

EDUCATIONAL TECHNOLOGY ABOUT LIVING BETTER WITH CARDIAC INSUFFICIENCY: VALIDATION STUDY

Tecnologia educacional sobre viver melhor com insuficiência cardíaca: estudo de validação

Tecnología educacional sobre vivir mejor con insuficiencia cardíaca: estudio de validación

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ABSTRACT

Objective: construct and validate an educational technology to mediate the educational action of nurses with patients and their families at hospital discharge. **Method:** methodological development research, with content validation. Data collected from June to August 2017. The research developed in three phases: production, evaluation, adequacy. The population was 24 judges among health professionals and other areas. The judges answered a questionnaire with 3 blocks of evaluative items. **Results:** of the 22 items of the questionnaire of the judges of the health area only two obtained score I (inadequate). The validated technology was considered, since according to the literature it is necessary to obtain a content validation index of at least 70%, and the index obtained was of 91.1%. Based on the suggestions was made the adequacy of the technology. **Conclusion:** the technology produced was validated and with the adequacy if it constitutes an adequate device to mediate the educational action of the nurse.

Descriptors: Health education; Cardiac; Insufficiency; Nursing; Educational technology; Validation studies. Resumo

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RESUMO

Objetivo: construir e validar uma tecnologia educacional para mediar o agir educativo do enfermeiro com pacientes e familiares na alta hospitalar. **Método:** pesquisa de desenvolvimento metodológico, com validação de conteúdo. Dados coletados de junho a agosto de 2017. A pesquisa desenvolvida em três fases: produção, avaliação, adequação. A população foi de 24 juízes entre profissionais da saúde e de outras áreas. Os juízes responderam um questionário com 3 blocos de itens avaliativos. **Resultados:** dos 22 itens do questionário dos juízes da área da saúde apenas dois obtiveram escore I (inadequado). Considerou-se a tecnologia validada, pois segundo a literatura deve-se obter um índice de validação de conteúdo mínimo de 70%, e o índice obtido foi de 91,1 %. Com base nas sugestões realizou-se a adequação da tecnologia. **Conclusão:** a tecnologia produzida foi validada e com a adequação se constituiu um dispositivo adequado para mediar o agir educativo do enfermeiro.

Descritores: Educação em saúde; Insuficiência cardíaca; Enfermagem; Tecnologia educacional; Estudos de validação.

RESUMEN

Objetivo: construir y validar una tecnología educativa para mediar el actuar educativo del enfermero con pacientes y familiares en el alta hospitalaria. **Método:** investigación de desarrollo metodológico, con validación de contenido. Datos recolectados de junio a agosto de 2017. La investigación desarrollada en tres fases: producción, evaluación, adecuación. La población fue de 24 jueces entre profesionales de la salud y de otras áreas. Los jueces respondieron un cuestionario con 3 bloques de ítems de evaluación. **Resultados:** de los 22 ítems del cuestionario de los jueces del área de la salud sólo dos obtuvieron escore I (inadecuado). Se consideró la tecnología validada, pues según la literatura se debe obtener un índice de validación de contenido mínimo del 70%, y el índice obtenido fue del 91,1%. Con base en las sugerencias se realizó la adecuación de la tecnología. **Conclusión:** la tecnología producida fue validada y con la adecuación si constituye un dispositivo adecuado para mediar el actuar educativo del enfermero.

Descriptorios: Educación en salud; Insuficiencia cardíaca; Enfermería; Tecnología educativa; Estudios de validación.

INTRODUCTION

Cardiac Insufficiency (CI) is a clinical syndrome resulting from a functional or structural cardiac disorder that impairs the ventricle's ability to fill with or eject sufficient blood according to the body's demand, or even allows it to do so only under higher filling pressures.¹

Nowadays, CI is one of the main public health problems worldwide, because of its high prevalence, the great impact on morbidity and the high cost that it entails for the health system; it is the common final pathway of most heart disease, being one of the most important current clinical challenges in the health area. CI is an epidemic issue that is still in progress.^{2,3}

The stratification of patients with CI is a simple measure, based on historical data, and allows the health professional to evaluate the evolutionary moment of the disease in which the patient is to evaluate the quality of life and prognosis and establish priorities and therapeutic guidelines.³

This form of categorization allows an evolutionary understanding of the disease and also serves as a basis for

the identification of patients with indication of predominantly preventive interventions (stages A and B), therapeutic (stages C) or selection of patients for specialized procedures and palliative care (stage D).³

The process of caring for patients bearing cardiac insufficiency permeates the identification and understanding of the responses those patients towards real and potential health problems, facilitating the choice of nursing interventions. Hence, it stimulates pharmacological and non-pharmacological measures that aim to improve the quality of life and adherence to treatment through health education.⁴

Accordingly, health education is important to avoid future hospitalization. It is necessary to educate the patient and family member at the moment of hospital discharge. Patients should act in collaboration with health professionals to maximize this benefit.²

Nonetheless, nurses' participation in educational actions is important through the development and use of strategies and technologies for health education in the management of symptoms and self-care directed at patients and their families, aiming to provide a better quality of life to them.⁵

It should be underlined that the purpose of health education is to teach patients to better cope with the various situations caused by the worsening of the heart condition during the course of CI, thus enabling a better quality of life.⁵

Regarding the therapeutic regimen, the use of educational strategies implemented by nurses to improve the knowledge of patients with CI on the disease, treatment, and adherence to treatment can have a positive effect, since we can see that several self-care recommendations were associated with better rates and fewer hospitalizations for all causes.⁶

So, the guidelines given by the nurse at the time of hospital discharge can elucidate many questions about the health-disease process which will help the patient to live better with the disease contributing to the improvement in the quality of life and prevention of possible complications that can lead to readmissions.⁷

Technology can be considered as the apprehension and application of a set of knowledge and assumptions that provide individuals to think, ponder, act, making the subjects of their own process of existence. Considering this viewpoint, technology needs to be based on a specific practical reality, in other words, it will have its existence meaningful as it has been conceived from the demands of people's daily practices.⁸

Therefore, nursing can count on a set of technologies that can be increasingly developed and specialized by all those professionals motivated to an improvement of the health care of the human being. Thus, it is necessary for nurses to seek the construction of their own knowledge, a knowledge that is related to the quality of life, how to administer health, illness and the problems that result from it.⁹

Bearing this perspective in mind, it is a challenge to promote/adapt the insertion of technologies in health practice, so that they contemplate the social needs of the population since it is expected that, in health, the production of goods/

relationships takes priority and that such technologies should favor it.¹⁰

Taking as its starting point the elaborated Educational Technology (ET), this research starts with the following question: What is the validity index of a printed educational technology guidebook on living well bearing cardiac insufficiency according to judges and targeted public?

The study's goal is to build and validate the content of a printed educational technology guidebook on living better with cardiac insufficiency, aiming to mediate the nurses' educational approach towards the patients and their families during hospital discharge.

METHODS

It is a research-type study of methodological development. This type of study is characterized by investigating, organizing and analyzing data to construct, validate and evaluate instruments and research techniques, focused on the development of specific tools to improve the reliability and validity of these instruments and techniques.¹¹

This study was carried out from March 2016 to October 2017, focusing on the validation of the content of educational technology, produced by the author, in a guidebook format, to mediate the educational action of nurses with patients living with CI and their relatives at the time of hospital discharge. The research was developed in three phases: production, evaluation, adequacy.

Phase 1: Production of educational technology. The production of version 1 was carried out based on the selection of contents considered relevant and adequate to mediate the educational action of nurses at discharge from patients with CI and their relatives. The contents were identified in the literature review. After the reading and the selection of the contents, the technology was produced by typing and illustration of a guidebook in the printed format. All images were obtained by electronic means.

Phase 2: Evaluation of the guidebook. The evaluation of version 1 was carried out by expert judges, from the health area and other areas. Inclusion criteria were: For health experts: to have experience with the care/care of people living with CI (theme on focus) for at least 1 year; and/or have a specialization in cardiology; and/or have a publication related to the subject-focus; and/or have conducted/oriented research related to the subject-focus. For judges-specialists in other areas: have experience with educational technologies for at least 1 year (teaching, research, extension); and/or have specialization related to ET; and/or have publication related to ET; and/or have conducted/oriented research related to ET.

An instrument becomes validated when multiple measures are employed to answer a single research question. In this regard, researchers should calculate the concordance index, which indicates to what extent the expert judges' opinions/suggestions/recommendations are appropriate. The default agreement value to establish the excellence

of content validity you are measuring can range from 70 to 100%.¹²

The greater the number of convergence of results, after the use of several techniques, provides greater reliability and validity in the results of the study.¹²

The validation process was performed at different locations (according to the location of participants), with the main site being the cardiology units of a university hospital located in the *Rio de Janeiro* city, Brazil.

The judges-experts were invited by verbal and face-to-face contact and also by electronic mail (via e-mail). After the agreement, they completed the informed consent form. Immediately afterwards, they received a printed copy of the notebook guide and a copy of the respective instrument. They were asked to return the completed instrument and guidebook within a week.

Two models of data collection instruments were used, one for health experts and another for judges from other areas. The two instruments have been used in other validation studies.¹³

The health judges' questionnaire is organized into four parts: identification, instructions, blocks of questions, general comments and suggestions. The blocks of questions were 4: a) objectives (items 1.1 to 1.5); b) structure and presentation (items 2.1 to 2.11); c) relevance (items 3.1 to 3.5). The Likert Scale was composed of the following items: 1 - Totally Adequate (TA); 2- Adequate (A); 3- Partially Adequate (PA); 4- Inadequate (I).

The questionnaire of the judges from other areas is organized into four parts: identification, instructions, blocks of questions, general comments and suggestions. The blocks of questions were 5: a) content (items 1.1 to 1.3); b) language (items 2.1 to 2.3); c) graphic illustrations (items 3.1 and 3.2); d) motivation (items 4.1 to 4.3); e) cultural adequacy (items 5.1 and 5.2). The Likert Scale was composed of the following items: 2-Adequate (A), 1- Partly Adequate (PA), 0- Inadequate (I).

This instrument for judges from other areas, with emphasis on design and marketing mainly, was elaborated based on an American instrument proposed in 1996 to assess the difficulty and convenience of educational materials, called Suitability Assessment of Materials (SAM). In the SAM instrument, there is a list to check attributes related to content, writing style, appearance, motivation and cultural appropriateness of the educational material.¹³

For the validation of the technology by the health judges, the item and the grand total should have a Content Validity Index (CVI) of 0.70 (70%). The CVI measures the proportion of judges in agreement on a certain aspect of the instrument. This calculation was possible because we used a Likert scale with scores of one to four. The index is calculated by means of the sum of agreement of the items marked "1" and "2" by the experts, divided by the total answers. We use the following formula for the calculation of CVI.¹⁴

$$CVI = \frac{\text{Number of answers 3 and 4}}{\text{Total number of answers}}$$

For the evaluation of the suitability of the technology by the judges of other areas, the SAM Score was obtained. The SAM Score is calculated from the sum of points obtained on the instrument by each judge. To be considered appropriate, the technology must obtain a score of 10 points or higher.¹⁴

Phase 3: Adequacy of educational technology: The adequacy of the guidebook was performed after analyzing the items evaluated by the judges as well as reading the suggestions presented by them. Modifications were made both in the text and images, which resulted in version 2 of the technology.

According to the ethical-legal precepts addressed on the Resolution No. 466/2012, this research was assessed by the Research Ethics Committee from the *Hospital Universitário Pedro Ernesto (HUPE/UERJ)* being approved under the Legal Opinion No. 2.073.043.

RESULTS

The results will be presented in three topics, specifically: description of the educational technology, validation (profile of participants, validation of judges from the health area and judges from other areas) and adequacy.

Description of the Educational Technology

The version 1 of the technology submitted to the validation of the judges contained 19 pages, printed on white sheets with multiple colors in the contents, on the legal paper A4 mm 210 x 297, per file folder. The title chosen for the booklet was: To live well bearing cardiac insufficiency.

The content of the guidebook contains an introductory presentation and then the summary, containing the following subjects presented in the form of topics: What is cardiac insufficiency? What are the causes of cardiac insufficiency? How to live better with cardiac insufficiency? Strict control of liquids. Attention. Tips. Quit smoking. Do not drink alcohol. Practice physical activity. Medication adherence. Stay alert. Do not get out of this. Maintaining the quality of life. Table. Schedule of medications. Final considerations and references.

For the illustration of the technology were used numerous figures on: Why does the heart grow bigger? What is cardiac insufficiency? Factors associated with various diseases such as: hypertension, chronic arterial disease, acute myocardial infarction, obesity, reasons for hospital readmission, weights and measures, healthy eating, sodium consumption, alcoholism, and smoking. Considerations were taken into production aspects to make technology more attractive, easy to read and to handle, informative and objective.

Validating the educational technology

Content validation - Health judges: the participating judges from the health area: 16 nurses, 1 cardiologist, 1 occupational therapist, 1 physiotherapist, and 2 nutritionists, comprising a final sample of 21 professionals. As for the time of training, of the 21 judges, 8 are formed of 2-10 years (38.09%), 4 of 11-15 years (19.05%), 2 of 16-20 years (9.52%),

and 7 with more than 21 years (33.34%). Regarding the area and time of performance, the 21 (100%) judges work in the cardiovascular unit, the shortest time being 2 years and the highest is 30 years. These data confirm the professional experience of the judges in cardiology, ensuring evaluation of the guidebook based on the experience.

BLOCK 1: Objectives. This block is related to the target to be reached using the guidebook. In the evaluation of the responses of this block, 59 (56.2%) scored for TA, 37 (35.2%) for A, 7 (6.7%) for PA and 2 (1.9%) for I. According to the response options, the TA and A scores add up to 96 (91.4%), which corresponds to CVI in this block; the lowest CVI among the items was (0.85%) and the highest (0.95%).

BLOCK 2: Structure and presentation - refers to how to present the guidelines to the targeted audience, their organization, structure, consistency, and formatting. In this respect, the answers of the judges were: 144 (70.9%) for TA, 41 (20.2%) for A, 18 (8.9%) for PA and 0 (0%) for I. Considering the 203 (100%) answers obtained from the sum of all the items in this block, 185 (91.1%) conferred to TA and A. The concordance index in this block obtained the lowest average obtained 0.76, however, most of the averages exceeded that expected.

BLOCK 3: Relevance - these are the characteristics that determine the degree of significance of the guidebook. The responses were as follows: 67 (63.8%) for TA, 28 (26.7%) for A, 10 (9.5%) for PA and 0 (0%) for I, therefore, from 105 (100 %) response options all items of this block, estimated 95 (90.5%) for TA and A. For this block the lowest averages was 0.85, giving a concordance index above the average of (80%).

The sum of all TA scores resulted in a total of 270 and for A total of 106, this confirms the propensity for concordant responses between the judges for TA (65.4%) and A (25.7%). Of the 22 items of the questionnaire represented in the three tables only two obtained score I (inadequate). Considering that to be validated, the technology must obtain a minimum CVI of (70%), and the general CVI obtained was of (91.1%), the technology was validated.

Content validation - Judges from other areas: Judges from other areas participated in 2 educational pedagogues (Judges 1 and 2) and 1 hospital educator (Judge 3), reaching a final sample of 3. Concerning the judges, all are adults, within the age group from 29 to 54 years old, training time of at least 4 years and a maximum of 30 years. Regarding the time of performance, the shortest time is 4 years and the longest 30 years. As for teaching, it is on point for most judges.

The sum of points obtained in the instrument by each judge allowed to verify that the SAM score from the judge 1 was 26, from the judge 2 was 24, from the judge 3 was 18. Considering that to be adequate, the technology must obtain a score equal to or greater than 10 points, and the score of judges 26, 24 and 18, the technology was considered adequate.

Adequacy of the educational technology

Numerous suggestions were obtained from all judges (from health and other areas), as illustrated in **Chart 1**.

Chart 1 – Specialist judges' suggestions for the guidebook.

Merging images with information	Weight: Communicating sudden weight gain
Approaching the topic more succinctly and with simplified language	Talking about nausea/vomiting/inappetence due to swelling and fluid accumulation in the digestive tract.
Explaining why the heart grows bigger	Changing the term dyspnea by difficulties to breathing
Clarifying what is lean meat	Reducing the number of pages
Tips to improve thirst sensation	Reducing the text and increasing the information.

Elaborated by the authors.

After the analysis of the suggestions, the suitability of the technology was done, and thus, the guidebook version 2 was obtained. The version 2 of the technology contains 29 pages, printed on white sheets with multiple colors in the contents, on the legal paper A4 mm 210 x 297, fastened by file folder. The final title: "Living better with cardiac insufficiency".

The content of the guidebook was more pleasant and had a simpler language when compared to version 1, then being easier to understand by the targeted audience.

DISCUSSION

It is known that educational technologies are necessary and relevant because they are able to provide information that improves the patient's knowledge and coping, especially with chronic illness, making the client able to understand how their actions influence their health patterns.¹⁴ The guidebook emerged from professional experience, in which a high rate of hospital re-admission due to decompensation of the disease was observed in a cardiology units department of a university hospital located in the *Rio de Janeiro* city, Brazil.

As we seek to improve the quality of care in order to minimize the negative impact of CI, it becomes essential to use instruments capable of adequately measuring this quality. For these reasons, several initiatives to evaluate and improve patient care with CI began to be developed.²

The Heart Failure Society of America recognizes the importance of health education and recommends that patients receive educational material as part of their discharge instructions. The Joint Commission also recommends that patients with CI should receive written discharge instructions and be based on parameters or guidelines.¹⁵

The methodology used was able to subsidize the elaboration of an attractive and comprehensive educational technology, which may facilitate the elaboration of other educational technologies, both in this theme and in any other one, that involves the need for care.¹⁴

Therefore, the process of health education for patients bearing CI becomes an important tool for the teaching and learning of care aimed at the control of CI. The use of this teaching instrument can help these individuals to adapt better to the symptoms of CI, avoiding complications, as well as performing prescribed therapy and solving problems when faced with new situations.⁵

In regards to the validation, it is worth noting that judges contributed with the quality of the technology, and with its use, it can contribute with the quality of care to this clientele and their relatives, which will need to be evaluated by professionals. Validate is related to the measurement properties of an instrument. Not being characterized in a simple task, but of extreme importance, since the scientific recognition of the instrument is given through the accomplishment of validation studies.¹⁶

The observations of the judges express enthusiasm for the attitude and the possibility of being inserted the patient and his relatives in the caring process. Therefore, the positive agreement among the judges exceeded expectations. Among health professionals involved in the use of educational actions, nurses are constantly challenged to seek options that support them to work with people, groups, and communities, and educational technologies are strong allies in this process.¹⁴

The Ministry of Health recommends that the production of a didactic material needs to be careful in relation to the language of its texts, aimed at the targeted audience. The language must be clear, objective and colloquial, adequate to the characteristics of the clientele. This allows for a light and pleasant reading, easy to understand.¹⁷

FINAL CONSIDERATIONS

Herein, we have concluded that the proposed objectives were achieved, in other words, the construction of a technology and then the validation process of the guidebook titled "Educational technology on living better with cardiac insufficiency: a validation study" aimed at mediating the nurses' educational approach towards the patients at hospital discharge.

The participation of judges from the health area contributed from their experiences and specialization in the area of cardiology, pointing out the relevance of the topic addressed since cardiac insufficiency is pointed out as an important public health problem in world progression.

The participation of judges from other areas have collaborated towards the adequacy of the educational part, appearance, and spelling correction regarding the organization in the technology validation process.

The production of educational technology is a breakthrough for health education activities for patients bearing cardiac insufficiency and their families and can mediate the nurses' educational activities towards the patients and family members. Hospital readmission should be reduced due to disease decompensation, and the guidebook can be a

highly effective tool to help patients and families alleviate their doubts, but to replace the educational action and evaluation of the professional team.

As a limitation of the study, it is possible to address the non-accomplishment of the technology validation with the targeted public. Nevertheless, it is intended to be carried out in a future work.

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