contexto Enferm* [Internet]. 2025;34(e20240018).
22. Soares TAM, Brasil VV, Moraes KL, Santos LTZ, Vila V da SC, Borges LH Júnior. Letramento em saúde de cuidadores domiciliares de uma capital brasileira. *Acta Paul Enferm* [Internet]. 2021;34.
23. Falkenberg MB, Mendes T de PL, de Moraes EP, de Souza EM. Educação em saúde e educação na saúde: conceitos e implicações para a saúde coletiva. *Cien Saude Colet* [Internet]. 2014;19(3):847–52.
24. Sabino LMM de, Ferreira ÁMV, Joventino ES, Lima FET, Penha JC da, Lima KF, et al.. Elaboração e validação de cartilha para prevenção da diarreia infantil. *Acta paul enferm* [Internet]. 2018May;31(3):233–9.