ORIGINAL RESEARCH

Drug Education Games for Youth

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Abstract

Background: This integrative review aims to explore the goals of drug education games for youth and to propose recommendations based on a collective health framework. Methods: A database search was conducted of five Indexes and grey literature, using the following inclusion criteria: theoretical, observational, experimental, or qualitative studies that described or analyzed educational games to prevent or treat drug use in young individuals (15–29 years of age). Results: Eight different games were presented in 16 articles. The games were used in public schools and psychiatric hospitals. They are designed to persuade and capture the attention of young individuals. Educational games were produced mostly by research institutions and supported by grants from public institutions. Results indicate that the majority of games were designed to teach specific skills and to convey information. Overall, they do not allow for creative or unexpected answers, although a few exceptions were found. These games also ignore economic, historical, and cultural aspects of the drug phenomenon, thus aligning with the ideology of the War on Drugs. Conclusions: Despite their flaws, the games have potential applications that allow us to recommend them in daily practice as useful methods to support a broader and more analytical educational process.

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Introduction

This study focused on games designed as educational tools to address issues related to drug use. Such games can foster discussion of differing views on social values; enable intense, pleasurable, and interactive participation; and produce reflection on health issues. (Yonekura and Soares, 2010)

Emancipatory education, a process constructed from a collective health framework (Soares, 2007), is a powerful tool to promote understanding of the social determination of health; it is a process with the potential to politicize the drug phenomenon. (Almeida, Trapé, and Soares, 2013) According to emancipatory education, drug production, circulation, and consumption are pedagogical contents for increasing awareness and reducing harm among users and non-users.

Emancipatory education also helps to explore the class interests implicit in hegemonic practices. (Santos and Soares, 2013) In the case of drugs, education can help youth to understand how the system of production, distribution, and consumption of these substances are related to capitalist structures and dynamics. This explanation politicizes the discussion and critiques the psychiatric explanation, which maintains that individual biology is the cause of drug use. This debate also questions the pharmacological explanation that focuses on the action and power of drugs on the central nervous system. (Soares, 2007)

Educational games in the collective health framework may be a powerful method to stimulate critical discussions on complex issues from the perspective

Table 1. References to drug games identified per data source		
Data source	*Search strategy*	*References identified*
PubMed	game, drug abuse	182
SciELO	drogas and jogo	5
Latindex	droga prevención	5
ACM Digital Library	game drug abuse prevention	38
IEEE Xplore	game drug prevention	1

of the players; such games take on an emancipatory quality by generating new social practices. (Yonekura and Soares, 2010)

This article aims to answer the following questions: (1) What are the objectives of drug educational games for young people? and (2) What are the recommended games from an emancipatory educational perspective?

Methods

This study is an integrative review (Whittemore and Knafl, 2005; Soares et al, 2014) that identified drug educational games, using different data sources (PubMed; SciELO; Latindex; ACM Digital Library; IEEE Xplore) and a manual search of the references of the primary studies identified. It also searched for grey literature through Google Scholar. The search was conducted in June 2015.

Only theoretical, experimental, observational, or qualitative studies describing or analyzing educational games designed to prevent or treat drug use in young individuals (15–29 years of age) were included. To be part of the analysis, articles had to present interactive interventions as "games." These games had to be available for access or described in such a detail that anyone could play them.

A data collection form was created to extract data from the selected studies. This instrument gathered key information such as game name, language used, year of the article, country of the author, format of the game, theory, number of players, scenario, target audience, institution responsible, outcomes, and availability.

As proposed by Soares et al (2014), the theory that guides the question and the analysis of results in a review should be made explicit. Thus, studies in this review were analyzed from an emancipatory harm reduction and collective health framework. (Soares, 2007)

Results

Initially, 231 articles were identified (Table 1); most of them addressed "drinking games" and "gambling disorder." These were excluded from the analysis. The review also excluded *Good Behavior Game* (Poduska et al, 2008), because it is a general behavior management method to be used in the classroom and does not refers to drug use. Two other games were excluded, one because it is exclusively focused on adults (*Guardian Angel* - Verduin et al, 2013) and the other because the author's contact information was not available. (*InDroga* - Patiño, 2004)

In this study, we considered games to be structured tools to support drug education for youth. Games that promote activities aimed at young people in mental health services but that do not involve an educational tool, such as "Copa da Inclusão" (Otsuka, 2011), or cooperative games with crack users, conducted by Alves and Araújo (2012), are not within the scope of this article.

The search on Google Scholar returned 1 article, and the manual search of bibliographic reference lists of primary articles produced another 6 articles. (Table 2)

In order to be included in this study, the game had to be available for use or fully described in the article or elsewhere. For this purpose, we performed a web search or directly contacted the authors and institutions.

Although there are videos and information about most of the games considered here as "not found," these games seem to have been developed for specific

studies and were subsequently discontinued. Only 8 games were selected for analysis, as they were available or described in detail: *Jogando Limpo*, *Downward Spiral*, *Reconstructors*, *N-Squad*, *Jogo da Onda*, *Pick-Klop*, *Jogo da Escolha*, and *RPG Desafios*.

Table 2: Availability of the games.	
Game	*Availability*
RPG Desafios	The game is for sale (Araújo, 2009).
Jogo da Escolha	The cards are available online: <http://www.cpad.org.br/files/downloads/Jogo_da_Escolha_Cartas.pdf>.
Jogo da Onda	The game is available by Laboratório de Educação em Ambiente e Saúde/IOC/FIOCRUZ <zigzaids@ioc.fiocruz.br>.
N-Squad	The game is available online: <http://webadventures.rice.edu/stu/Games/N-Squad/>.
Reconstructors	The game is available online: < http://reconstructors.rice.edu/>.
Downward Spiral	The game is available online: <http://ibr.tcu.edu/manuals/other-interventions/>.
Jogando Limpo	The game is described in Mariano (2010).
Pick-Klop	The board of the game is described in Khazaal et al (2013).
Happy Farm	Not found (Gamberini et al, 2009).
VIDEODOPE	Not found (Gamberini, Breda, and Grassi, 2007).
Motorcycle racing	Not found (Noble et al, 2000).
Drugs and the brain	Not found (Cheng and Annetta, 2012).
Thinking not drinking	Not found (Schinke, Schwinn, and Ozanian, 2005).

Table 3 describes characteristics of the studies, including author, publication year, country of the lead author, outcomes interventions, and names of selected games. Articles that discuss the same game, as well as references to different episodes within the same game were grouped together. Sixteen (16) articles were grouped representing the 8 selected games. The studies were published since the late 1990s, and the predominant countries of the first author were Brazil and the United States. Games were developed, suggested, or tested for use by young individuals between the ages of 15–29 years. The most common concern during the development of the games was the language; games were adapted to "youth language." For example, technical terms, long sentences, and slang were avoided. Such language is intended to appeal to a greater number of people and to enhance adherence to the games' rules.

Games were tested on students in public middle and high schools (*Reconstructors, Downward Spiral, Reconstructors, N-Squad, Jogo da Onda and RPG Desafios*), or hospitalized patients (*Pick-Klop* and *Jogo da Escolha*). Nevertheless, the outcomes of such interventions indicate that the games also can be useful in the treatment and prevention of drug dependence in the general population.

The games vary in format: board (*Downward Spiral* and *Jogo da Onda*), card (*Jogo da Escolha*), tactile for the blind people (*Jogando Limpo*) and digital (*N-Squad* and *Reconstructors*).

The games are designed to persuade and capture the attention of young individuals. The persuasion strategy involves creating realistic environments for drug use and providing feedback. Some games call themselves "persuasive technologies" because they seek to change beliefs, attitudes, and behaviors.

Educational games were produced mostly by research institutions and supported by grants from public institutions. Through dissemination and funding, different governments had stimulated production of educational games aimed to solve problems related to drug abuse.

Some of these games are available on the internet (*Jogo da Escolha, N-Squad, Reconstructors* and *Downward Spiral*), two are described in articles and can be reproduced (*Pick-Klop* and *Jogando Limpo*), one can be ordered for free of charge (*Jogo da Onda*), and one (*RPG Desafios*) was created for sale. Of

Table 3. Identified references, countries, game names, and outcomes			
Author (Year)	*Country*	*Game Name*	*Outcomes*
Cortes (1999); Rebello, Monteiro, and Vargas (2001); Monteiro, Vargas, and Rebello (2003)	Brazil	*Jogo da Onda*	Based on the results of initial research, new contents were developed and evaluated to emphasize different challenges faced by youth nowadays.
Miller et al (2002); Miller et al (2006); Klisch et al (2012b)	USA	*Reconstructors*	Analysis of the pretest and posttest scores demonstrated significant knowledge gain.
Williams, Meyer, and Pechansky (2007)	Brazil	*Jogo da Escolha*	The game is useful for examining the typical core beliefs of young drug users and to promote coping skills in risky situations.
Timm (2009); Araújo, Oliveira, and Cemi (2011)	Brazil	*RPG Desafios*	The game is useful for training in skills for dealing with problem situations and changing the belief that drug use is a strategy for conflict resolution.
Klisch et al (2012a)	USA	*N-Squad*	Study outcomes suggest that the game can teach standards-based science content, target age-appropriate health messages, and impact students' attitudes toward science.
Mariano, Rebouças, and Pagliuca (2013)	Brazil	*Jogando Limpo*	The game is appropriate to allow access to information on psychoactive drugs in a ludic manner.
Czuchry, Sia, and Dansereau (1997); Czuchry, Sia, and Dansereau (1999)	USA	*Downward Spiral*	The game increased students' intentions to limit alcohol consumption compared to students who were in the control group.
Khazaal et al (2008); Khazaal et al (2010); Khazaal et al (2013)	Switzerland	*Pick-Klop.*	The game improves the intention to quit smoking in patients hospitalized in a psychiatric hospital setting and in a general population of smokers.

course, the games with easier access are undoubtedly those available on the Internet.

Most games aim to teach skills and convey information. The information is mainly focused on neuroscience content. The skills training can be of two types: to reject outside influence to use drugs or to deal with stressful life situations. The games seek to transmit information without the awareness of the user, thereby increasing retention of content. This retention was confirmed in all post-match tests.

The games' target audiences are typically young people, who are perceived as individuals who get bored easily, want to engage in different activities but perform each one for only a short period, and behave in accordance with the belief that they are safe from any type of risk. These games are based on the expectation that the young users are weak, vulnerable, and have no self-esteem. The exception is *RPG Desafios*, which considered young individuals as having both

Figure: Flow chart of study selection
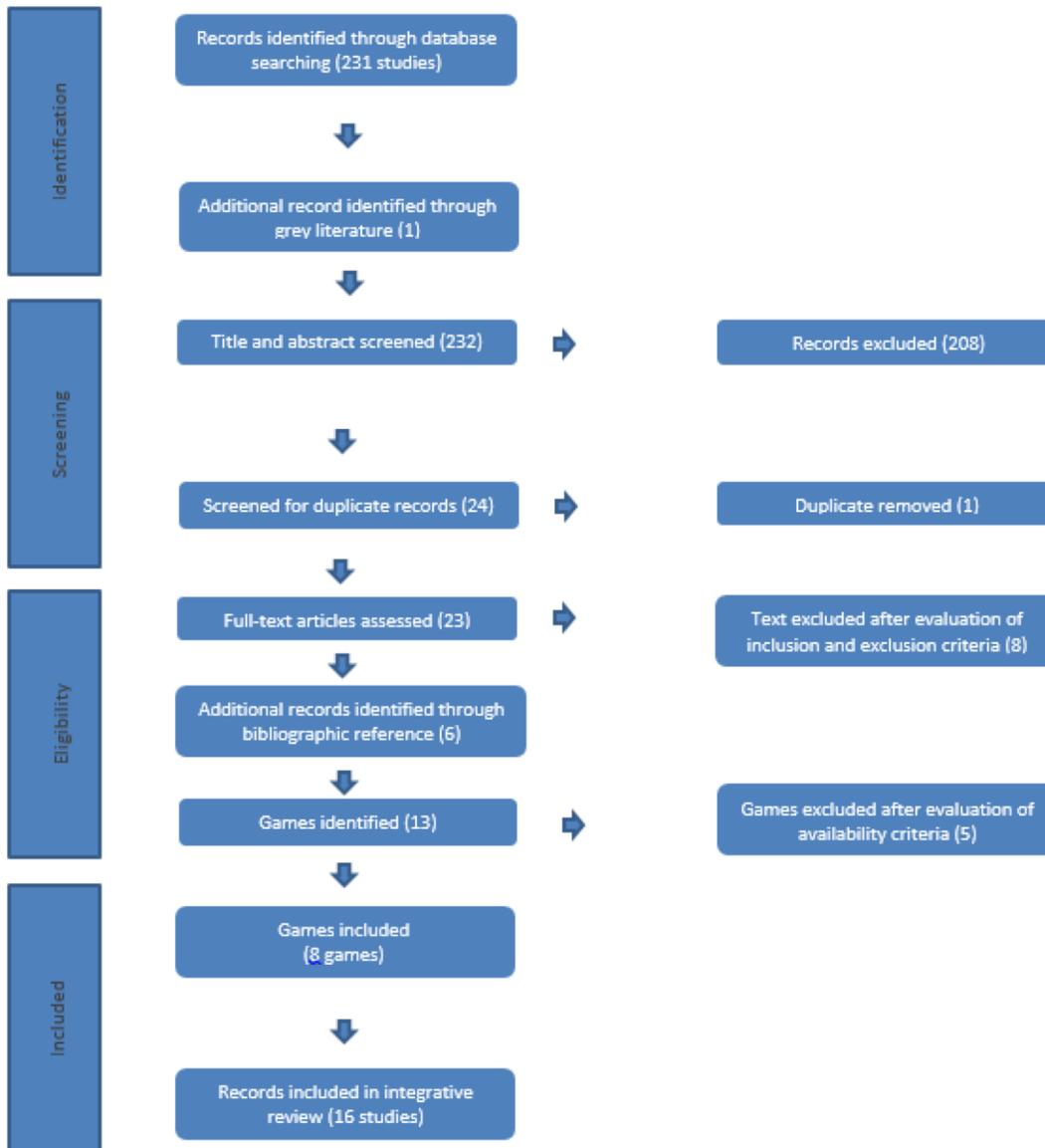
positive or negative potentials (courage, charm, health, sympathy, strength, and intelligence).

Some games create extreme and alarming contexts, depicting whole societies in danger because of a single drug (*Reconstructors*) or even death (*Downward Spiral*), while others describe more common contexts. (*RPG Desafios* and *Jogando Limpo*)

The duration of the games varies widely, but generally all of them can be played in fifteen minutes to one hour. They can be played individually (*Reconstructors, N-Squad* and *Jogo da Escolha*) or in small groups (*Downward Spiral, Pick-Klop, Jogo da Onda, RPG Desafios* and *Jogando Limpo*). Some of them promote competition between players (*Jogo da Onda, Jogando Limpo, RPG Desafios* and *Downward Spiral*).

The games encourage individual decision-making, which suggests that game creators believe that simulation produces abilities that can be transferred to real life. Some authors recommend performance eval-uation, such as monitoring content retention

during the game; for them, this would allow some self-orientation.

When fun was measured in these games, the scores were always positive. However, the game developers considered creativity to be of secondary importance; conveying information was the main goal. Creativity is limited in these games by predetermined positive or negative response choices, which reduce playability, and does not encourage critical reflection. Examples of allowing creativity in these games are the two cards that can be completed by the player in the *Jogo da Escolha* and the dramatization in the *RPG Desafios*.

Some games use dichotomous concepts, reinforcing the reductionist idea of good and evil, which is represented with images of angels and demons (*Jogo da Escolha*), or enemies and friends (*Jogando Limpo*).

Most games use cognitive behavioral theory as their theoretical basis. Game creators consider this theory consistent with constructing logical treatment strategies and focusing on the modification of dysfunctional knowledge, which can increase the risk of relapse or use. The approach emphases the management of "craving" and "trigger situations." *Reconstructors* and *Jogando Limpo* use problem-based learning (constructivist theory) and the health promotion perspective, respectively.

Only one game has harm reduction as its theoretical basis (*Jogo da Onda*), but it does not differentiate between the pragmatic and emancipatory perspectives. This game aims to create a dialogue that avoids turning into an alarmist playbook that resorts to prejudiced and universal definitions of good behavior. *Jogo da Onda* illustrates the practical realities of the population that uses drugs, as well as the socio-economic and political sides of the phenomenon.

Only two games distinguish between licit and illicit drugs (*Jogando Limpo* and *Jogo da Onda*). Most of them ignored any culture, history, economic, or policy related to drug use.

The games aim to end consumption of drugs as well as to produce negative attitudes towards illicit drugs. In this sense, they reproduce concepts and beliefs from the failed War on Drugs. Drug use is a possibility in the *RPG Desafios*, but the player loses points if he or she uses any "magic potion" (which is how drugs are represented in the game).

Discussion

The games we reviewed saw young individuals as a homogenous group. However, according to Soares (2007), youth must be understood not just based on their age; young people differ on the basis of their socio-economic status as well as their particular developmental stage.

From a collective health framework, there is a limitation to the approach found in most of these games in that they do not promote an understanding of social determination or complex issues. The cognitive-behavioral perspective shares similarities with the health promotion perspective, which, according to Stotz and Araújo (2004), focuses on monitoring social life by stipulating the acceptable behaviors to be healthy.

According to the cognitive-behavioral perspective, there is total individual autonomy in decision-making and the better choice is usually a rational, personal choice. Apparently, the game creators believe that drug users know that drug abuse can do harm, but they do not know how and why, and such knowledge would produce better decisions in life.

The cognitive-behavioral approach is affiliated with a positivist perspective of education that sees the teaching-learning process as a "banking education" which conveys simple information to an individual lacking experiences and knowledge in a way similar to how one deposits money in the bank.

Monteiro, Vargas, and Rebello (2003) argue that educational games do not replace traditional educational activities. However, most of these games seek results through isolated use, independent of other interventions. There is a false expectation that the games alone produce behavior changes.

Games can increase knowledge about drugs and the consequences linked to their use. However, according to Rodriguez, Teesson, and Newton (2014), there is no evidence that games produce abstinence or even negative attitudes toward drugs.

For Silva, Soares, and Santos (2010) the impact of harm reduction can go beyond reducing the consumption of psychoactive substances and encompass

knowledge of rights, in particular the right to health, and the reflection on how those rights may be acquired.

Such games use fun to increase motivation for learning. They suggest that education is a simple way to convey information and create values, rather than instrumentalizing an understanding of the social determination of health and human welfare.

Pasquim and Soares (2015) argue that games are not neutral as they actually seek to transmit the discourses, values, and practices of the failed War on Drugs perspective. The authors propose, from a collective health framework, that educators use games as part of the harm reduction movement to challenge myths regarding the power of drugs over young people.

The games' creators view drugs as evil in themselves, believing that the experimentation with a drug always produces addiction or abuse; they see the consumer (human) as weak and drugs (product) as an evil that must be fought. The complex process that nurtured the consumption of drugs is hidden. There is an ideological function in the games that reinforces the fetish effect of drugs. (Santos and Soares, 2013)

Alves and Araújo (2012) argue that not all games and not all styles of playing produce change in behavior, questioning the games' designs. The current researchers agree with this view. In seeking implications for practice, we suggest that, if the intention is to promote questioning and politicization of the phenomenon of drug use, *Jogo da Onda* and *RPG Desafios* should be preferred, as they allow discussion of situations and realities that involve drug use. We also suggest creating more opportunities for collective reflection and creativity, as with the blank cards in *Jogo da Onda* and the opportunity to create scenarios and characters in *RPG Desafios*. Features such as these stimulate reflection on what is at the root of consumption beyond the individual level and could promote questions such as the following: What are illicit and licit drugs? Does everyone use the same drugs? Where are drugs purchased? Are there ways to provide drug education that don't involve punishing or frightening individuals? What are the economic interests that support drug trafficking? How did drugs become such an important commodity in society?

Other games with more functionalist features, like *Reconstructors* and *N-Squad*, set out to train skills and convey information. Although limited in their ability to promote critical thinking skills, they can be helpful in providing knowledge.

Despite the limitations of the games as emancipatory tools, they show some potentialities when used as methods within an educational process to stimulate debate on the social contradictions intrinsic to the War on Drugs framework. Regarding the potentialities of digital games particularly, artificial intelligence seems to further enhance the possibility of creation and creativity.

Internationally, a type of educational game is becoming more popular. e.g. Serious Games and Applications in Health (SeGAH). These serious games generated a total of 1.5 billion euros in revenue worldwide in 2010 and offer themselves as profitable merchandise. (Idate, 2010) Serious games are digital applications that increase integration with virtual environments and link attractive resources for training and simulation in a teaching-learning process. They are aimed at a variety of sectors, such as military, corporate, government, political, religious, and healthcare. (Costa, Machado, and Moraes, 2014) However, profit seems to be a concern that runs counter to the pedagogical and therapeutic goals of educational games.

This study has some limitations related to its selection procedure. It is known that not all educational games directed at drug use among young people were studied or were described in published studies. Even so, this article has relevance, because it sheds light on multiple approaches and the ways in which they differ, providing implications for daily practice.

Conclusions

Games can help educational programs targeted toward drug users because they incorporate participants' reality and stimulate reflection, analysis, and the construction of collective opinions, while also allowing young people to overcome conceptions and practices that are incorrect. Learning is not just about memorizing warnings.

From the perspective of emancipatory harm reduction, advocated by the collective health framework, the games promoting creative experiences are likely to have greater potential as compared to the games that are intended to simply convey information.

In general, the existing educational games allow little creativity and few unexpected answers, reproducing concepts and beliefs from the failed War on Drugs. Educators can and should facilitate such experiences, but not naively or in a utilitarian way; instead, they should keep in mind that the individual's wellbeing is a more important outcome than quitting the drug itself.

We recommend the use of these games as methods to be used within a broader educational process aiming at problematizing the dominant ideology and exposing the social contradictions that surround the area of drugs worldwide.

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