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GAMIFICATION IN FIRST AID TEACHING BY NURSING UNDERGRADUATES TO HIGH SCHOOL ADOLESCENTS: AN EXPERIENCE REPORT

GAMIFICAÇÃO NO ENSINO DE PRIMEIROS SOCORROS POR GRADUANDOS DE ENFERMAGEM A ADOLESCENTES DO ENSINO MÉDIO: RELATO DE EXPERIÊNCIA

GAMIFICACIÓN EN LA ENSEÑANZA DE PRIMEROS AUXILIOS POR ESTUDIANTES DE ENFERMERÍA A ADOLESCENTES DE EDUCACIÓN SECUNDARIA: RELATO DE EXPERIENCIA

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ABSTRACT

Gamification has stood out as an innovative methodology in health education, promoting engagement and active learning among adolescents. In first aid education, its application can enhance the understanding of emergency procedures and strengthen a culture of prevention. This study aims to report the experience of nursing students in implementing a gamified educational strategy for teaching first aid to high school adolescents. This is a descriptive study, in the form of an experience report, conducted in a public school in Guarulhos (SP) with 319 students aged 15 to 17 years. The intervention involved a dialogued expository class, an interactive quiz, and a digital questionnaire via Forms. High levels of engagement, interest in the topic, and a noticeable improvement in knowledge about first aid procedures were observed, especially in cases of cardiac arrest, seizures, and choking. Gamification proved to be an effective, dynamic, and participatory tool, promoting meaningful learning and encouraging self-care and preventive attitudes among adolescents.

KEYWORDS: *Adolescent Health. First Aid. Educational Technology. Health Education. Gamification.*

RESUMO

A gamificação tem se destacado como metodologia inovadora na educação em saúde, favorecendo o engajamento e o aprendizado ativo entre adolescentes. No ensino de primeiros socorros, sua aplicação pode ampliar a compreensão sobre condutas de emergência e fortalecer a cultura de prevenção. O presente estudo objetiva relatar a experiência de discentes de enfermagem na aplicação de estratégia educacional gamificada para o ensino de primeiros socorros a adolescentes do ensino médio. Estudo descritivo, tipo relato de experiência, realizado em escola pública de Guarulhos (SP) com 319 alunos entre 15 e 17 anos. A intervenção envolveu aula expositiva dialogada, quiz interativo e questionário digital via Forms. Observou-se elevado engajamento, interesse pelo tema e melhora perceptível no conhecimento sobre condutas de

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primeiros socorros, especialmente em PCR, convulsões e engasgo. A gamificação demonstrou ser uma ferramenta eficaz, dinâmica e participativa, promovendo aprendizado significativo e estimulando atitudes de autocuidado e prevenção entre adolescentes.

PALAVRAS-CHAVE: Saúde do Adolescente. Primeiros Socorros. Tecnologia Educacional em Saúde. Educação em Saúde. Gamificação.

RESUMEN
La gamificación se ha destacado como una metodología innovadora en la educación en salud, favoreciendo el compromiso y el aprendizaje activo entre adolescentes. En la enseñanza de primeros auxilios, su aplicación puede ampliar la comprensión sobre conductas de emergencia y fortalecer la cultura de prevención. El presente estudio tiene como objetivo relatar la experiencia de estudiantes de enfermería en la aplicación de una estrategia educativa gamificada para la enseñanza de primeros auxilios a adolescentes de educación secundaria. Se trata de un estudio descriptivo, tipo relato de experiencia, realizado en una escuela pública de Guarulhos (SP) con 319 estudiantes entre 15 y 17 años. La intervención incluyó una clase expositiva dialogada, un cuestionario interactivo (quiz) y un cuestionario digital a través de Forms. Se observó un alto nivel de compromiso, interés por el tema y una mejora perceptible en el conocimiento sobre conductas de primeros auxilios, especialmente en paro cardiorrespiratorio, convulsiones y atragantamiento. La gamificación demostró ser una herramienta eficaz, dinámica y participativa, promoviendo un aprendizaje significativo y fomentando actitudes de autocuidado y prevención entre los adolescentes.

PALABRAS CLAVE*: Salud del Adolescente. Primeros Auxilios. Tecnología Educativa en Salud. Educación en Salud. Gamificación.*

INTRODUCTION

Health education is an essential element in promoting well-being and preventing health problems, especially among children and adolescents1. Learning healthy habits from childhood and adolescence is a fundamental strategy for developing beneficial practices and acquiring skills that enable rapid and effective responses, particularly in emergency situations. However, traditional teaching methods often face challenges in engaging students, becoming less attractive and limiting knowledge retention [2,3].

In recent years, gamification has emerged as an innovative and effective approach to health education, making learning more dynamic, interactive, and engaging. Defined as the application of game elements in non-game contexts, gamification has demonstrated positive impacts on motivation, knowledge retention, and adherence to taught practices[4]. Recent evidence indicates that serious digital games aimed at health promotion, as demonstrated by international meta-analyses, have produced significant results in behavior change and health learning among adolescents, reinforcing the potential of this strategy in school settings[5].

This methodological teaching approach has been widely used in several areas, including health education, due to its potential to enhance learning and facilitate the practical application of

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acquired knowledge[2,6]. The main benefits of this teaching strategy include increased student engagement, as the introduction of challenges and rewards encourages active participation in the educational process. Furthermore, studies indicate that this methodology contributes to knowledge retention, especially in teaching complex content, by promoting experiential learning. It also fosters the development of critical thinking and problem-solving skills, which are essential for professional practice, particularly in healthcare fields [2,4,7-9].

However, its effectiveness depends on proper implementation, considering the specificities of the educational context and the individual characteristics of students. Challenges such as adapting gamified activities and maintaining student interest over time must be evaluated to ensure that the strategy achieves its pedagogical objectives[4].

Knowledge about cardiopulmonary arrest (CPA) and first aid is essential to increase survival chances in emergency situations. CPA is one of the leading causes of sudden death worldwide, and a rapid and appropriate response can double or even triple the victim's survival rate. In addition, first aid education enhances the general population's ability to deal with emergencies, preventing complications and reducing the severity of injuries before healthcare services arrive [2,3,10].

Therefore, the inclusion of educational programs on first aid in high school education is a strategy to create a culture of prevention and preparedness, making individuals more capable of acting appropriately in critical situations. In this context, the aim of this study was to report the experience of undergraduate students in implementing a gamified educational strategy for teaching first aid in high school education.

MATERIALS AND METHODS

This is a descriptive qualitative experience report study. The educational activities involved 318 high school students aged between 15 and 17 years from a public school located in the municipality of Guarulhos.

The activities took place as part of the extension project of the undergraduate nursing program at a private university in the municipality of Guarulhos. They were designed and implemented by a professor and fourth-semester nursing undergraduate students. The educational activities occurred on October 17, 2024, and each session lasted 1 hour and 30 minutes. A total of five sessions were conducted to include all high school classes at the school.

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All adolescents enrolled in the school, aged between 15 and 17 years and present on the date of the activities, were included in the educational activities. Children and adolescents of other age groups who were not enrolled in high school on the date of the activity, as well as adolescents who were absent from school on that date, were excluded.

Stages of the Educational Strategies

The structuring of the gamified activities was based on the framework proposed by Kevin Werbach and Dan Hunter¹¹, which categorizes game elements into three levels: dynamics (narrative, competition), mechanics (scoring, feedback), and components (badges, rankings). In this intervention, the following were implemented: scoring (assignment of symbolic correct answers during the quiz, with immediate rewards), competition (encouraging individual participation through public recognition), and immediate feedback (instant corrective responses during the quiz and automatic performance reports sent by e-mail after the questionnaire). This structure sought to maximize intrinsic motivation through rapid challenge–reward cycles, aligning with the premise that playful elements enhance cognitive retention in educational contexts.

The educational strategies implemented in the study were divided into three main stages in order to ensure participant engagement and the progressive assimilation of content:

1. Dialogic Expository Class: The first stage consisted of a dialogic expository class developed and delivered by nursing students on the topic “First Aid,” based on the recommendations of the American Heart Association¹² and the Sociedade Brasileira de Pediatria¹³. The content covered included cardiopulmonary arrest (CPA), seizure management, foreign body airway obstruction (FBAO), electric shock, and drowning. During the class, visual material created using Canva was projected in the auditorium via Datashow.
2. Interactive Quiz Game Activity: In the second stage, a question-and-answer quiz called “Young in Action” was applied. The quiz consisted of 14 questions related to the topics addressed and was also developed using Canva and projected in the auditorium via Datashow. Adolescents who wished to answer the questions were invited to the front of the auditorium to speak into the microphone, and those who answered correctly received a symbolic gift.
3. Application of a Digital Questionnaire: The third and final stage involved the application of a questionnaire consisting of eight multiple-choice questions, each containing three alternatives with only one correct answer. The questionnaire was developed using Google Forms. For its application, the instructors provided a QR code projected via Datashow, allowing adolescents to access the

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questionnaire. At the end of completion and submission, students received their percentage of correct answers and the correct responses by e-mail.

Role of Nursing Students

The nursing students participated as instructors and facilitators of the activities, carrying out stages 1, 2, and 3. Thus, they played an essential role in mediating theoretical knowledge, conducting playful activities, supervising learning, and promoting participant engagement. This involvement ensured active, reflective, and meaningful assimilation of concepts related to cardiopulmonary arrest and first aid, strengthening knowledge construction and the practical applicability of the content.

Data Analysis Method

Qualitative data were analyzed through observation of adolescents' involvement in the activities, the questions and reflections generated during the activities, and the responses submitted in the multiple-choice questionnaire.

Ethical Principles

This study is characterized as an experience report and does not constitute research with a systematic methodological design aimed at producing generalizable knowledge, in accordance with the guidelines of the Comissão Nacional de Ética em Pesquisa and the Conselho Nacional de Saúde, especially the provisions established in Resolution CNS No. 466/2012.

RESULTS

The participants in this study were 319 adolescents regularly enrolled in high school at a public state school in the municipality of Guarulhos, São Paulo, aged between 15 and 17 years. Of the total, 179 were first-year students, 62 were second-year students, and 78 were third-year students, thus encompassing different stages of the high school educational cycle. The participants were predominantly adolescents without prior structured training in first aid, which could be inferred both from spontaneous reports of lack of knowledge regarding emergency conduct and from the questions raised throughout the educational activities.

For the first aid educational proposal, a dialogic expository class lasting approximately one hour was initially conducted by undergraduate nursing students and instructors on the topic "First Aid." The class content included recognition and management of cardiopulmonary arrest

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(CPA), seizure management, foreign body airway obstruction (FBAO), electric shock, and drowning.

After the dialogic expository class, the students participated in the quiz activity. The students answered the quiz questions individually. In order to "win" the symbolic gift, the adolescent had to go first to the front of the auditorium and provide their answer using the microphone. If the answer was correct, the participant received a symbolic prize. The average duration of this stage was 30 minutes (Figure 1).



Source: Prepared by the authors. Image of the quiz questions.

Figure 1. Images captured during the implementation of the quiz activity.

After the completion of the quiz activity, the QR code was projected. A total of 319 students accessed and answered the multiple-choice questions using their mobile phones. After submitting their responses, each student received in their personal e-mail inbox the percentage of correct answers as well as the appropriate responses for each first aid situation.

DISCUSSION

Gamification has been widely recognized as an innovative approach in health education, promoting greater engagement, knowledge retention, and active learning[2]. Furthermore, when well-structured, gamified activities foster increased student interest and commitment[7].

In the present study, the combination of a dialogic expository lecture, interactive quiz, and structured digital questionnaire enabled the integration of theoretical exposition, collective reflection, and knowledge assessment, constituting a dynamic, student-centered educational intervention. This structure is aligned with findings from systematic reviews that identify

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gamification as an effective resource for promoting active learning, content retention, and the development of higher-order cognitive skills, such as critical thinking and decision-making in emergency situations[2,8,9].

Regarding the impact on knowledge and practical applicability, knowledge retention can be perceived as an essential factor in first aid education, especially considering the importance of rapid and effective responses to emergencies such as cardiac arrest[3].

The participants were predominantly adolescents without previous structured training in first aid, as evidenced by spontaneous reports of unfamiliarity with appropriate emergency procedures and by the questions raised during the educational activities. This profile characterizes a typical target audience for school-based health education actions, in a critical stage of cognitive development and autonomy in decision-making, reinforcing the relevance of implementing innovative pedagogical strategies, such as gamification, aimed at first aid training and the promotion of a culture of injury prevention among adolescents.

In the present study, the methodology employed allowed students to internalize theoretical concepts and apply them more effectively, reinforcing the importance of practical learning. Evidence suggests that gamification, when combined with neuroscience-based strategies and cognitive behavioral therapy, may enhance the assimilation and application of learned content[2].

The involvement of nursing students as instructors and facilitators constitutes another relevant aspect of this experience. By assuming a leading role in conducting the activity — from preparing educational materials, developing the quiz, and organizing logistical aspects, to mediating direct interaction with adolescents — undergraduate students experienced a formative process that extends beyond traditional teaching. The literature in nursing education highlights that active methodologies and extension experiences bring students closer to real-life situations, favoring the development of pedagogical, communicational, and leadership competencies, with a positive impact on critical-reflective training[2,6,7]. In the present study, gamification functioned not only as a tool for teaching adolescents, but also as a means of consolidating essential skills for nursing students' performance in health education.

Observations conducted during the activities also revealed that many adolescents had limited prior knowledge and misconceptions regarding appropriate conduct in emergency situations, especially in cases of cardiac arrest, seizures, electric shock, choking, and drowning. This finding is consistent with the results of Fijačko et al.[3,8], who identified important gaps in children's and adolescents' knowledge of basic life support, as well as variability in the quality of educational content available in applications and digital materials.

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At the end of the activities, an improvement in participants' understanding could be observed, reflected both in greater confidence when describing appropriate procedures and in active participation during the quiz and the resolution of multiple-choice questions.

Another aspect to be considered concerns the choice of a digital format for the multiple-choice questionnaire (Google Forms accessed via QR Code). The adoption of technological resources familiar to adolescents' daily lives favored adherence to the activity and enhanced interaction with the content, in line with studies indicating that the integration of digital technologies and gamification is an effective strategy for expanding the reach of health education among young people[3,9,10]. Immediate feedback sent by email, including the percentage of correct answers and the correct responses, contributed to self-regulated learning, enabling students to identify gaps in their knowledge and review fundamental first aid concepts.

Despite the favorable results, some limitations should be acknowledged. The study was conducted in a single public school using a convenience sample, which restricts the generalization of the findings to other educational contexts. In addition, this experience report was not intended to quantify the degree of learning among elementary school or undergraduate nursing students, requiring other research designs for this purpose. Another limitation was the absence of an evaluation of medium- and long-term knowledge retention, as well as the impact of the intervention on students' practical performance in simulated emergency situations.

These limitations highlight the need for future studies with more robust designs, including pre- and post-intervention assessments, longitudinal follow-up, and, whenever possible, comparisons with control groups exposed to traditional methodologies.

Nevertheless, as an experience report, the present study offers relevant contributions by demonstrating the feasibility and potential of gamification as a health education strategy in the school environment, while also highlighting the formative role of the active participation of undergraduate nursing students in extension projects.

CONSIDERATIONS

The present study demonstrated that gamification applied to first aid education is an effective pedagogical strategy for adolescent health education, promoting active engagement, meaningful learning, and participant satisfaction. The approach combined elements of competition, scoring, and immediate feedback, which showed a positive impact on motivation and knowledge retention. The experience provided adolescents with a concrete opportunity to learn about appropriate conduct in emergency situations, fostering the development of essential competencies for safe action in critical events.

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The participation of undergraduate nursing students as mediators was equally significant, consolidating experiential learning and the development of pedagogical, communicational, and leadership skills. This extension experience reaffirms the importance of integrating teaching, research, and extension activities in nursing education, connecting scientific knowledge with socially transformative practice.

However, it is recognized that the study presents limitations inherent to the experience report design and the single context in which it was conducted, preventing generalizations. Therefore, future research is recommended.

Nevertheless, gamification demonstrated the potential to make the teaching-learning process more interactive, participatory, and contextualized, expanding the reach of school-based health education actions and strengthening the social role of nursing in the education of more prepared, aware, and capable citizens who can respond safely to emergency situations.

REFERENCES

1. Feio A, Oliveira CC. Confluências e divergências conceituais em educação em saúde. Saúde Soc. 2015;24(2):703-15.

2. Dos Santos TT, Ríos MP, de Medeiros G, Mata ÁNS, Silva Junior DDN, Guillen DM, et al. Gamification as a health education strategy of adolescents at school: protocol for a systematic review and meta-analysis. PLoS One. 2023;18(11):e0294894.

3. Fijačko N, Masterson Creber R, Gosak L, Štiglic G, Egan D, Chaka B, et al. Evaluating quality, usability, evidence-based content, and gamification features in mobile learning apps designed to teach children basic life support: systematic search in app stores and content analysis. JMIR Mhealth Uhealth. 2021;9(7):e25437.

4. Oliveira JF, Silva MP, Santos LF. Efetividade do uso da gamificação na educação em saúde. RECIMA21. 2021;2(6):e26422.

5. DeSmet A, Van Ryckeghem D, Compernolle S, Baranowski T, Thompson D, Crombez G, et al. A meta-analysis of serious digital games for healthy lifestyle promotion. Prev Med. 2014;69:95-107.

6. Silva RJR, Rodrigues RG, Leal CTP. Gamification in management education: a systematic literature review. Braz Adm Rev. 2019;16(1):e180098.

7. Flores-Aguilar G, Prat-Grau M, Fernández-Gavira J, Muñoz-Llerena A. “I learned more because I became more involved”: teachers’ and students’ voice on gamification in physical education teacher education. Int J Environ Res Public Health. 2023;20(4):2895.

8. Fijačko N, Masterson Creber R, Gosak L, Štiglic G, Skok P, Greif R. Teaching children and adolescents basic life support using gamification. Resuscitation. 2021;169:20-22.

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9. Suleiman-Martos N, García-Lara RA, Martos-Cabrera MB, Albendín-García L, Romero-Béjar JL, Cañadas-De la Fuente GA, et al. Gamification for the improvement of diet, nutritional habits, and body composition in children and adolescents: a systematic review and meta-analysis. Nutrients. 2021;13(7):2478.

10. Gkintoni E, Vantaraki F, Skoulidi C, Anastassopoulos P, Vantarakis A. Gamified health promotion in schools: the integration of neuropsychological aspects and cognitive behavioral therapy—a systematic review. Medicina (Kaunas). 2024;60(12):1942.

11. Werbach K, Hunter D. For the win: how game thinking can revolutionize your business. Philadelphia: Wharton School Press; 2012.

12. Lavonas EJ, Magid DJ, Aziz K, Berg KM, Cheng A, Hoover AV, et al. Highlights of the 2020 American Heart Association guidelines for CPR and ECC. Dallas: American Heart Association; 2020.

13. Sociedade Brasileira de Pediatria. Novas recomendações para parada cardiorrespiratória (RCP) em pediatria: guia da American Heart Association (AHA) 2020. Rio de Janeiro: Sociedade Brasileira de Pediatria; 2020.

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