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RESEARCH

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Validation of educational game for adolescents about the sexuality topic

Validação de jogo educativo sobre sexualidade para adolescentes

Validación de juego educativo sobre sexualidad para adolescentes

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ABSTRACT

Objective: The study's goal has been to validate an educational game for adolescents about the sexuality topic. **Methods:** It is a methodological study of content and appearance validation by sixteen expert judges selected by convenience in accordance with the criteria adapted from Fehring. The Content Validity Index (CVI), exact binomial distribution test and Cronbach's alpha coefficient were calculated based on the survey answers. The Research Ethics Committee of the *Faculdade Metropolitana da Grande Fortaleza* approved the study under the *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appreciation] No. 32613514.2.0000.5618. **Results:** The evaluation presented CVI of 0.93, appearance agreement of 93%, thus characterizing the game as a valid tool. The total game Cronbach's Alpha coefficient was 0.88, then constituting a good internal consistency in the judges' responses. **Conclusion:** The final material has been validated and can be used in educational practices on the sexuality topic with the target audience.

Keywords: Sexuality, Educational Technology, Adolescent.

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RESUMO

Objetivo: Validar jogo educativo sobre sexualidade para adolescentes.

Métodos: Estudo metodológico de validação de conteúdo e aparência por dezesseis juízes especialistas selecionados por conveniência de acordo com os critérios de Fehring adaptados. Calculou-se o Índice de Validade de Conteúdo (IVC) e o teste exato de distribuição binominal e o coeficiente de Alpha de Cronbach com base nas respostas de questionário. Aprovação do Comitê de Ética em Pesquisa da Faculdade Metropolitana da Grande Fortaleza sob CAAE 32613514.2.0000.5618 **Resultados:** A avaliação apresentou Índice de Validade de Conteúdo de 0,93, concordância de aparência com a proporção de 93%, caracterizando o jogo como um instrumento válido. O coeficiente de Alpha de Cronbach total do jogo foi de 0,88, configurando boa consistência interna nas respostas dos juízes. **Conclusão:** O material final está validado e pode ser utilizado nas práticas educativas sobre sexualidade ao público-alvo.

Descritores: Sexualidade, Tecnologia Educacional, Adolescente.

RESUMEN

Objetivo: Validar juego educativo sobre sexualidad para adolescentes.

Métodos: Estudio metodológico de validación de contenido y apariencia por dieciséis jueces expertos seleccionados por conveniencia, según criterios de Fehring ajustados. Se calculó el índice de contenido Validez (CVI) y la prueba exacta de distribución binomial y el coeficiente alfa de Cronbach basado en las respuestas de encuesta. Aprobación del Comité de Ética del Colegio Metropolitano de Fortaleza según CAAE 32613514.2.0000.5618.

Resultados: Evaluación presentó Índice Contenido Validez de 0,93; concordancia de apariencia con proporción de 93%, que caracteriza el juego como herramienta válida. El coeficiente alfa de Cronbach total fue de 0,88, estableciéndose buena consistencia interna en las respuestas de los jueces. **Conclusión:** El material final se encuentra validado y puede utilizarse en las prácticas educativas sobre sexualidad al público objetivo.

Descritores: Sexualidad, Tecnología Educacional, Adolescente.

INTRODUCTION

Sexuality is often understood as synonymous with sexual intercourse. However, considering the complexity of human beings, we must think of sexuality in a broad perspective, as something that is embodied in bodies as we adopt our own ways of living, speaking and relating. Sexuality is embodied through culturally lived situations and directs human relational practices with and with the other.¹

The experience and understanding of sexuality in adolescence has been the target of national and international studies.²⁻³ This is an intrinsic component of the human being and its approach is fundamental in promoting the integral health of adolescents and young people. Issues such as bodily changes, ways of relating and the beginning of sexual practice should be discussed with this audience in a clear and non-judgmental manner.

The active participation of adolescents and the capitalization of their knowledge are essential elements in health promotion actions.⁴⁻⁵ The use of games is an instrument of the educational process in health that favors participation, debates and exchange of experiences, From a critical perspective in relation to traditional education.⁶

The use of educational games for adolescents has shown that playful and participatory work fosters arguments, reflections and collective construction of knowledge among them.⁷⁻⁸ Therefore, it becomes relevant to unleash efforts for the production and validation of educational technologies directed to this public.

Nursing has been producing such technologies, however, the validation of these prototypes is still in reduced quantitative, pointing out the need for creation and validation of these.⁹ This reality refers to the gaps in the production of nursing care when working with adolescents.

The validation process indicates game reliability by supporting such technology for use during educational practices.¹⁰ Thus, in order to contribute to the educational practice of nursing as a health promotion tool, this study aimed to validate an educational game for adolescents about the sexuality topic.

METHODS

It is a methodological study developed in four stages: search in the scientific literature of productions that dealt with sexuality and adolescence; definition of themes and objectives to be addressed to the target audience, game development and validation of content and appearance. Although the description of the production of this construct is not the objective of this essay, it was considered fundamental to give a brief description of the production and dynamics of the game for a better understanding.

The process of production of the game took place from January to September 2015. Initially, searches were made in the *Biblioteca Virtual em Saúde (BIREME)* [Virtual Health Library], specifically in the bibliographic index *Literatura Latino-Americana em Ciências de Saúde (Lilacs)* [Latin American Literature in Health Sciences], International Literature in Sciences (Medline) and the Scientific Electronic Library Online (SciELO). Combined, the descriptors sexuality, educational technology and adolescent were used to carry out the search of the main scientific evidences in national and international scope involving the theme of the study. The search for articles with a year of publication of more than five years was selected as an inclusion criterion, and 48 articles were selected. Manuals from the Health Ministry on sexually transmitted diseases and contraception also produced theoretical support for the delimitation of the topics to be addressed and goals of the game.

After defining the themes and objectives, followed by the elaboration of the prototype of the game. In this stage, the production of the dynamics of the game was produced. The pedagogical framework of Paulo Freire was adopted, which proposes the dialogical action between educators and students. The author presents problematizing education as a possibility to discover, investigate and consider the students' speech and knowledge.¹¹ Based on these premises,

the game was thought and built in a cooperative perspective, which fosters group work recognizing the importance and knowledge of all participants.¹² For the materialization of the prototype we counted on the services of a graphic designer in the production of the images used.

The game was called “*Contando bem que mal tem?*” (Counting well, is there any evil?). The game was validated by a committee of 16 experts with clear knowledge on health of the adolescents and who are able to analyze the content and the appearance of the game. The validation of appearance is relative to the presentation and clarity of the game, certifying its validity.¹³ The validation of content judges whether the educational resource is proficient to represent a universe of a given issue.¹⁴

The adjusted Fehring Model was used as a criterion for selection of the judges for the theme under study (Figure 1). The expert was considered an expert who obtained a score of five or more points.¹⁵ The sampling was done by convenience, with selection of experts after evaluation at the *Plataforma Lattes* (Online Lattes Platform) available by the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)* [Coordination of Improvement of Higher Level Personnel]. Each judge received an alphanumeric code coded by the letter “J” and a cardinal number according to the order of return of the evaluations.

The data collection of the validation stage was performed from October to November 2015. A copy of the game and a folder containing: a cover letter with guidance on the validation process, the validation questionnaire and two copies of the Free and Informed Consent Form were distributed to the judges of the study.

The judges assessed the game against six dimensions - objective, content, relevance, organization, figures and style in writing - with the following options: 0 - not applicable, 1 - totally inadequate, 2 - moderately inadequate, 3 - Moderately adequate, 4 - fully adequate. The data were organized and processed in *Stata 10.0*.

To determine the agreement between the data, the Content Validity Index (CVI) was calculated for the dimensions related to the game content, and the simple percentile for dimensions related to the appearance of the game. The CVI considers the amount of items that score 3 or 4 by the experts. A CVI of 0.8.10 was considered as a cut port.

The exact binominal distribution test, indicated for small samples, was used to estimate the statistical reliability of the CVI of each item, considering a significance level of 5% ($p < 0.05$) and a concordance ratio of 0.8. The estimated for the CVI. The Cronbach’s Alpha coefficient was also used to analyze the internal consistency of the judges’ opinion in each dimension with a minimum acceptable value of 0.7.¹³

The study was approved by the Research Ethics Committee of the *Faculdade Metropolitana da Grande Fortaleza (FAMETRO)* under the *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appreciation] No. 32613514.2.0000.5618, and Legal Opinion No. 702.072. All the ethical precepts of the research involving human beings were respected in accordance with the Resolution No. 466/12 from the National Health Council.

RESULTS AND DISCUSSION

The initial version of the game was called “*Contando bem que mal tem?*” (Counting well, is there any evil?), which was composed by 26 cards color images, printed on *couchê* paper 80 g, with dimensions of 39 x 26 cm. The game has a control card (printed double-sided) and an instruction card produced in equal conditions of the cards images. These items are packed in a Medium Density Fiberboard (MDF) box of size 30 x 43 x 3.5 cm, painted in a clear shade of yellow with the logo of the game logo on the cover (Figure 2).

Figure 2 – The game logo on the cover. *Fortaleza, CE, Brazil, 2015* (Original Figure)



Figure 1 – Adaptation of the specialists’ scores system from the Fehring model - *Fortaleza, CE, Brazil, 2015*

Fehring Adapted Criteria (1994)	Score
Having a Master’s Degree in Nursing.	4
Having a Master’s Degree in Nursing, with the thesis on adolescent health.	1
Have published studies on adolescent health.	2
Having a Doctor’s Degree in adolescent health.	2
Have published articles on adolescent health.	2
Having current clinical practice, at least, with the adolescent health topic.	1
Having a Postgraduate Degree (Specialist) on adolescent health.	2
Maximum Score	14

Based on content extracted from the literature, four comprehensive topics were created as follows: body, relationships, sexually transmitted diseases (STDs) and contraceptive methods (Figure 3). In the cards of corporality were presented images related to modifications, discoveries and care with the adolescent body; relationship, has been associated with several possibilities of relationships and interpersonal experiences; In STDs and contraceptive methods, we searched for images that refer to the main diseases and contraceptives. The control card displays all the cards contained in the game, in small size of 2.5 x 4.0 cm, accompanied by its proper title and with the objectives of discussion specifically determined. The instruction sheet has the dynamics and rules of the game.

Regarding the game, a minimum of four adolescents and a maximum of 26 (total of the cards) are required in order to play, as well as two educators (one facilitator and one observer), with the indication that one is a nurse. The facilitator should explain the dynamics of the game to teenagers: a picture letter will be presented and an adolescent should start a story (true or fictional) based on what he understands from the picture presented.

From that point in time, the facilitator can no longer conduct the game with words, but only showing the cards. After the predetermined time, the facilitator

presents a new image (chosen at random or pre-selected if he or she wishes to discuss a specific subject) and the next adolescent should “continue” the story started by the colleague including the image presented.

The observer, preferably a nurse, will monitor the development of the ownership history of the control card, noting if the objectives outlined in each image card will be considered in the participant’s speech. Thus, the nurse should indicate in the control letter as present when the objective is fully discussed, little present when it is partially discussed, and absent when it was not discussed by the adolescent.

The game ends when the cards are all presented, or when the time set for activity ends. After the end, there should be a discussion between professionals and adolescents, taking up the story told and addressing the images in which the objectives were identified as not present or absent.

After the game was made, it was presented to a committee of judges composed of 16 nurses with graduation time varying from three to 23 years ($\mu = 11.8$; $\sigma = 6.0$), with health care experience from 1 to 23 years ($\mu = 9.13$, $\sigma = 6.8$) and teaching from 2 to 11 years ($\mu = 3.88$, $\sigma = 3.6$). Out of these, 13 (81.3%) have Master’s Degree, out of those 6 (46.15%) are Doctor’s Degree students, 2 (12.5%) have Doctor’s Degree, and 1 (6.3%) have Postdoctoral Degree. Among the judges, 11 (68.75%) had experience in care and teaching, while 3 (18.75%) worked

Figure 3 – Examples of the picture cards referring to corporality, relationships, STDs and contraceptive methods. Fortaleza, CE, Brazil, 2015 (Original Figure)



only with direct nursing care and 2 (12.5%) exclusively in teaching.

The evaluation of the content of the game was carried out by the calculation of the CVI addressing three dimensions: objectives of the game, that pronounce the purposes that are desired to reach through the use of the educational game; the game content, referring to the adequacy of the game to the deprecated theme and relevance of the prototype, which evaluates the degree of significance of the items presented in the game. The value of the general CVI and of each item of said dimensions are presented in Table 1, along with the binomial test and the Cronbach's Alpha coefficient.

In the content evaluation, the suggestion of the seventh judge for the increase in the objectives of the letter "Do not work" refers to ways that do not transmit HIV questions about prejudice/solidarity: "It refers to the importance of non-prejudiced activities to people bearing HIV/AIDS" (J7). Added to the objectives the

item: refers to prejudice/solidarity to people bearing HIV/AIDS. Finally, an adjustment was made in the contents of the title of the "unwanted pregnancy" card presented in the control letter by "unplanned pregnancy".

The appearance assessment was due to the degree of agreement of the judges in three dimensions: game organization, figures and the style of writing. The general agreement and each item, as well as the binomial test and the Cronbach's Alpha coefficient are presented in Table 2.

The total game Cronbach's Alpha coefficient was 0.88.

In the letter alluding to the forms of transmission of HIV, the eleventh judge suggested the inclusion of the image of tableware, considering that it is necessary to demystify the transmission of the virus by this type of tool.

The illustrative image of the character "Zé Gotinha" (Brazilian character in health care service) in the image called "immunization", it was considered by a judge as inducing error or not significant for the proposed objective, which would be verification of knowledge about the prevention of

Table 1 – Content Validity Index (CVI), binominal distribution test of items, and Cronbach's Alpha of the game dimensions "Contando bem que mal tem?" (Counting well, is there any evil?) - Fortaleza, CE, Brazil, 2015

DIMENSIONS OF CONTENT ASSESSMENT	CVI Item	Binominal* Test	Cronbach's Alpha
Game objectives			0.85
-The information/content presented in the game are consistent with the daily needs of adolescents.	1.0	0.000	
-Invites and/or instigates changes in behavior and attitude.	0.93	0.028	
-It can circulate in scientific field.	0.93	0.028	
-It meets the goals of professionals and institutions that serve/work with adolescents.	1.0	0.000	
Content covered in the game			0.89
-The content accurately addresses the subject.	0.93	0.028	
-The content is fully and comprehensively laid out.	0.93	0.028	
-The information presented is correct.	0.81	0.352	
-The simulations are compatible with reality.	0.93	0.028	
-Content is suitable to be discussed with adolescents.	0.93	0.028	
Game relevance			0.59
-The items illustrate aspects important to the practice of nursing with adolescents.	1.0	0.000	
-The game presents key aspects that should be reinforced with adolescents.	1.0	0.000	
-The game proposes the construction of knowledge.	1.0	0.000	
GERAL	0.94		0.88

*Statistically significant for p <0.05.

Table 2 – Concordance level of the appearance assessment, binominal distribution test of items, and Cronbach's Alpha of the game dimensions "Contando bem que mal tem?" (Counting well, is there any evil?) - Fortaleza, CE, Brazil, 2014

DIMENSIONS OF APPEARANCE ASSESSMENT	Concordance	Binominal* Test	Cronbach's Alpha
Game setup			0.47
-The cover is attractive and indicates the content of the material.	93.7%	0.000	
-The size of the title and content in the topics is appropriate.	100%	0.000	
-The material (paper/printing) is appropriate.	100%	0.000	
Game figures			0.64
-The figures are able to catch the attention of adolescents.	100%	0.000	
-The information is exemplified by the figures.	93%	0.028	
-The figures are simple - preferably drawings.	100%	0.000	
-The figures complete the text information.	81%	0.352	
-The figures are clear enough.	87%	0.141	
Writing style			0.88
-The writing is in proper style.	93%	0.028	
-The text is interesting and the tone is friendly.	87%	0.141	
-The vocabulary is easy to understand.	93%	0.028	
-The writing style corresponds to the level of knowledge of the target audience.	87%	0.141	
GENERAL	93%		0.71

*Statistically significant for p <0.05.

hepatitis B and Human Papilloma Virus, through the active immunity provided by vaccination. The judge then suggested adding a syringe to the letter.

The judges' assessment evidenced that the game constituted an instrument of content and appearance apt and valid to perform educational practice with adolescents on sexuality with excellent individual CVI of each item (objective, content and relevance) and general, together with the test and Cronbach's alpha coefficient that confirmed the internal consistency of the validation of the judges. Despite the overall CVI of 0.94, the judges made some considerations that warranted attention.

Although it was considered appropriate to follow the suggestions made by the experts, two of them could not be carried out. The first one is about the evaluation of the appearance of two judges who suggested to review the symbol "red tie" of the letter allusive to the Acquired Human Immunodeficiency Syndrome (AIDS) of the subject STDs, justifying that it is used in other causes, as in the fight against breast cancer.

Such deference was accompanied by divergent scores in the figures dimension in the following evaluated items: the information is exemplified by the figures, the figures are clear enough, and the figures complete the text information. Although the items presented CVI above 0.8, it demonstrated a low level of significance by the exact binominal test in their individual analysis, which probably contributed to the low internal consistency of the judges' opinion in the dimension figures of the game ($\alpha = 0.64$).

The second appears in the content assessment of two judges who uttered: "the game should bring more educational information about each topic so that adolescents can complete the game with more scientific rather than empirical information on the subjects covered" (J1) and "some very specific figures require prior knowledge of the adolescent, will there be any lecture/workshop before or after the application?" (J13).

It is known that the prejudice that surrounds people bearing HIV/AIDS in the family environment, at work and even in the public health services is something present and real, and it becomes necessary educational intervention to rethink these behaviors.¹⁶

Furthermore, several issues need to be demystified. It is known that HIV transmission is through direct contact with the blood, vaginal secretions, and sperm or breast milk of infected people. This contact includes unprotected sexual intercourse (oral, vaginal and anal), syringe sharing, breastfeeding, and blood transfusion.¹⁷

In relation to the fight against HIV/AIDS still, particularly the bond of solidarity, it is confirmed that the red tie was chosen in 1991 in New York City to represent the symbol of the fight against AIDS.¹⁸

The amendment requested in the letter was made, considering that in the National Immunization Program from

the Health Ministry the vaccination against these diseases is available through injectable route.¹⁹

In relation to adolescent pregnancy, it is considered that adolescents, even if they do not plan for pregnancy, can be satisfied when it occurs, not characterizing it as unwanted.²⁰

It is common for adolescent mothers to be less prone to breastfeeding, which may represent a risk factor for newborn weight gain and adverse perinatal outcomes, in this sense, to reinforce the need for educational practices that provide adolescents with reflections, which lead to a healthy and decent life for themselves and their children, is an important consideration in the planning of health promotion actions and adaptation of pregnancy in adolescence.²¹⁻²³

The main pedagogical characteristic of the game is to favor an educational activity based on the theoretical framework of the dialogical approach in the process of health education, thus seeking to escape traditional teaching methodology, in which the educator only deposits knowledge in the mentee's mind.¹¹ Due to such theoretical considerations, the dynamics of the game sought to encourage the active participation of adolescents in the construction of knowledge.

These questions arose in the dimension of relevance, which presents the following as items: illustrate important aspects for nursing practice with adolescents; present key aspects that must be reinforced together with adolescents and proposes the construction of knowledge.

Although there was an excellent CVI in all items of this dimension (1.0), these presented diversity between scores three (moderately adequate) and four (totally adequate) leading to Cronbach's Alpha of 0.59, indicating a lower consistency between opinions of the judges, but by no means invalidating the items.

Health education is an essential tool for health promotion, therefore, it is necessary to improve this practice among health professionals, encouraging the development of dialogic methodologies that break the hierarchy between one who knows and another who does not know, but to raise awareness That they both know different things.²⁴

FINAL CONSIDERATIONS

The construct has been validated according to appearance and content by judges of the nursing area, presenting itself as a reliable material in the educational practice with adolescents. The validation of the judges evidenced that the game constituted a valid instrument with excellent individual CVI for each evaluated and general item, corroborated by the internal consistency presented by the coefficients of the binominal test and Cronbach's Alpha. After proof of validity, the final material is suitable for use in educational practices on sexuality with the target audience. The process of clinical validation of the game by adolescents was the main

limitation of this research, thus proposing the possibility of new studies that make it possible to evidence more strongly the effectiveness of this technology in the promotion of health through its validation among young people.

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