

Educative game on drugs for blind individuals: development and assesment*

JOGO EDUCATIVO SOBRE DROGAS PARA CEGOS: CONSTRUÇÃO E AVALIAÇÃO

JUEGO EDUCATIVO PARA CIEGOS SOBRE DROGAS: CONSTRUCCIÓN Y EVALUACIÓN

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ABSTRACT

Study aimed to develop and assess an educational game on psychoactive drugs accessible to blind individuals, conducted in three steps: development of the educative game, evaluation by three special education experts, and assessment by twelve blind individuals. As a result, a board game called *Drugs: staying clean* was developed. In the Alpha version, experts made suggestions regarding the game rules and instructions and the board base, including square texture, game pieces, and Braille writing. In Beta version, we proceeded to the assessment by the blind participants, who suggested changes in the square texture and the addition of Velcro-type material to fix the counters on the board. Then, the Gamma version was played by the last pairs of blind players and was considered by them to be adequate. In the evaluation of the experts, the game was appropriate, as it allowed access to information on psychoactive drugs in a ludic and playful manner.

DESCRIPTORS

Health education
Play and playthings
Street drugs
Disabled persons
Technology

RESUMO

Estudo realizado com o objetivo de construir e avaliar um jogo educativo sobre drogas psicoativas acessível a pessoas cegas, desenvolvido em três etapas: construção do jogo educativo, avaliação por três especialistas em educação especial e doze cegos. Foi construído um jogo de tabuleiro denominado *Drogas: jogando limpo*. Na Versão Alfa os especialistas fizeram sugestões em relação às e instruções e ao tabuleiro: textura das casas, peças do jogo e escrita em Braille. Na Versão Beta, procedeu-se à avaliação pelos cegos, os quais sugeriram alterações na textura das casas e colocação de *velcro* para fixação do pino no tabuleiro. Passou-se, então, à Versão Gama, jogada pelas últimas três duplas de cegos e considerada adequada. Na avaliação dos juízes, o jogo revelou-se adequado, pois permite o acesso à informação sobre drogas psicoativas de maneira lúdica.

DESCRIPTORIOS

Educação em saúde
Jogos e brinquedos
Drogas ilícitas
Pessoas com deficiência
Tecnologia

RESUMEN

Estudio efectuado con el objetivo de construir y evaluar un juego educativo sobre drogas psicoactivas accesible para personas ciegas, desarrollado en tres etapas: construcción del juego educativo, evaluación por tres especialistas en educación especial y doce ciegos. Fue construido un juego de tablero llamado *Drogas: jugando limpio*. En la Versión Alfa, los especialistas realizaron sugerencias en relación a las instrucciones y al tablero: textura de los compartimentos, piezas del juego y escritura en Braille. En la Versión Beta fue realizada la evaluación por los ciegos, los cuales sugirieron alteraciones en la textura de los compartimentos y colocación de *velcro* para fijación del perno en el tablero. La Versión Gama, jugada por las últimas tres parejas de ciegos fue considerada adecuada. En la evaluación de los especialistas o jueces, el juego educativo fue evaluado como adecuado, ya que permite el acceso a la información sobre drogas psicoactivas de manera lúdica.

DESCRIPTORIOS

Educación en salud
Juego e implementos de juego
Drogas ilícitas
Personas con discapacidad
Tecnología

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INTRODUCTION

All individuals are vulnerable to drug use and addiction, independent of race, color, age or social class. This includes blind individuals, who present developmental characteristics similar to other human beings. In Brazil, close to 45 million people present some physical disability, among these, visual impairment is projected to account for almost 35 million affected individuals⁽¹⁾. This is an alarming reality, mostly because prevention and the fight against drugs limit blind individuals' access to information, by using mainly paper-based and ink-written materials, illustrations and/or television images to share the messages.

Among the feasible technologies for the promotion of health to a blind individual, Assistive Technology (AT) emerges. Assistive Technology is defined as a body of strategies and practices designated to assist daily life activities performance by people with disabilities, propitiating their independence and autonomy⁽²⁾. Games adapted to blind individuals appear as a possibility to educate in a different way, by associating a ludic manner with the capture of information and knowledge. Therefore, games can be considered as a form of AT.

In health education, games constitute an interactive and motivating resource, able to generate learning and promote dialogue, besides facilitating the approach of certain themes and the debate on everyday life situations. The ludic potential of a game is closely related to its suitability to an objective and a target audience⁽³⁾. Several educative or ludic games are available to blind individuals, such as: decks marked in Braille with enlarged images and characters, chess, checkers, dominoes, backgammon, tic tac toe, battleships, and so on. The most commonly used by the blind are dominoes and checkers, usually available online.

Even with such a variety of materials and adapted games, few are aimed toward education for health promotion purposes. In view of this fact, we questioned: is there a valid reason to develop an educative game aimed to approach the theme of psychoactive drug use as a way to offer blind people information access?

We believe the answer to be positive, since the lack of publications about this matter and the absence of statistics about drug use among blind individuals highlight the importance of substance abuse prevention in this scenario. We hope, therefore, that the development of this educational resource in a game arrangement could turn into an AT for information access on psychoactive drugs and be used as a tool for nurses involved with health education. Therefore, the aim of this study was to develop and assess an educative game on psychoactive drugs for blind individuals.

METHOD

This refers to a study of an AT development and assessment, in the arrangement of a tactile and accessible educative game for blind individuals about psychoactive drug use. The research project was conducted in the physical and technological structure of the Health Communication Laboratory (*LabCom_Saúde*) located at the Nursing Department of the Federal University of Ceará (UFC), northeastern Brazil.

Data collection was conducted between June and August 2010, in three steps, represented by the three versions of the educative game entitled Alpha, Beta and Gamma. The Alpha version consisted of the development process of the tactile educative game, which included: the concept, types of drugs, description, damages from drug use, situations related to drug use, and ways to find help. This information was elaborated based on an educative text about drug use prevention, validated by judges in a previous research study⁽⁴⁾. Adapted to the ludic language, the content was polished according to the board game mechanics, with different numbers of squares and game cards correspondent to them, containing questions or situations about drugs, followed by the game rules and instructions, written both in ink and in Braille.

This version was assessed by three experts in special education, in individually appointed days and hours, in the presence of the researcher. The choice of an odd number of judges has been used by other studies, showing the importance of this decision to avoid ties in items assessment⁽⁵⁾.

The assessment tool was a questionnaire that approached the game language adequacy for the blind individuals. All the relevant suggestions were considered and the game returned for assessment to the same experts until all the suggestions were included and approved. As a result, the Beta version was developed.

For the Alpha version, three pairs of blind individuals who played the game in the presence of the researcher also assessed the Beta version. The players explored the board game, the pathway of the squares, identifying its textures, the wooden boxes where the game pieces and counters were displayed, recognizing the difference between them. The game rules and instructions were available in writing and audio records. Also in this step the pertinent suggestions were considered, and by including them the Gamma version was created. To register the observations during the steps, the researcher used a field diary.

The data presentation and analysis occurred consecutively, according to the following methodological stages: description of Alpha version development, followed by the special education experts assessment; description of the Beta version, assessed by the first group of blind players, and

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afterwards, the assessment by the second group of blind players who approved the final version (Gamma version).

The UFC Board of Ethics in Research approved the research project. The study participants signed a free and informed consent form and all the ethical considerations were attended. The letter J was attributed to each study participant, followed by the entry number of the game participants.

RESULTS

The results are presented according to the study phases: Alpha and Beta version, and finally, the Gamma version.

Alpha version

For the development of the educational game, we analyzed the available board games in toy stores, according to the board game mechanics, including items such as the board path, opposing players racing one another across a finish line, a winner, rules and instructions of how to play, and so on. The physical components considered were: a board with squares, playing cards, counters, round bits, square bits, and three wooden boxes in which to store the game pieces. The game was entitled as *Drugs: staying clean*, given that the word *clean* is used when a user stays free from drugs (by not using it) for more than one day.

For the base of the game, we used cardboard material measuring 57 centimeter (cm) length X 47 cm width, covered with a black card stock. For the 35 squares that composed the board path, we used five types of paper with different textures, measuring 5X4, and 5X5 for the two squares located at the board path curve. The path was drawn with the squares paired up side by side horizontally, clockwise, next to the edge of the board. The starting position and the ending point were flagged with the words *start* and *end* written in ink and in Braille.

The game cards contained information on psychoactive drugs, summarized in a direct and ludic language and organized under the categories: concepts, data and statistics, or curiosities (corresponding to the *Learn more* squares); drug use harms and risk factors (*Enemies* squares), protective factors and forms of support (*Friends* squares), types of drugs, their classifications and signs/symptoms related to their use (*Drugs* squares). Questions on the cards aimed to transmit knowledge, and stimulate curiosity and reflection on the matter. The answers led to dynamic game moves, depending on the success or lack of success of the players in responding to the questions.

The game pieces were placed in wooden boxes identified on the outside. In the box *Start*, two pieces of paper written in ink and in Braille indicated the first and the second player. In the box *Life*, the players found the counters to be moved in the board path. Each counter presented a different volume at its head to differentiate each one of them.

Round bits made of plastic, 2 centimeter in diameter, represented the life points earned. To win or lose a life point depended on the successes or mistakes of players during the moves. In the box called *Number of squares*, square pieces made in sheets of 60 kg (letter-sized) paper, numbered from 1 to 6 in Braille characters, represented the number of square(s) that should be moved through the board path. Special education experts assessed the Alpha version of the board game, which, after several adaptations, resulted in the Beta version.

During the experts' assessment, the importance attached to the game was observed by their attention to the game details. They analyzed the dimensions of the board game, of the squares, and also the measures of the letters written in ink, even knowing that the game was targeted to blind people. The game pieces were analyzed individually, considering their texture and dimensions, in order to offer comfort for the game user while playing with the material.

The experts were meticulous while assessing the AT. The expert who stood out among the judges was the one who, besides being specialist in education for disabled people, was also blind. This person, in a very particular way, assessed thoroughly each game piece, and showed interest in using the game in the classroom as an educational material to discuss psychoactive drug issues.

Beta Version

In this version the board game base was maintained in paperboard covered by black cardstock, but the dimensions were modified to 42.5 cm length X 38 cm width. The squares remained placed from left to right, clockwise, and the beginning of the path was located at the upper left corner of the board. The squares measured 4X2, and the two squares situated at the path's curve, 4X4. Five different textures were maintained: wavy, rough (sandpaper), velvety, EVA (Ethyl Vinyl Acetate) and card stock. For the starting point of the squares trajectory, we used a piece of string shaped as an arrow. For the ending point, the expression *THE END* was written in ink and in Braille.

The game card dimensions were standardized to 15X15.5, adequate to the size of the longest question of the game written in Braille. In the center of the board, the name of the game *Drugs: staying clean* was adjusted to the size of the base. To preserve the distinction of the counters we used a Velcro-type material. Written in ink, the rules and instructions of the game took about one page and a half, and in Braille writing, the instructions took about four pages and a half. The instructions were also recorded, as suggested in the first assessment conducted by the experts, and the audio in a CD was incorporated to the game. On the bottom right side of the board, the names of the game authors were written in ink and in Braille. While assessing the game, the blind individuals pointed out the need of reworking the board dimensions and textures of the squares. The Gamma version was developed by accepting their suggestions.

Gamma Version

This version became the final version of the game. It presented the following characteristics: board game base made with paperboard covered with black cardstock, dimensions 42.5X38, squares placed from left to right, clockwise, with the starting point located at the upper left corner of the board. The dimension of the squares was 4X2, except the two squares situated at the curve of the path, which measured 4X4. The squares were differentiated by five textures: wavy, rough (sandpaper), velvety, EVA (Ethyl Vinyl Acetate) and card stock, and each square had in its surface a Velcro-type material shaped in a rectangle format, measuring 1X2, to facilitate the counters to move through the board path. To indicate the starting square, a piece of string shaped as an arrow was used. The ending point was designated by the expression *THE END* written in ink and in Braille.

The game cards were standardized in measures (15X15.5), and the name of the game, located at the center of the board, was proportional to its size. Velcro-type material was used to differentiate the counter's body and to stick the counter base to the square, facilitating the moves through the board path. In this version we added the audio recording of the rules and instructions. On the bottom right side of the board, the name of the authors of the game was maintained, written in ink and in Braille. After being assessed by the last pair of blind individuals, the Gamma version was considered accessible and appropriate to the teaching and learning process.

During the moves, the blind individuals showed interest for the game, as observed in the speech of players number 10 and 11:

We see things [information] that we do not see in our everyday lives, that it is not talked about, at least in our midst (J7);

It is, it is interesting. It is a way to play and acquire information (J11);

This game should have been made to play earlier, from 15 or 16 years old (J10, J11).

Beyond the interest showed by players, the discussion among them allowed the reinforcement of essential information, such as that one should not drink alcohol beverages and drive:

Don't you know that a drunken person can cause accidents? The rates of car accidents are high because people drink and drive [...] (J1).

DISCUSSION

Ludic activities can be integrated to educational, recreational and socializational projects. They appreciate creativity, sensibility and the pursuit of affectivity for those who perform and experience them. In addition to that, ludic activities are tools that help nurses in their role as health educators⁽⁶⁾.

As perceived in this study, the ludic, represented by an educative board game, is considered positive to the teaching and learning process and evokes interest in an enjoyable way when referring to the theme of *drugs*. The use of educative materials and technologies as resources for health education are increasing, and they have been assuming an important role in the teaching and learning process⁽⁷⁾. With the ludic component, comes the possibility of more satisfying learning, in which the educator acts as a facilitator and the previous knowledge of the individual is appreciated⁽⁶⁾.

The release of the rules and instructions of the game in a variety of forms enabled the blind individuals accessibility. However, the majority of players preferred the researcher to read the instructions. Not at any moment was the record in CD format requested. This might inform that the reading of the instructions by a third person (in this case the researcher) is perceived as more dynamic. Moreover, it could clarify possible doubts in real time.

It can be that some blind individuals are not literate in Braille, others have developed a good hearing memory and prefer this communication track, and also that some choose the interpersonal relationship as a mediator for information. We considered that all options should be considered in health educative games aimed toward blind individuals, meriting more studies on this. Educative practices should propitiate to individuals the opportunity to obtain information and acquire skills for decision making, in an attempt to achieve a better quality of life⁽⁸⁾. In the game card questions, besides those which led to short and clear answers, we also covered likely situations from daily events, which led to different answers, not only to inform, but also to favor reflection about the theme.

Therefore, an educational game is a method by which an individual can become directly involved in the decision making, whereas in the traditional teaching and learning process frequently the answers are given without the incentive to any kind of reasoning⁽⁹⁾.

One of the stack of game cards associated to the square *Friends* and to the square *Enemies*, in which players were expected to solve a situation described, enabled the pair of players to reflect and discuss the best way to address a situation during the game moves. This characteristic helped maintain the game dynamics, besides being an opportunity to share experiences between players. As observed in the literature, educative games are efficient tools of teaching and learning, as well as for communication and expression⁽¹⁰⁾.

In this assessment we confirm that it is indispensable to identify the specificities of the population of interest in order to achieve the expected results⁽¹¹⁾. Furthermore, the inclusion of judges with the same characteristics of the target audience provided for an even more enriched assessment. Such evaluations contributed efficiently to the adequacy of the proposed material, turning it into an AT.

This shows the importance of the multidisciplinary work and emphasizes the intersectoriality as a direction to the achievement of best results. A study conducted with oncologic pediatric patients, in which an educational game was developed in video, required resources and experts in this specific technology. The game was a useful tool to the improvement of the understanding of these children during treatment and promoted self-care⁽¹²⁾.

In addition to scientific and specific knowledge about the theme on psychoactive drugs, nursing professionals can and should search for partners in other areas of knowledge, such as education, aiming to promote health and care, and expand the possibilities of their performance as nurses⁽¹³⁾.

By developing AT targeted toward health education and the blind population, supported by special education experts and by the appropriation of ludic resources, a breakthrough in the conventional health education paradigm is achieved, being aligned with drug use assistance guidelines, such as intersectoriality, comprehensive care, promotion and protection of health, and also implementing an effective nursing performance⁽¹⁴⁾. As educators, nurses can realize that a change in the rhythm and the addition of the ludic can favor the individual learning⁽¹⁵⁾.

While assessing the game, the blind individuals expressed their wish to have other colleagues from their educational institution participating in the activity. They reported that this might be a good possibility for them to discuss drugs issues. Endorsing this information, publications affirm that games can offer a structure for facts and knowledge acquirement⁽¹⁵⁾.

In general, positive and encouraging results are noted with the use of ludic technologies for young and adult audiences. Professionals in health and education share the idea in which educative materials are facilitator elements and complements to the pedagogic practice⁽¹⁶⁾. In both health care scenario and classrooms, this resource is adopted with the permission of the participants, when difficult issues to approach are discussed, as in the case of the psychoactive drugs.

The game *Drugs: staying clean* enabled the observation of the educative game acceptance by looking at the blind participants in the moment of the moves, when they felt interest in showing the partner something curious, such as the different counters, reminding each other about the rules and instructions of the game, and expression of anxiety when realizing that the colleague did not know the answer of the game card question when he/she did.

The game was perceived by the participants to be interesting as a strategy to address the topic of psychoactive drugs, which was considered complex to approach in everyday life and in familiar and school environments, places where they spend most of their time. During the moves, the knowledge on the subject was captured at the moment they visualized the questions in the card game, and even questions considered as simple were still unknown by some participants.

In the stack of cards entitled, *Learn More*, for example, there was the following information: *Tobacco and cocaine use by pregnant women can cause growth retardation of the baby, miscarriage and premature birth*. The fact that tobacco consumption harms the pregnancy and the baby did not represent a new fact. However, the information on the drug use as a cause for the child's death and the termination or anticipation of pregnancy elicited surprise in some of the players, revealing that significant consequences of drug use were still unknown. When faced with the information that *Passive smokers have higher risk of developing the same diseases that affect smokers*, some participants showed signs of anxiety and concern. The feeling of concern was due to the awareness that the simple fact of being present in places with smokers, even without smoking, means a possibility of developing the same diseases as smokers, and even with a higher risk. This information leads to reflections on the responsibility of the individual who consumes this type of drug, once, in addition to harming him/herself, he/she impacts other people in his/her own social conviviality, including family, friends and acquaintances. It is noteworthy that the *Learn more* stack of cards did not pretend to provide direct interaction between players; however, it gave rise to discussions about the organization of previous ideas. This fact confirms the thought of this study's authors who claimed that the educational game provides an educational experience in which the individual learns independently⁽¹⁷⁾.

In addition to information about known and socially accepted drugs, the blind participants had acquired information about LSD, used mainly by youth in electronic music parties. Upon reading the card game containing the information that LSD can cause psychological effects even after it use is stopped for weeks or months, they had the notion of the powerful and dangerous effect of this type of drug.

At the game moves, the enthusiasm of the players pairs to debate about the accuracy of the card game's information or to highlight something previously unknown, showed how restricted the discussion of this subject was in their everyday life. The difficulty in approaching the drug theme with adolescents was revealed, especially at home, in which parents are resistant to talk about it with their children.

The square *Friends* presented the following situation: *John is saddened by the separation of his parents and because of this he feels depressed, losing interest in school activities. How can we help John to prevent drug use as a refuge from his problems?* This case is common today, when many young people witness the separation of their parents and the conflicts generated inside the family. Some turn to drugs trying to escape from problems. Faced with this question, the players got lost in thoughts and appealed to the other player questioning: What to do to help? From this fact emerges the hypothesis that, if, in real life they experienced a situation like this, they would not be able to solve it, or, if they were in the parents' role, they would not know how to help their children. The solutions were similar to the response given by the game card: the family should dialogue with John,

stimulating the practice of other activities, such as sports, and delegate responsibilities, among other tasks.

In a study conducted in Colombia, teen parents did not express the need to discuss the topic of drugs with their children. This fact can be attributed to ignorance of the need to initiate prevention to drug use at an early age. Parents might feel that there is no risk of drug abuse in the family environment⁽¹⁸⁾. As can be seen, parents are unaware that the family is a protective factor for children's drug use.

Considering this knowledge, part of the card game's questions related situations regarding parents or family environment, enhancing discussions and reflections on the importance of family as a protective factor. While not all players were parents, the debate on the subject enabled the discussion of this problem. In consonance with the literature, the family plays a central role in the transmission and spread of values. This information, transmitted either through formal or informal education, is processed and remodeled, allowing the individual to develop a vision of the world and how to be inserted into society⁽¹⁹⁾.

It is worth remembering that the lack of knowledge on the theme is not restricted to lay persons, such as parents. According to a survey conducted with nursing students, they too experienced difficulties in planning intervention strategies for alcohol and drugs abuse⁽²⁰⁾. A research study developed to estimate the knowledge of nursing students on alcohol and drugs, verified that for 83.3% of the respondents, the acquisition of knowledge about alcohol and drugs is useful for personal purposes and for 91.7%, this issue should be kept in the nursing curriculum⁽²¹⁾.

The game attracted the attention of players regardless of age, and was a dynamic and motivating experiencing, as observed in the study that used the game as a tool to teach pediatric issues to medical students⁽⁹⁾, and it was possible to apply it for an underage audience.

The intention to work with this subject with the blind population and evoke their interest in discussing and reflecting on it highlight that the game brought this action in a playful manner by using a game to motivate the discussion of the theme, with no claim to assert that a proper prevention of drugs would be performed.

During the evaluation of the game, the blind participants could review some concepts and imagine themselves in hypothetical situations. The laughter of the players in the face of doubts about an answer and the comments made while thinking about how to solve the situation revealed the truth of the awareness exposed in the game cards. This feedback is important during the process of playing the game⁽⁹⁾. The problem described in the game card has a likelihood of occurring, being common in everyday situations, in the testimonies made by players. The complication, however, lies in not knowing how to act, due to the lack of knowledge. For example, in one card the following is described: *Regina is shy. She goes out with her friends at night. She drinks and*

uses other drugs to create courage to dance and flirt. What should you do to overcome shyness without using drugs? Participants knew that this truly happened with drug users, though they were unaware of forms to help.

Certain game cards argued about risk and protective factors. Players found the answers by using their prior knowledge of factors that helped to prevent the use of drugs, however, they did not know the definition of these concepts. Such prior information was accumulated and constructed by situations they experienced, witnessed or knew from testimonies of friends or acquaintances, in television news, at school or in other scenarios. Curiosity about drugs can be just the interest of the unknown, but its abuse is a complex phenomenon and a major concern worldwide⁽²²⁾. In this context, educative games can contribute significantly to thought on this matter. Seen as a technical and methodological renovation, games incorporate dialogue and reflection on the teaching and learning process.

CONCLUSION

We conclude that the development of the educational game *Drugs: staying clean*, and its evaluation by special education experts and by blind participants, provided a reflection on how innovative the production of ludic material is to promote health education and how unique is the audience, which requires creativity and knowledge of nurses. Moreover, a critical appreciation of the special education professional revealed that there is still much to learn about assistive technologies. However, this fact aroused greater interest in how the game would be received and evaluated by blind participants.

As noted, the game initiated debate and reflection between players who proposed to expand the activity application to people under the age of 18 years. They were open and interested in participating in the game assessment and denoted surprise facing what they used to know when it comes to the subject drugs. They also indicated colleagues to know the game mechanics. This shows the importance of having the technology assessed by experts, since there is a need to adjust the level of complexity of the content, language, information, rules and instructions, and game mechanics, among other aspects, according to the audience to be reached.

We emphasized as a positive result of this study the adoption of new paradigms in appropriating pedagogical resources to promote health education for adults. The educational game appears as a resource that enables the individual to engage in educational activities and to provide access to information in a creative and playful manner.

The presence of the researcher was helpful to clarify doubts, however the question is: What if he/she was not present? How would the development of the game be if the researcher were not there? What resources would be preferred: audio recording or Braille? Or, even further: would the presence of a facilitator be desirable or not? These questions suggest new studies to answer whether audio recording or Braille would allow the same results found herein.

A limitation of the study, but already visualizing its improvement, is the need for validation with blind participants in statistically significant populations and randomized blinded experiments with other age groups and educational levels.

Therefore, the educational game can be used by nurses to include this population in the process of health promotion, particularly with regard to subjects difficult to discuss in the family or at school, which represent the basis of an individual's education.

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