Original Article

# Giracardio: educational game for the promotion of cardiovascular health in fairgrounds

# Giracardio: jogo educativo para a promoção à saúde cardiovascular em feirantes

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**ABSTRACT | OBJECTIVE:** To describe the process of elaboration of the educational game GIRACARDIO for the promotion of cardiovascular health on fairgrounds and to report the impressions of the public about the applicability of the educational technology. **METHODS:** This is a multi-method survey carried out in February 2020 at the Public Market of Sobral-Ceará, with a final sample of twenty marketers. The collection was carried out through the application of educational technology. Data treatment was carried out through thematic content analysis**. RESULTS:** There was a significant adherence by the public during the educational technology application, facilitating the moment of health education based on the healthy habits and alertness for cardiovascular risks promotion. The giracardio was configured as a facilitating instrument for teaching and learning, contributing to a health education different from the traditional ones, and pointed out the benefits of the use of educational games by nursing**. CONCLUSION:** The application of Giracardio favored teaching-learning, which led to a positive evaluation of the educational technology by the target audience. For nursing, the research added scientificity about the benefits of using light technologies in health care, with a focus on educational games.

**DESCRIPTORS:** Health education; Games. Educational technology. Health promotion. Cardiovascular Health.

**RESUMO | OBJETIVO:** Descrever o processo de elaboração do jogo educativo GIRACARDIO para a promoção à saúde cardiovascular em feirantes e relatar as impressões desse público acerca da aplicabilidade da tecnologia educativa. **MÉTODOS:** Trata-se de uma pesquisa de multimétodos, realizada no mês de fevereiro de 2020, no Mercado Público de Sobral-Ceará, com uma amostra final de vinte feirantes. A coleta realizou-se por meio da aplicação da tecnologia educativa. O tratamento dos dados se deu por meio da análise temática de conteúdo. **RESULTADOS:** Houve uma aderência significativa pelo público durante a aplicação da tecnologia educativa facilitando o momento de educação em saúde com base no favorecimento de hábitos saudáveis e alerta para riscos cardiovasculares. O giracardio configurou-se como um instrumento facilitador de ensino-aprendizagem, contribuindo para uma educação em saúde diferente das tradicionais, e apontou benefícios na utilização de jogos educativos pela enfermagem. **CONCLUSÃO:** A aplicação do Giracardio favoreceu o ensino-aprendizado, o que levou uma avaliação positiva da tecnologia educativa pelo público alvo. Para a enfermagem, a pesquisa agregou cientificidade sobre os benefícios da utilização de tecnologias leves no cuidado à saúde, com foco nos jogos educativos.

**DESCRITORES:** Educação em saúde. Jogos. Tecnologia Educacional. Promoção da Saúde. Saúde Cardiovascular.

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## Introduction

Cardiovascular Diseases (CVD) are responsible for the main causes of death in the world, and in Brazil they occupy the first place in the cause of premature death, being responsible for 29.7% of deaths in recent years. increase in Body Mass Index (BMI) and Abdominal Circumference, physical inactivity, stress, and genetic factors. In addition, systemic arterial hypertension (SAH), cigarette use, age, diabetes mellitus (DM) and altered cholesterol levels are also factors that trigger heart disease.[1-2]

In addition to the aforementioned factors, although work is considered a source of guarantee for the social reproduction of man, informal workers and their work activities stand out, in the sense of understanding how work influences their health. However, it appears that there is a gap in knowledge about how work aspects influence the process of cardiovascular disease in this population group.[3]

Due to the multiple risk factors involved in the development of CVD and its high distribution among the most exposed population groups, it is important to develop educational strategies, aiming to reduce its impacts on the health of these individuals. Thus, considering that most risk factors are associated with lifestyle, there is the possibility of implementing health actions focused on education for changes in habits.[3]

In this context, health education aims to motivate people to adopt and maintain healthy living standards, improving their health conditions.[4] Therefore, educational technologies (ET) can be important allies in this process, as they are tools used for education, in addition to enabling greater interaction with the public, approaching content according to reality, configuring itself as an easy-to-understand strategy for the lay population.[5]

Educational technologies are defined as strategies that aim to innovate education, and which have been on the agenda since 1970, when the term was already discussed by the Educational Technology Commission of the Committee on Education and Labor.[5] In addition, they are also efficient instruments in teaching, learning, communication, and expression, contributing to the emotional satisfaction of the participants.[6]

In line with the above, the ET are also added as playful strategies that facilitate the care process, contributing to the increase of self-care, empowerment, and clarification on health situations, characterizing themselves as risk prevention instruments of evident effectiveness for the promotion of protective habits to heart health.[7,8]

In that sense, nursing, being one of the main professions linked to the health education process, uses ET for health promotion, which have great relevance in health promotion, due to the ability to provide individualized attention, carry out planning and interventions, such as helping to adhere to healthy habits, with emphasis on diet, physical exercise, controlling risk factors and the correct use of medication. Thus, through educational technologies, care goes beyond the health-disease process, interfering with the biological, social, and economic factors of individuals, providing care plans within their reach, in a simplified way.[7]

The objective is to describe the process of elaboration of the educational game GIRACARDIO for the promotion of cardiovascular health on fairgrounds and to report the impressions of the public about the applicability of this educational technology.

## Methods

It is multi-method research, focusing on the construction of an Educational Technology and its application. In addition to being exploratory and descriptive research.

The study was carried out with marketers at a Public Market in the city of Sobral-CE, in February 2020. The choice of the location was based on the observation of the lack of direct health care for that population and due to the high concentration of laypeople present in the marketplace, which facilitates the dissemination of health knowledge to as many people as possible, even in their experience environment, without having to displace themselves to health institutions. The market has 280 stalls for market stalls, 60 of which are for coffee growers, and 32 external commercial outlets.[9]

The final sample consisted of 20 marketers who agreed to participate in the application of the technology. Initially, the marketers who were in all the fruit market parts of the market would be approached, but because of the pandemic situation, the collection had to be interrupted and the sample finished. As inclusion criteria, we selected those aged 18 years and over, who agreed to participate in the research. Those who started the game were interrupted by the service, and could not continue and, those who did not have the sales tent open during the collection times, were excluded.

For the construction of the Educational Technology "Giracardio", the game development phases were used, as shown in table 1.

**Table I.** Stages for game development according to Jaffe[10]

| | |
|---|---|
| Fase 1 | Describe the objectives of the game. |
| Fase 2 | Adapt to the curriculum and teaching context. |
| Fase 3 | Stimulate competition. |
| Fase 4 | Set the game rules. |
| Fase 5 | Assign the fun aspect to the game. |
| Fase 6 | The Game must provide immediate feedback from participants. |
| Fase 7 | The Game must correspond to the needs of the participants. |
| Fase 8 | Field test to eliminate errors. |
| Fase 9 | Use evaluation mechanism. |
| Fase 10 | The game must be published. |

Source: Jaffe[10], adapted by Bezerra[11] (2020).

As for the approach, the marketers were contacted in their own sales booth, were clarified about the research objectives, and signed the Free and Informed Consent Term (FICT). Eligible players were invited to play preferably in pairs with another vendor. A relaxed conversation was established to disseminate CVD prevention habits.

After the application of the game, each participant was asked: "what are your impressions about the game and its content?". The speeches were annotated and later stored in a database in Microsoft Word 2013.

Data treatment was carried out through thematic content analysis, which is divided into three phases - the first is called pre-analytic, where the material is analyzed, raising hypotheses and objectives, making a floating reading of it, and culminating in categories of analysis; the second stage is aimed at exploring the material, looking for meaningful speeches and expressions, selecting the core of the senses; the third phase deals with the discussion and interpretation of the findings, making a synthesis of the cores of meaning and interpreting them according to the literature.[12]

This study is part of umbrella research entitled "Taking care to prevent cardiovascular disease" with a favorable opinion from the Research Ethics Committee (CEP) with Human Beings, number 2,312,655.

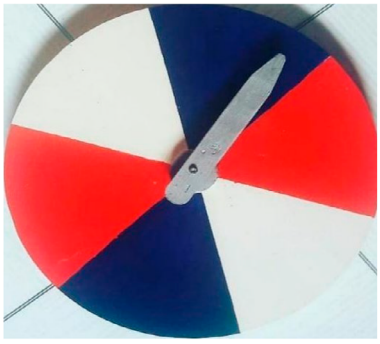
## Results

The results are divided into two topics, the first describes the construction of the ET and the second the participants' assessment of it.

### Giracardio: technology for the prevention of cardiovascular diseases

The ET Giracardio consisted of a roulette made of wood with a 13 cm radius and subdivided into six colored parts, blue, red, and white (Figure 1). The game received this name because it has a roulette wheel as its structure, and because of its content, it addresses the risks for cardiovascular diseases.

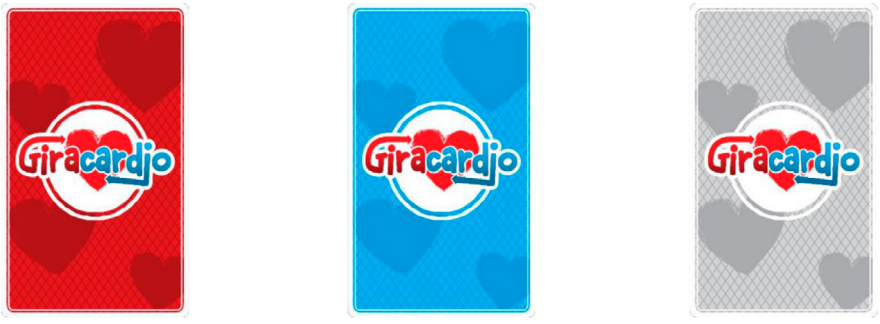
**Figure 1.** Giracardio



Source: The authors (2020).

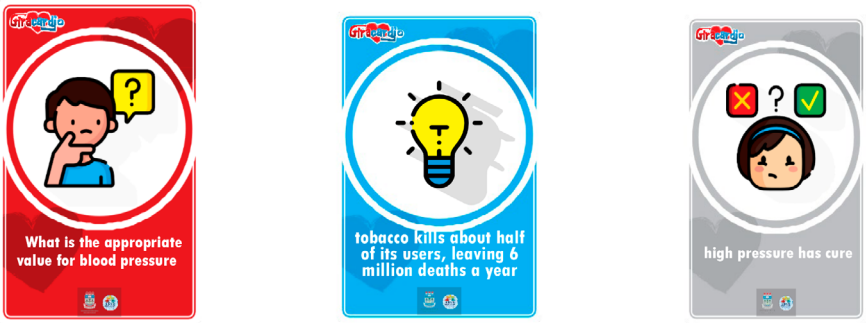
The game has 44 cards, in the same colors represented in the roulette, being 11 red, 11 blue and 22 white, corresponding respectively to three categories: questions, curiosities and assertions to judge them as true or false. The content present in the letters addresses topics related to health and cardiovascular disease, with a focus on risk factors. The letters were easily read by the vendors, although it was difficult for some to understand acronyms such as “OMS”, “AVE” and “HAS”. When situations like this occurred, the applicator explained the terms in more informal language. As for the structure, they were made on the front and back, as shown in figures 2 and 3.

**Figure 2.** Structure of the cards by categories: questions, curiosity and true or false (Back)




Source: The authors (2020).

**Figure 2.** Structure of the cards by categories: questions, curiosity and true or false (Front)




Source: The authors (2020).

Considering that in the first stage of building a game, the content must be determined, in this one, Giracardio was developed with the objective of bringing knowledge about cardiovascular disease, influencing reflection on life habits, risk factors, prevention, and curiosities on that theme.

The second stage deals with the context of public education from the game to the curriculum and, in other words, adapting to the role of nursing. Thus, the content within the game was prepared with scientific articles and sources from the World Health Organization (WHO) and the Ministry of Health. In addition, we sought to adapt the game to informal language.

The third and fourth stages discuss the stimulation of competitiveness and description of the rules of the game, respectively. Giracardio is a roulette game, divided into six parts in three colors. The beginning takes place with the roll of a die by the participants, the one with the highest number coming out in front, thus stimulating competitiveness in the game. Thus, the winner of the round spins the roulette and draws a card of the amount of the color indicated where the arrow stopped, which can be red, blue or white, representing, respectively, three axes present in the dynamics, questions, curiosities and judgment of affirmatives in true or false. If you withdraw a question or an assertion, you must answer correctly to accumulate points, if you make a mistake or don't know the answer, the question is passed on to the opponent. If none of the participants knows the answer, the game facilitator will explain the theme and the card will be discarded. When removing a curiosity card, the player automatically gains a point, and the subject is better discussed by the facilitator. For each score received, participants receive an E.V.A (Ethylene Vinyl Acetate) heart, for counting the points at the end.

The fifth stage deals with the fun aspect that the game must provide to the participants. Giracardio provides fun through its format, leading players to learn through play. And in the sixth stage, the game must give immediate feedback. The return to the participant is made possible by the game's own methodology, as there is space for discussion during the matches, and with the emergence of doubts, a dialogue was opened with the applicator to resolve them.

In the seventh stage, which must correspond to the needs of the participants, it is understood that Giracardio provided the public with knowledge about CVDs and their risks, clarifying questions and enabling discussions that influence the construction of preventive habits.

In the eighth stage, the game must be field tested. Field testing is necessary to ensure the effectiveness of the game, avoiding errors during its application.[11] For this, the game was exposed to a scientific event - the I Sobralense Meeting for the Promotion of Cardiovascular Health (I PROMOCARDIO), where it was applied with nursing students from the Universidade Estadual Vale do Acaraú, students from other areas of health present and nursing professionals, which allowed the identification of some adjustments.

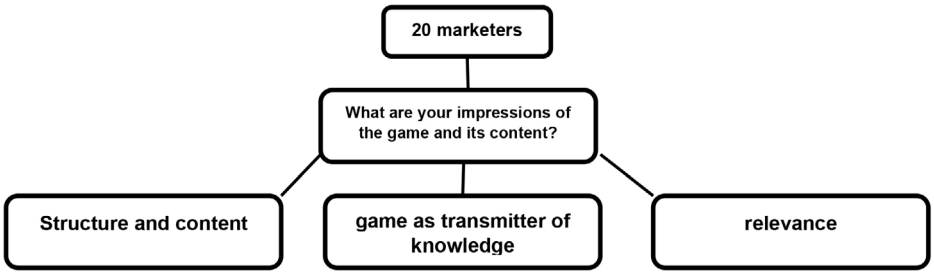
Considering the recommendations made, some points were modified. First, the decision of who started the match was a consensus among the competitors, so it was advised to use data for the decision. Furthermore, the number of cards used was touched on, at first there were 60 cards, throughout the exhibition it was indicated to reduce the number and condensation of themes that were redundant, in addition the model should be improved to make them more playful. Another point mentioned was the number of rounds, which should be stipulated by the applicator, considering the environment in which the game would be applied and the number of people participating, seeking to provide entertainment to the public and not make the experience tiring.

For the ninth stage, an evaluation mechanism must be used. In this sense, after applying the game, participants were asked about the contributions of ET to health knowledge. To conclude with the tenth stage, which establishes that the game is published, Giracardio was presented as a scientific work at the following events held in Sobral-CE: at the II International Health and Society Congress, which took place from September 4th to 6th, 2019 and at the XXI Scientific Initiation Meeting of the Universidade Estadual Vale do Acaraú, held from October 10 to 11, 2019.

Initially, there was an articulation for the participation of fairground marketers with nearby stalls, facilitating the activity for both and complying with the rules of the game, which establishes the participation in pairs. If there was no agreement, the game was played individually.

The rules were explained during the approach, as well as the objectives of the game. The applicator inquired about the emergence of doubts about the game and with the consent of the fairground, the rounds were started. During the application, fun and interaction between the marketers with the facilitator were perceived. At the end of the application, they were asked about their impressions of the game and the content, and if they considered it important. Thus, three cores of meaning emerged from the response of the marketers, as shown in Figure 4:

**Figure 4**. Nuclei of meaning found from the response of marketers




Source: The authors (2020).

As for the structure of the game and its content, the positive evaluation is perceived in the following lines:

*It's cool, the colors attract attention, the roulette wheel is very creative. (F18)*
*The game was great, very good. (F9)*
*We never had this little game here, I liked it. (F17)*
*I think it was important, right, because what is really at stake there is the reality of health, of the Brazilian population. (F10)*

In other lines, there is a demonstration of the role of the game as a transmitter of knowledge:

*High blood pressure is silent, I didn't know. The game warned me about this. (F4)*
*For example, I didn't know that high blood pressure even harmed the kidneys too, now I know. (F7)*
*I didn't know that, that stress harmed the heart. (F13)*

For other research participants, the game served to reflect on their self-care habits:

> *We don't care about our health, while we're not feeling anything, we're working getting up early, but when the body asks for it... that's it [...] That's why it's good to have this alert, this game helps with that. (F6)*

Other participants, on the other hand, presented knowledge about the topics covered, but attributed relevance to the game:

> *I already knew about the information that came out in the game, but there are people who don't know. It is important to alert others. (F5)*
> *My mother had a stroke, because of high blood pressure, I already knew that [...] It serves to alert people who don't know about it. (F11)*

## Discussion

Regarding what was presented, educational interventions in groups, in the workplace and at lunchtime, are shown to be an effective strategy to increase knowledge about risk factors for CVD.[14]

In this perspective, a study concluded that the educational intervention, of the educational game type, contributes significantly to the increase of participants' knowledge about the content addressed in their intervention.[15] In addition, educational games are endowed with motivating functions and teaching strategies, characterized by having important functions for the education and development of knowledge in any age group.[16] Thus, based on the statements previously presented in the results, Giracardio presented itself as a playful tool, capable of attracting the public's attention and generating interest, in addition to the content representing the reality experienced by the participants.

TEs, such as board games, in learning scenarios, can arouse motivation, curiosity and interest in learning, stimulating the resolution of situations that require autonomy.[17] In short, ETs contribute to changes in life habits, health promotion and CVD prevention, as well as directly influencing the absorption of new knowledge and promoting reflection and awareness in a playful and dynamic way.[18]

A study carried out at the Bahia Municipal Market defends the need for health education activities with market workers, lay people, with the objective of raising awareness about preventive measures and the control of chronic diseases, through future health problems.[19]

Although some marketers showed an understanding of the themes addressed in Giracardio, others were surprised by the information obtained. Therefore, ET proved to be an effective tool in conversation with the public, providing knowledge about cardiovascular disease and measures to prevent it.[6] This statement is also observed regarding the effectiveness of the educational contribution of ETs, in the process of health rehabilitation, fixation of information and change in life habits.[7]

Thus, the effectiveness in carrying out health promotion actions that directly influence the improvement of the population's conditions seems to be due to the way in which they are carried out. In these actions, individuals take advantage of the moment to ask questions that they often do not have the opportunity to during a consultation, in addition to often having difficulties in accessing information. From educational moments, it is possible to establish effective dialogues and the construction of knowledge, through the clarification of recurring doubts and the knowledge addressed by health professionals.[20]

In this approach, Giracardio was configured as a teaching-learning facilitator instrument, having made possible the bond with the market marketers and contributing to a health education different from traditional techniques, such as lectures and conversation circles. The playfulness attributed to the game proved to be an important educational strategy to draw the public's attention and make room for teaching. It is worth mentioning that the approach was carried out during working hours and even so, many participants made room to collaborate with the action.

For nursing, ET can be considered an important strategy in the planning of health actions, considering the social and economic impact caused by CVD and the role of nurses as health educators.[21]

In this context, a study points to the benefits of the use of educational games by nursing. emphasizing the possibility of providing humanized care, in addition to the contribution to nursing care being carried out scientifically, causing positive impacts on health care.[22]

As a limitation of the study, there was a small number of samples, which was made impossible by the beginning of the new coronavirus pandemic. In addition, the environment often did not favor the application of ET, due to the internal and external noise of the fair, as well as the lack of time at the fairground due to sales, which made it impossible to concentrate during the game.

## Final considerations

Giracardio proved to be an ally in raising awareness about the importance of healthy habits to the marketers who participated in this research and showing them the risks to which they are exposed. The game covered the CVD health education needs those laypeople need, acting as an awareness-raising agent about cardiovascular health, which led to a positive evaluation of the technology by the target audience.

It was observed that the use of the game made it possible to build a bond with the population, which can be an important tool for nurses in their work practice when carrying out health education since the use of play calls attention and favors greater opportunity for exchange of knowledge between nurses and the community in an interactive and fun way.

The study serves as an induction for new research that seeks the benefits of ET as facilitators of health education aimed at the public.


### Authors' contributions

Santos LTS participated in the conception, design, search, and statistical analysis of research data, collection, interpretation of results, and writing of the scientific article. Frota KC and Ponte KMA participated in the conception, design, and writing of the scientific article. Souza FDC participated in data collection and writing of the scientific article.

### Conflict of interests

No financial, legal, or political conflicts involving third parties (government, companies, private foundations, etc.) were declared for any aspect of the submitted work (including, but not limited to grants and funding, participation in an advisory board, study design, preparation manuscript, statistical analysis, etc.).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