

Educational technology to guide the organ donation process: a validation study

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Abstract

This research aims to elaborate and validate a comic book that should be used to mediate the knowledge of the population about the process of organ and tissue donation. It is a validation study of an educational technology, for which 15 judges participated among health professionals and other areas. These judges answered three sets of questions, consisting of 22 questions, based on the Likert scale. For the analysis of the answers, we use a technique known as Delphi that is based on a methodology with the purpose of directing and comparing the judgments of experts in a given event. Data from this quantitative study were collected between January and October 2017 at the Center for Notification, Collection and Distribution of Organs and Tissues (CNCDO), installed in the Metropolitan Hospital of Emergency and Emergency (HMUE) in the north of Brazil. The judges judged the subjects related to the objectives, structure and organization and relevance of the educational technology, the results were favorable to the validation of the comics, since the percentages of agreement were superior to the required minimum of 80%, being between 93% and 100%. Therefore, the comic is a statistically valid instrument to be used among the population, according to the answers of the expert judges. In view of this, we have identified that this technology is valid to educate the population about the importance of donating organs and tissues, since comics are part of the daily life of many generations in Brazil and in the world, this fact generates interest of the population to read and to practice the information contained in this technology. The perspective, therefore, is that the technology makes it possible to provide efficient educational information, contributing to the construction of a new donation culture. In addition, we hope to contribute to this technology being used by many education and health professionals in order to improve donation rates in Brazil and worldwide.

Keywords: Nursing, Health Technologies, Health Education, Tissue and Organ Procurement

INTRODUCTION

Studies point to Brazil as the second country that transplants most annually, and 90% of these transplants are performed through its public health system (Costa, Costa and Aguiar, 2016). This process is characterized by the total or partial withdrawal of a physical structure as organ or tissue and subsequent implantation in the same or another patient aiming to treat or cure it (Santos, Costa and Nogueira, 2018). Transplantation is the last therapeutic option for patients with acute or chronic serious diseases, capable of reversing several pathological conditions and improving the patient's quality of life (Araújo and Massarollo, 2014).

In Brazil, between 2010 and 2017, the effective donor rate increased significantly to 69.9%, from 9.9 per million people (PMP) to 16.7 PMP. As for the rate of potential donors, in the same period, there was an increase of 41% and donation effectiveness increased by 21%. Only in 2017 did the number of effective donors increase from 14% to 16.6% and the donation rate increased by 32.4%. However, in 2018, there was modest growth compared to real donors, which was only 2.4%, showing a fall of 5.5% compared to that expected for that year (Registro Brasileiro de Transplantes, 2018).

For organ transplants to continue growing in Brazil, it is essential to improve the four pillars that underpin the donation process: legislation, funding, organization and education (Pompeu *et al.*, 2014). In this sense, education is essential, as there is still a grand refusal of family members that represent an obstacle to the accomplishment of transplants. In this context, lack of knowledge and inadequate guidance on the organ and tissue donation process are the main factors of family refusal (Rosário *et al.*, 2013).

Families who correctly understand the meaning of brain death are more likely to authorize organ donation when compared to families who believe that the patient may still return to survival because of the preservation of temperature and cardiorespiratory functions. Expressing, therefore, greater difficulty in accepting the death of the loved one. In this case, the process of capturing and distributing organs and tissues in an ethical, moral and legal way, as well as the education of the population, must be carried out, since it is fundamental to sensitize people to organ donation (Costa, Costa and Aguiar, 2016).

As a method to reduce the refusal of family members at the moment of authorization for the capture and implantation of organs and tissues, we have the educational technologies, instruments facilitating the teaching-learning process used as a means of knowledge transfer, providing individuals with participation in a moment of exchange of experiences that leads to the improvement of skills (Afio *et al.*, 2014). For this, the technology can be used in print format, such as comic books, which appears in this problem as a means of mediate knowledge and clarify doubts about the process of organ donation.

In this context, the objective was to elaborate and validate a comic book that should be used to mediate the knowledge of the population about the process of organ and tissue donation.

METHOD

1.1 Study Design

A quantitative study that validates an educational technology. The study site was the Center for Notification, Collection and Distribution of Organs and Tissues (CNCDO), installed in the Metropolitan Hospital of Emergency and Emergency (HMUE) in the north of Brazil.

The work took place between January and October 2017 and had its data collection divided into five moments. The first moment was directed to the search and data collection on the proposed topic, later the study passed the ethics committee for evaluation and approval to elaborate the research, in the third stage, the technology was presented to 15 expert judges (5 nurses, 4 doctors, 1 psychologist, 1 social worker, 1 pedagogue, 1 graphic designer, 1 art educator and 1 social communicator) for the evaluation. At that moment, the invitation to participate in the study was given, the Term of Free and Informed Consent, which confirms its acceptance in the research, and the Likert scale - a data collection instrument used by the judges to measure the agreement of the peers with the object of study, being composed of three blocks containing evaluative items referring to the content of the didactic material. In addition, the fourth and fifth moments were for the analysis of data obtained and suggestions from the expert judges and for the final preparation of Educational Technology, respectively.

1.2 Data Analysis

The study used a technique known as Delphi that is based on a group methodology, with the intention of directing a judgment based on the comparison of the specialists, in order to assign convergences and divergences within a question, aiming to establish a parameter for the construction of an opinion (Marques and Freitas, 2018).

Subsequently, the adequacy of the behavioral representation of the items was calculated, in which it was judged whether they were referring to the characteristic in question. The analysis of this adequacy is a product of the calculated statistic, that is, the arithmetic means of the scores of the item analyzed by the judges (Nascimento and Teixeira, 2018). For the correct analysis, the possible responses were grouped: Totally Adequate (TA); Suitable (A); Partially Appropriate (PA) e; Inadequate (I). The TA and A were considered positive responses and received a score (+1), P received a rating (zero) and I, a negative response and a score (-1). The more the judges' responses were positive, the greater the agreement on the validation of the technology. After the capture of all the answers, the arithmetic average that varied between -1 and +1 was calculated. For the effectiveness of the validation, it was expected that the results of the averages were positive and above 80%. If the averages obtained were lower than the expected results, adjustments would be made.

1.3 Data Collection and Consent

The study was approved by the Ethics Committee within the regulatory norms of research involving human beings, by resolutions 466/12 and 510/16 of the CNS / CONEP, with the opinion n° 2.227.373 and as CAAE n° 71098717.0.0000.5550.

RESULTS

Table 1 expresses the answers of the judges according to the objectives. This block refers to the purposes and aims to be achieved with the use of the comic book. The results indicate a high percentage of TA and A, 37 (49.33%) and 34 (45.33%) respectively, followed by the AP with 4 (5.33%) and I with 0 (0%). It can be said, therefore, that most expert judges believe that the concept of comics is adequate to achieve what is proposed. Besides, for the concordance index in this block, the highest mean obtained was 0.100, and the lowest was 0.86, given the proposed index.

Table 1: Answers obtained from the expert judges according to the objectives. Belem, Para, 2017.

Items	Scores (N = 15) Score x100/TA+A+PA= Percentage by score				Index of agreement by item TA+Ax100 Total judges
	TA	A	PA	I	
Block 1: Objectives					
1.1 The information/content is consistent with the information needs of the population on organ and tissue donation.	7	8	0	0	0,100
1.2 The information/content is relevant to mediate the population's knowledge about organ and tissue donation.	7	7	1	0	0,93
1.3 It prompts the search for information and changes in the face of an adverse action on the donation of organs and tissues.	7	6	2	0	0,86
1.4 It can circulate in civil society.	9	6	0	0	0,100
1.5 It meets the objectives of the institutions involved in donating organs and tissues.	7	7	1	0	0,93
Punctuation by block	37	34	4	0	
Total percentages	49,34%	45,33%	5,33%	0,0%	
Percentage of approval	94,67%				

Scores: TA = Totally adequate, A = Adequate, PA = Partially adequate, I = Inadequate

Regarding block 2, which describes the structure and presentation of Educational Technology, such as writing, guidelines, cohesion and coherence, formatting and presentation strategy, the expert judges described their responses as follows: 84 (46.67%) answered TA, 86 (47.78%) opted for A, 10 (5.55%) for PA and 0 (0%) for I. In addition, the agreement index in this block obtained the highest and the lowest mean of 0.100 and 0.86, respectively.

Table 2: Answers obtained from specialist judges according to structure and organization. Belem, Para, 2017.

Items	Scores (N = 15) Score x100/TA+A+PA= Percentage by score				Index of agreement by item TA+Ax100 Total judges
	TA	A	PA	I	
Block 2: Structure and organization					
2.1. The comic book is suitable for the adult/young audience.	7	8	0	0	0,100
2.2 The messages are presented in a clear and objective way.	6	7	2	0	0,86
2.3 The information presented is scientifically correct.	9	6	0	0	0,100
2.4 The material is socio-culturally appropriate for the adult/young audience.	4	10	1	0	0,93
2.5 There is a logical sequence of proposed content.	4	10	1	0	0,93
2.6 The information is well structured according to the spelling.	8	5	2	0	0,86
2.7 The writing style corresponds to the knowledge level of the adult/young audience.	5	9	1	0	0,93
2.8 The information on the cover, back cover, abstract, thank you and/or presentation is consistent.	9	5	1	0	0,93
2.9 The size of the title and topics is adequate.	8	6	1	0	0,93
2.10 The illustrations are expressive and sufficient.	7	7	1	0	0,93

2.11 The material (paper/print) is appropriate.	9	6	0	0	0,100
2.12 The number of pages is adequate.	8	7	0	0	0,100
Punctuation by block	84	86	10	0	
Total percentages	46,67%	47,78%	5,55%	0,0%	
Percentage of approval	94,44%				

Scores: TA = Totally adequate, A = Adequate, PA = Partially adequate, I = Inadequate

In the third block, we aimed to identify the characteristics and degree of significance of the comic book, with the following percentages: 49.33% for TA (37), 42.57% for A (32), 8% for PA (6) and 0% for I (0). Thus, in relation to the responses of the items in this block, 69 (92%) represent the sum of TA and A, proving that the comic is valid as to its relevance. In addition, the agreement index has the highest average of 0.100 and the lowest of 0.80.

Table 3: Answers obtained from expert judges according to relevance. Belem, Para, 2017.

Items	Scores (N = 15) Score x100/TA+A+PA= Percentage by score				Index of agreement by item TA+A x100 Total judges
	TA	A	PA	I	
Block 3: Relevance					
3.1 The themes portray the main aspects that need to be strengthened.	10	5	0	0	0,100
3.2 The material allows the transfer and generalization of learning to different contexts (from primary care to hospital level, beyond schools and other places).	7	5	3	0	0,80
3.3 The comic book proposes the construction of knowledge.	8	6	1	0	0,93
3.4 The material addresses the subjects necessary for the knowledge of the population about the process of donation of organs and tissues.	7	8	0	0	0,100
3.5 The comic book is suitable for adults / young audiences.	5	8	2	0	0,86
Punctuation by block	37	32	6	0	
Total percentages	49,33%	42,67%	8,0%		
Percentage of approval	92%				

Scores: TA = Totally adequate, A = Adequate, PA = Partially adequate, I = Inadequate

The sum of all TA scores resulted in a total of 158 and, for A, a total of 152. This confirms that the concordant responses between the judges for TA and A were optimal. Of the 22 items of the questionnaire represented in the three validation tables, none scored I, characterizing agreement among the judges in relation to the evaluated items. In addition, the results of all items of the three tables show the superiority for TA and A, and the percentages of agreement between the blocks presented values from 93% to 100%, confirming that the comics reached a degree enough for validation.

The expert-validated educational technology is an illustrated comic, with verbal and non-verbal images, speeches of characters and narrators, and the presence of onomatopoeia, produced by the authors of this article.

The comic has 13 pages. In the pretext, one has: cover illustrated with the title "Heroes Anonymous: the power is within you"; on the back cover is the presentation of the comic magazine that expresses statistical data on the donation of organs and tissues of the Brazilian Association of Organ Transplants. Also, on the back cover, the text seeks to sensitize the reader about the importance of being a donor, comparing it to a superhero. Throughout the rest of the pages, the trajectory of five heroes who compare their actions and superpowers to the attitudes of normal citizens who donate organs and tissues and health professionals working to capture and perform these transplants is told. In addition, the story informs the reader about the types of donors and organs and tissues that can be donated. There is also a warning about organ marketing and the location that a prospective donor and their family members need to go to complete this process safely. The following figures demonstrate some aspects of the technology in question:



Source: Personal Collection, Belem, Para, 2017.

Figure 1: Cover (left) and page 1 (right) of the dialogues, presentation of the heroes. Belem, Para, 2017.



Source: Personal Collection, Belem, Para, 2017.

Figure 2: Page 2 (left) performing a transplant, page 5 (right) potential donor and dialogue on organs that are transplanted. Belem, Para, 2017.



Source: Personal Collection, Belem, Para, 2017.

Figure 3: Page 9 (left) dialogue with relatives about organ and tissue donation, final page (right) the heroes leaving the hospital after a day's work. Belem, Para, 2017.

DISCUSSION

Considering the result, for the first block, shown in table 1, the agreement between the judges, regarding the comic book objective, was satisfactory for the objective to be achieved, in this case, to educate and sensitize the target audience as to the importance of becoming an organ and tissue donor. Thus, this technology is adequate for the target item of validation, once the approval rate was higher than 80%, reaching, therefore, the proposal of this study.

Comic books are technologies that can present educational purposes through moments of fun and learning when incorporated into the health environment, can present great results for health education. The process of construction of this technology allows, through the textual and imaginary elements, to incorporate scientific aspects synthesized in a didactic way, appropriate to the public that one intends to reach, converting its content into useful information. In addition, it serves to represent and preserve the culture of a population, allowing the creation and recreation of the world, life and science (Partelli and Cabral, 2017).

The second block, referring to the structure and presentation of the comic, was the component that presented the greatest difficulties during the construction process, considering the lack of agreement between the authors in points such as: layout, paper type, suitable color for content and language settings. Despite these difficulties, this block showed acceptance of 94.44%, which corresponds to most responses as totally adequate and adequate, in addition, none of the topics in this block was judged as inadequate, a fact that confirms the acceptance of the technology. The judges pointed out some orthographic deviations, which were corrected, and judged the comics as suitable to be applied.

Each item of the validation process of an instrument presents an indispensable value for the construction of the desired material. For this, it is necessary the specialized appreciation of the subject, which has the function of correcting, adding, modifying and suggesting information pertinent to the instrument so that the material is appropriate to the target audience. However, the success of technology must be fully integrated with the social images of its audience, so that its purpose can be effectively achieved. For this to happen, we chose to make the comic book, since visual acuity is a communication vehicle capable of influencing the moral, social and ethical values of a society (Nascimento and Teixeira, 2018).

In the third block, it was confirmed that the comic is valid as regards relevance when presenting acceptance of 92% for totally adequate and adequate. The comments of the judge's express satisfaction, as the technology, strongly encourages the process of donation of organs and tissues among citizens, especially the population contained in the scenario of this research. In general, this technology is a significant advance for academic and scientific society, since all areas related to health or education can use the comic book as a method to increase the rates of donations in Brazil in the world.

Because of this, it is suggested that this technology be disseminated among the academic and scientific community, for all professionals related to health and education institutions. With this, it is emphasized that the use of educational technology as a tool is useful in health education activities. Therefore, the validation of this comic book tends to offer innovation in the communication process between the health team and society in diverse environments, to effectively teach potential donors and family members about the importance and methods of organ and tissue donation. It also positively convinces family members to authorize the donation of organs from their loved ones, since this attitude can guarantee survival to other citizens.

CONCLUSION

The results show that the comic is a statistically valid instrument, as it reached a degree of agreement higher than the one recommended in the literature. Thus, in the verification of the validation of the technology, the constructed comic was considered adequate to mediate the orientation on the process of donation of organs and tissues for transplantation, according to the evaluation of expert judges; there was an understanding of the instrument as valid for use with the population, supported by study participants.

The objective of validating an educational technology such as comics to mediate the orientation of the population in the donation of organs and tissues for transplantation was reached. With this, it was observed that the comic book is a statistically valid instrument to be used with the population according to the expert judges. The perspective, in this sense, is that this technology can educate the population and build humanitarian sentiments capable of sensitizing them to the donation process, favoring a new culture in favor of donation and, consequently, positive data about donor families and the waiting ready for a transplant. Health education, therefore, is necessary in all scenarios, and educational technologies are great supports for the teaching-learning process.

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