Revista Brasileira de Enfermagem
REBEn

Mental health in adolescence: Elaboration and validation of an educational technology for health promotion

Saúde mental na adolescência: Construção e validação de uma tecnologia educacional para promoção da saúde

Salud mental en la adolescencia: Construcción y validación de una tecnología educacional para promover la salud

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How to cite this article:
Rocha SP, Farias QLT, Vasconcelos MIO, Lopes SMB, Castro-Silva II, Silva KKD, et al. Mental health in adolescence: Elaboration and validation of an educational technology for health promotion. Rev Bras Enferm. 2021;74(5):e20201023. https://doi.org/10.1590/0034-7167-2020-1023

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Submission: 10-18-2020 **Approval:** 01-14-2021

ABSTRACT

Objective: to build and validate the appearance of a digital educational technology to promote the mental health of school adolescents. **Methods:** methodological study, which included the elaboration and validation of the "*Conect@dos com a S@ude*" online course based on the Galvis-Panqueva methodological framework. The elaboration was based on a literature review and followed the Theory of Meaningful Learning. The validation was performed by a total of 21 adolescent students, using an instrument adapted for the study. A quantitative analysis was performed from the Content Validity Index and descriptive of the suggestions pointed out by the target audience. **Results:** the analysis of the Content Validity index ranged from 0.8 to 1 in all evaluated items. The adolescents presented some suggestions for improvement for the course, most of them were accepted. **Conclusion:** the course was validated by the target audience.
Descriptors: Adolescence; Mental Health; Educational Technology; Health Promotion; Validation Study.

RESUMO

Objetivo: construir e validar a aparência de uma tecnologia educativa digital para promoção da saúde mental de adolescentes escolares. **Métodos:** estudo metodológico, que incluiu a construção e validação do curso online "Conect@dos com a S@úde" a partir do referencial metodológico de Galvis-Panqueva. A construção baseou-se em uma revisão de literatura e seguiu a Teoria da Aprendizagem Significativa. A validação foi realizada por 21 adolescentes escolares, por meio de instrumento adaptado para o estudo. Realizou-se análise quantitativa a partir do Índice de Validade de Conteúdo e descritiva das sugestões apontadas pelo público-alvo. **Resultados:** a análise do índice de Validade de Conteúdo variou de 0,8 a 1 em todos os itens avaliados. Os adolescentes apresentaram algumas sugestões de melhoria para o curso que em sua maioria foram acatados. **Conclusão:** o curso foi validado pelo público-alvo.
Descritores: Adolescência; Saúde Mental; Tecnologia Educacional; Promoção da Saúde; Estudo de Validação.

RESUMEN

Objetivo: construir y validar la apariencia de una tecnología educativa digital para promover la salud mental de los adolescentes escolares. **Métodos:** se trata de un estudio metodológico, que incluyó la construcción y validación del curso en línea "Conect@dos con la S@lud" a partir del referencial metodológico de Galvis-Panqueva. La construcción se baseó en una revisión de literatura y siguió la Teoría del Aprendizaje Significativo. La validación se llevó a cabo entre 21 adolescentes escolares, utilizando un instrumento adaptado para el estudio. Se realizó un análisis cuantitativo basado en el Índice de Validez de Contenido y una descripción de las sugerencias señaladas por el público objetivo. **Resultados:** el análisis del índice de Validez de Contenido varió de 0,8 a 1 en todos los ítems evaluados. Los adolescentes presentaron algunas sugerencias de mejoras para el curso, que se cumplieron en su mayoría. **Conclusión:** el curso quedó validado por el público objetivo.
Descriptores: Adolescente; Salud Mental; Tecnología Educacional; Promoción de la Salud; Estudio de Validación.

INTRODUCTION

In Brazil, the Ministry of Health follows the recommendations of the World Health Organization, understanding adolescence as the period from 10 to 20 incomplete years old and youth from 15 to 24 years old, in order to establish that adolescents and young people are in the age group of 10 to 24 years old[1].

According to data from the 2010 Census, this audience represented 51402821 (36.89%) of Brazilians, a population seen as essentially healthy[2]. However, mental health problems in adolescence worldwide are estimated at 16% of the burden of illness and injury; being present in 10% to 20% of this population[3].

In addition, 50% of conditions related to mental health express themselves from the age of 14 years old. It justifies the relevance of mental health promotion actions aimed at this audience, in order to offer protective factors and reduce risk factors, through various platforms, which include the school, community, health environments and digital media[3].

Thus, health promotion contributes to the reduction of vulnerabilities, as recommended by the National Health Promotion Policy, favoring the autonomy of adolescents and their families. This is done through health information, which allows them to make an appropriate decision in the direction of improving their quality of life[4-5].

Information and Communication Digital Technologies (ICDT) are characterized as digital resources for the creation of blogs, educational software and Virtual Learning Environments (VLE) [6], and can represent an efficient strategy to promote health in adolescence. In addition to being based on the concepts of Distance Education (DE), which is due to the affinity of adolescents with technological resources.

Distance education in Brazil is a modality provided for in the Law of Directives and Bases of Education (LDB) since 1996. However, the legislation provides that this "distance" is only physical and/or temporal, not constituting a solitary education, but favoring collaborative learning between teachers and students, in addition to having a multidisciplinary team for the production and management of this educational modality[7]. It is noteworthy that there are several types of DE, in this study Blended Learning or B-learning was chosen, which represents a form of hybrid learning, combining virtual and face-to-face elements[8].

The literature presents some strategies for the insertion of ICDT for the promotion of mental health and converging themes, both in the school environment and in health units. Thus, several digital tools are used, namely: web radio[9]; online chat using social networks[10]; game-based online viral marketing campaign[11]; VLE[12]. However, there is a gap in knowledge about this theme to the detriment of others much more explained, such as sexuality in adolescence.

Therefore, this article presents the construction and appearance validation of an outreach course in distance education in a VLE, which aims to promote mental health in adolescence, through understanding about health and disease, in addition to contributing to the reduction of prejudices, stigmas and negative opinions related to the mental health field, using David Ausubel's Theory of Meaningful Learning as a reference, whose main characteristic is the valorization of the apprentices' previous knowledge[13].

OBJECTIVE

To elaborate and validate the appearance of a digital educational technology to promote the mental health of school adolescents.

METHODS

Ethical aspects

The study was approved by the institutional ethics committee, having respected all ethical aspects established for research with human beings.

Design, study setting and period

This is a methodological study that allows the construction, validation and subsequent evaluation of research instruments and techniques, in order to produce quality materials, capable of replication in other contexts[14]. The design of a methodological study included the construction of the online course: "*Conect@dos com a S@ude*" (Connected with Health) and its validation by the target audience using the Galvis-Panqueva framework[15], in its 5 phases, namely: analysis, design, development, evaluation and administration.

The process of building the course, covering the phases of analysis, design and development[15] took place from March 2018 to July 2019, subsequently the process of validating the appearance of adolescents at a public school in the city of Sobral, Ceara, covering the evaluation and administration phases that took place from August to October 2019.

Population, inclusion and exclusion criteria

The study was developed in a state high school, which has a total of 1250 students regularly enrolled, distributed in three shifts: morning, afternoon and night.

For the selection of participants, the following inclusion criteria were used: being regularly enrolled in the School; being in the age group of 10 to 19 years old, 11 months and 29 days; having availability and interest for online participation in the study in the extracurricular period. The following exclusion criterion was determined: failure to complete the process of validating the course and transferring the school.

The sample was of the non-probabilistic and intentional type[14] composed of 90 students, enrolled in two classes of 2nd year of the morning shift, indicated by the school principal, who considered the schedule of classes and activities of the students. It is noteworthy that of these, 30 accepted to participate in the study, however, the final sample was composed of 21 students who completed all the planned steps, which included the resolution of the validation questionnaires and the performance of all course activities.

Study protocol

Considering the steps proposed by Galvis-Panqueva[15], initially a careful analysis was carried out in the literature, which justifies the

need to create a course on the proposed theme and, furthermore, in distance education. In addition, the objectives and subjects to be addressed, the target audience, the study environment and the technologies to be used were defined.

The definition of the themes took place through an integrative literature review, which aimed to know the factors that impact the mental health of Brazilian adolescents, in addition to an exhaustive search for literature and distance education courses that came close to the proposal of this course on mental health, in order to support the choice of subjects to be addressed in the course modules, which were divided into 6, namely: 1- Introduction to the Course 2- What is Health? 3- Health is mental health! 4- Sexuality in Adolescence: A subject with a lot to talk about... 5- The practice of Bullying in adolescence 6- I already know what affects my mental health ... What now?

The instructional design of the course was then developed, which includes the design of the didactic material offered in the modules. The navigation path on the virtual platform and the educational technology interface, TAS by David Ausubel[13], was used to support the construction of didactic material and the choice of the Modular Object-Oriented Dynamic Learning Environment (Moodle) resources, for integrate the course. For Galvis Panqueva[15], the environment must be pleasant to the eye, objective, well-structured, comfortable and efficient. In addition, he/she points out that the VLE tools are essential in favoring the teaching and learning process, being related to the type of VLE, target audience and teaching methodologies.

It is noteworthy that the creation and maintenance of the course in Moodle version 3.0.3 was carried out by the team at the Distance Education Center of Vale do Acarau State University (NEaD- UVA).

Still, Galvis Panqueva[15] points out the need for an evaluation/validation phase of the system, in general, which takes place based on the judgment of content specialists and technicians, so that they can collaborate with the improvement of the VLE, as well as by the target audience, which in this case are school adolescents. In this study, the evaluation/validation by the target audience was developed.

For data collection, a questionnaire was used to characterize the sample and the questionnaire Software validation module adapted from Batista[16], with a total of 23 questions about the software, educational proposal, interactive environment and computer-assisted teaching, organized on a Likert scale of 1 to 5 (1- No, 2-Partially, with MANY restrictions, 3-Partially, 4- Partially, with FEW restrictions and 5- Yes), made available through the Google forms link.

At the end, a space was made available for participants to express themselves freely, presenting suggestions for improvement, positive and negative points of the course and its importance in helping teaching and learning about mental health.

Analysis of results

The data collected through the validation questionnaire were exported from google forms to the Excel 2010 software, in which they were organized and subsequently processed, as well as analyzed in the statistical software R, version 3.5.0.

To analyze the responses of the adolescents, the Content Validity Index (CVI) was used, which is used to quantify the extent of agreement between specialists, also among members of the population. To reach the CVI, three mathematical equations were used: S-CVI/Ave (average of the content validation indexes for all scale indexes); S-CVI/UA (proportion of a scale that reaches scores: 1 – Yes and 2 – partially with few restrictions) and I-CVI (content validity of individual items)[14]. The item that showed agreement among the members of the population, equal to or greater than 0.80 was considered valid[17]. Thus, the data were organized based on the responses and discussed according to the relevant literature.

RESULTS

Course construction

The construction of the course included the phases of analysis, design and development. In the analysis, the following were determined: the themes and methodologies for preparing the VLE, through an integrative literature review; the target audience defined, considering the need to know and discuss mental health; educational objectives, workload and necessary technologies for the administration and maintenance of the virtual environment, in an exhaustive search for courses offered in this modality.

The main objective of the course was to bring information about the importance of understanding and taking care of mental health. Chart 1 describes the modules, followed by their learning objectives, methodologies used and workload.

The second phase included the design process, in which all didactic material was elaborated, with the best media to be used in each module being defined, considering the themes and learning objectives, defined in the previous step. For the elaboration of the contents, the Theory of Meaningful Learning was used as a reference[13]. For this purpose, manuals from the Ministry of Health, the National Anti-Drug Secretariat (SENAD), from the Ministry of Justice, Ministry of Education, articles available on the internet, YouTube channels, with emphasis on the Video Health Distribution Channel of Fiocruz, websites and blogs on health and adolescence, among other sources.

All material was organized in the form of interactive books, containing: hypertexts, which are texts with links that lead to pages on the Internet, videos and animations; infographics and figures; in addition to discussion forums; complementary activities and materials.

Each module has a personalized label with an image bearing the logo of the course, which is the silhouette of the human head with the name of the course inside, in addition to an image referring to the theme addressed, as can be seen in Figure 1.

In Module 1, below the label, a small welcome text was placed, the tools chosen were: The File, in Portable Document Format (PDF), with the course schedule; the URL that leads to links, in Google Drive, of the Informed Consent Form (ICF) and to a pre-test questionnaire, whose data will not be discussed in this article; the Forum, in which the participants introduced themselves and expressed their expectations regarding the course; the Glossary of words and terms to facilitate adolescents' understanding of the themes.

Chart 1- Modules, objectives, methodologies and workload of the "*Conect@dos com a S@ude*" course, Sobral, Ceara, Brazil, 2019

MODULES	LEARNING OBJECTIVES	PROGRAM CONTENT AND METHODOLOGY	WORKLOAD PER MODULE
1- Course Introduction	- To know the Virtual Learning Environment and its functionalities; - To know the objectives and contents of the Course.	- Virtual Learning Environment: explanation of the Virtual Learning Environment; - Course Objectives and Module Content: text presenting objectives, course load and content.	4H/A
2- What is Health?	- To know the definitions of health; - To know the Unified Health System; - To know the main points of the National Policy for Comprehensive Health Care for adolescents and young people.	- Expanded Health Concepts: hypertext, images and video; - Unified Health System: hypertext on historical aspects, advances and challenges of the Unified Health System; - Policy of Comprehensive Attention to Adolescent Health: hypertext discussing policy. Activity: Record a video of up to 1 minute "What is health for you?"	5H/A
3- Health is Mental Health!	- To know important definitions about mental health; - To reflect on the importance of mental health care and its inseparability with physical health; - To know the main mental disorders; - To classify drugs as legal and illegal, and their effects on the body; - To discuss alcohol and other drug addiction, as well as its health consequences, especially in adolescence.; - To know the National Policy on Mental Health, alcohol and other drugs.	- Important concepts in mental health: hypertext, images and videos; - Mental Disorders: hypertext, videos and infographic on the main mental disorders; - Alcohol and other drugs: hypertext, video, infographic and podcast; - National Policy on Mental Health, Alcohol and other drugs: hypertext and video comparing the last 2 versions of the policy;	6H/A
4- Sexuality in Adolescence: A subject with a lot to talk about...	- To understand adolescent sexuality and its impacts on mental health; - To understand concepts of gender, gender identity and sexual orientation; - To discuss sexting.	- The actions of hormones in the adolescents' body and mind: hypertext and infographic; - Sexuality and Mental Health: report, video and images; - Sexting: hypertext and animation. Activity: chat with artificial intelligence- *Projeto Caretas*[18]	6H/A
5- The practice of Bullying in adolescence	- To discuss about bullying and cyberbullying; - To understand the consequences of bullying for mental health.	- Bullying and Cyberbullying: hypertext, video and images.	4H/A
6- I already know what affects my mental health... What now?	- To know the meaning and functions and devices of the Psychosocial Care Network, as well as the expanded health care network; - To know the Sobral Comprehensive Mental Health Care Network and the expanded network in Sobral- CE.	- Devices of the Psychosocial Care Network and the expanded network (Health, Education, Social Assistance, Non-governmental organizations, among others) in Mental health: hypertext, images and videos; - Devices from the Sobral Comprehensive Mental Health Care Network and the expanded network; - Description of devices, contacts, opening hours and addresses.	5H/A
Total workload	30H/A		

Figure 1- Graphic organization of the "*Conect@dos com a S@ude*" modules

In general, all modules, starting with Module 2, have similar structure and tools, namely: the Book, which contains hypertexts with links, figures, videos, audios and animations; the Task or URL, which directs you to the survey questionnaires and/or activities; the Forum, in which course participants discuss among themselves and with facilitators about the themes of each module; o PDF file of complementary material, which includes suggestions for movies, videos, documentaries, Internet pages, passbooks, digital books and other materials, to deepen the module's theme.

In the development stage, the texts were made available in the VLE using the Hyper Text Markup Language (HTML). We tried to use a simple, direct and objective vocabulary that would facilitate the adolescents' understanding, in order to favor their learning. Activities involving access to social networks were included, such as: Facebook, Instagram and WhatsApp; in addition to the media already mentioned above.

Course validation

A total of 21 adolescents participated in the course validation process. Most participants were female (66.6%), 14 women. The ages ranged between 15 and 18 years old and the family income of the most predominance was 1 to 2 minimum wages, since 14 adolescents (66.6%) claimed to have this income.

All participants had access to the internet at home, but only 8 (38.09%) had a computer at home, thus, most of them had access via their smartphones. The VLE used has support for access on smartphones and tablets with different operating systems, which facilitated access.

The course went through an appearance validation stage with the target audience. Table 1 shows the average of the validation indexes for each item (S-CVI/Ave), as well as the validation index per item (I-CVI) and the proportion of a scale that reaches satisfactory scores (1 –Yes and 2 – partially, with few restrictions) per block of the questionnaire (S-CVI/UAB), obtained by adding the individual CVI of each block and dividing it by the number of questions in it; in addition to the global one (S-CVI/UAG), obtained by adding all individual CVIs and dividing them by the total number of questions.

Table 1 - Content Validity Index Of course Evaluation Items, Sobral, Ceara, Brazil, 2019

Items per block	S-CVI/ Ave	I-CVI	S-CVI/ UAB
BLOCK C			0.93
Objectives			
Clear objectives	1.09	1	
Sufficient functions to achieve objectives	1.38	1	
Arouse interest in the subject	1.3	0.85	
Learning new content	1.3	0.9	
Usability- Interface			
Proper interface	1.14	0.95	
Easily understood functions	1.23	1	
Easily used functions	1.28	0.95	
Amount of information on each screen	1.23	0.95	
Friendly and clear messages	1.23	0.95	
Reporting progress of tasks	1.14	0.95	
Adequate response time	1.14	0.95	
Pleasant media	1.19	0.9	
Balanced colors	1.57	0.85	
Practicality			
It offers different learning paths	1.47	0.9	
BLOCK D			0.9
The software			
Stimulates reasoning and problem solving	1.38	0.95	
Contributes to general training	1.47	0.85	
BLOCK E-1			0.86
The software			
Great possibilities for interaction	1.42	0.85	
Consistent content	1.61	0.8	
Motivates questions	1.42	0.85	
Stimulates creativity	1.28	0.95	
BLOCK E-2			0.81
The software			
Proper vocabulary	1.47	0.8	
Uses strategies to hold attention	1.61	0.85	
Sufficiently in-depth content	1.57	0.8	
S-CVI/UAG	-	0.9	

Note: S-CVI/Ave- average of validation indexes for all scale indexes; I-CVI- validity of individual items; S-CVI/UAB- proportion of the scale that reached satisfactory scores per block of questions; S-CVI/UAG- proportion of a scale that achieves satisfactory scores globally.

The data presented in table 1 show the validity of the course according to the adolescents' evaluation, considering that the average of all items evaluated (S-CVI/Ave) was between 1 and 2, showing the tendency of the respondents to the answers 1- Yes and 2- Partially, with few restrictions; the CVI per item (I-CVI), per block of questions (S-CVI/UAB) and global (S-CVI/UAG) presented a minimum value of 0.8 and a maximum of 1, validating the course for presenting values equal to or greater than 0.8 in all evaluated items.

Despite the good results found, the adolescents presented some suggestions for improvement for the course, which were organized according to the questionnaire evaluation blocks and items, as shown in Chart 2.

Chart 2- Adolescents' suggestions per blocks and evaluation items, Sobral, Ceara, Brazil, 2019

BLOCK E-1: The "Interactive Learning Environment" software	
Evaluation items	**Suggestions**
Great possibilities for interaction	*- Encouraging collaboration among students.* *- Look for other means of interaction between users, not just the forum.* *- How to set up face-to-face discussion and dialogue groups, if possible.*
Motivates questions	*- Having more freedom to express opinions and debate more.*
BLOCK E-2: The "Computer Aided Teaching" software	
Evaluation items	**Suggestions**
Uses strategies to hold attention	*- Having some games.* *- It would be nice if there were games on the themes, face to face dialogues on the subjects, reports on the subjects to better understand what it is like.*
Sufficiently in-depth content	*- Increase the duration of the course.* *- I think the course was great! As I said before, adding more themes would be very good and would help more people.* *- Increase the workload, delve deeper into the themes by bringing shorter and more objective videos so the student can be more interested.* *- Another subjects.*

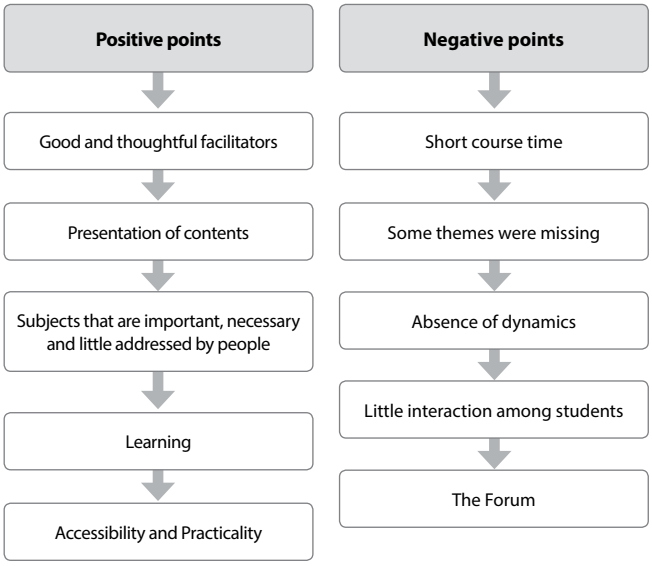

Figure 2 - Positive and negative points of the "*Conect@dos com a S@ude*" course

At the end of the validation questionnaire, participants also pointed out positive and negative points of the course, figure 2 shows what most appeared in the participants' responses.

Course Administration

The administration stage comprises the installation and configuration of the system[15], therefore, it will be constantly updated in terms of content and operating system, with the support of NEaD-UVA. It is noteworthy that the course will not undergo a second round of evaluation with the target audience that has already validated it but is subject to changes proposed by the adolescents who will take the course later, as well as by the judges who will participate in the validation step with experts.

DISCUSSION

The "*Conect@dos com a S@ude*" course falls into the category of outreach courses, which is characterized by having more specific learning objectives. It is worth mentioning that it is not always related to a degree and that it seeks to bring relevant content to its audience at any level of education, through new educational strategies[19].

The internet has an ambiguous role in the adolescents' life, as its excessive use can cause psychological problems and behavioral impact in their life[20]. However, it also represents a tool for searching for information, health-related ones, and can be useful both for coping with diseases and for promoting health[21]. Thus, the Blended Learning or B-learning type of distance learning was chosen due to the proximity between digital technologies and adolescents, as a way to favor health education with the target audience.

B-learning is a type of hybrid learning that combines pedagogical practices of classroom teaching and distance learning. This type of distance education is characterized by its flexibility in teaching and learning methods and processes, which allow the development of more personalized strategies and focused on students' learning needs[8]. It is noteworthy that the course load was 30H/A, divided into face-to-face moments, totaling 7.5 H/A, and the distance, with 22.5 online H/A.

The course had David Ausubel's Meaningful Learning as a theoretical framework, in order to combine the learning of concepts to reach propositions. Concerning the interaction of new knowledge with the apprentice's previous knowledge, combinatorial learning was emphasized, due to the scarce approach to mental health in the daily lives of adolescents, which makes it difficult to obtain specific subsunitors, but does not exclude the possibility of more general ideas about the thematic. It was also sought to develop the progressive differentiation that starts from the approach of more general knowledge, in order to reach more specific knowledge[13].

Therefore, before entering the mental health content, the course addresses the broad concept of health, re-signifying the importance of the Unified Health System – *Sistema Único de Saúde* (SUS) for the Brazilian population, going through the problems that can affect the health of adolescents and mental health. Until the end, with the presentation of the Mental Health Care Network at national and local level.

The didactic material of the course was built with the perspective of presenting the adolescents with different paths that would lead them to the significant construction of learning. The hypertexts with links to internet pages and the complementary material presenting options for movies, videos, documentaries, among others, allow the student to choose how to learn the content. It is noteworthy that the modality of distance education has been increasingly valued, which has been related to quality teaching materials, with clear, interactive and personalized objectives based on the style of the course and the preferences of the target audience[22].

It is understood that the validation with the target audience is an important step in methodological studies, considering that the agreement of those to whom the products are destined is decisive for its effectiveness. The CVI is shown as a widely used method to verify this validity, both for printed and digital resources based on health education: educational video[23], booklet[24], manual[25], course[26], application[27], among others.

It can be seen, through box 2, that the adolescents suggested changes referring only to Block E, which evaluates the software according to its educational proposal. Block E is divided into two excluding parts, Block E-1 related to software such as Interactive Learning Environments and Block E2- to software such as Computer-Assisted Teaching. Thus, E-1 is directed to a more constructivist educational proposal and E-2 to the traditional teaching model[16].

The *Conect@dos com a S@ude* course is more focused on a constructivist perspective, however, it was decided to select some questions also from block E-2, which evaluated items considered important in this research. It is noteworthy that the CVI, per block and per item, was the lowest in Block E-2 (table 1). What may be related to this distance from the course of a more traditional education.

Regarding the suggestions presented, they were brought to the end of the validation questionnaire, through an open question, it is highlighted that only 9 (42.85%) of the adolescents presented suggestions. The remaining 12 (51.14%) did not respond or they said that the course was already adequate and had no new ideas to improve it.

Studies that include validation with the target audience generally present validation questionnaires with open questions that allow more free responses and opinions of their respondents, as observed in other studies that presented results similar to this study in having achieved a positive evaluation by the target audience, who also collaborated with descriptive suggestions for improving studies[24, 27-29].

In block E-1, the participants suggested that the VLE offer other possibilities for virtual interaction besides the forum, and also the inclusion of forms of face-to-face interaction among the participants. It is noteworthy that although the forum was also pointed out as a negative point by an adolescent, who considered that it could cause embarrassment, the tool will be maintained, as it has proved useful for the debate and exposure of ideas by the course participants.

As a form of virtual interaction, chat will be included, which allows users to chat in real time, which can be saved and viewed later by those who participated and by others who were not present in the chat, being ideal for virtual meetings of a class of students who are not available to meet in the same place[30]. In addition, interaction through social networks, especially Instagram and Whatsapp, which has already proved to be efficient

with the students who participated in the validation, will also be encouraged.

A study that aimed to analyze the role of interaction tools in VLE Moodle as a tool for interactivity and collaborative learning in an DE discipline[31] showed that forums, chats and e-mail were the tools used and that they contributed significantly to students' learning, in addition to pointing out Whatsapp as an external tool that also fulfilled a role similar to those already mentioned, being the preferred means of interaction for students.

With regard to face-to-face interactions among the participants, it is noteworthy that because it is a B-learning course, this type of interaction is valid and interesting. Therefore, there will be more moments in which all the course participants can be together in person, which in this validation happened only once, at the closing meeting, mainly due to infrastructure issues at the research site.

Regarding the suggestion that the course should be freer to expose and debate more, it is believed that the format of the course already allows this debate, but that the inclusion of chat and other online tools such as social networks, which provide more moments with all the students of the course, even if in a virtual way, can help to reaffirm this characteristic. It is noteworthy that the union between the virtual and the face-to-face is already a reality in distance education courses, as it is understood that this combination has a lot to contribute to the students' learning, presenting satisfactory results with regard to their satisfaction and performance[32].

In block E-2, the participants brought the inclusion of games, reports, and dialogues to hold their attention, which will be carried out as far as possible, considering the specifics of Moodle. Considering that the interest of adolescents in digital games can be used as a health promotion strategy, as evidenced in a study that proposed to validate the digital educational game "DECIDIX"[33], which simulates the interface of a virtual chat, in which an adolescent talks to a group of friends (adolescents who are currently playing) about an affective/sexual relationship they are living in. The study provides recommendations for investing in the validation of other digital educational games as facilitators of health education, in view of the positive impacts of these tools for health actions with adolescents, due to their proximity to digital games.

Regarding the suggestions to increase the workload, the authors did not consider it feasible to include other subjects and go deeper, considering the way the course is offered now, as an extracurricular activity for adolescents, considering that it was carried out during regular classes. Therefore, increasing the workload could compromise the course in this format that has been developed.

As positive points, the participants highlighted issues related to VLE, about the accessibility of the system, presentation, and relevance of the contents. They also highlighted the attention and availability of the facilitators, virtual and in person.

Finally, it is noteworthy that despite considering that the course has negative points, all adolescents affirmed its importance to help teaching and learning in mental health. Thus, it was considered that the course achieved its objectives.

Limitations of the study

The course is valid in appearance by the target audience, but there is still a need to carry out validation with expert judges.

Contributions to the area

It is hoped that the course can bring adolescents closer to health professionals, collaborating with the debate about mental health, through the union between health education and ICDT, to value students' prior knowledge as recommended by TAS, and resembling the SUS holistic care model, which considers the individuals' knowledge and autonomy as a decisive factor for their well-being. Thus, enabling adolescents to access reliable information that allows them to know more about their health and that of their peers, also contributing to a reduction of prejudices, stigmas and negative attitudes related to the field of mental health.

CONCLUSION

This research made it possible to construct and validate the appearance of a health education tool, in the form of a distance course, in line with the specificities and preferences of adolescents, to produce meaningful learning, considering their health needs.

The CVI reached the pre-established values, being considered valid by the target audience and apt for the validation of appearance and content by the specialists. It is suggested that further studies on the development of digital educational technologies be carried out, as they are powerful tools to promote health, especially in adolescence.

ACKNOWLEDGMENT

We are grateful to all members of the Laboratory for Social Research, Transformative Education and Collective Health (LABSUS) who participated directly or indirectly in this study.

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