Malaysian Journal of Social Sciences and Humanities (MJSSH) (e-ISSN : 2504-8562)
2022, Volume 7, Issue 8, e001690
DOI: https://doi.org/10.47405/mjssh.v7i8.1690

Board Game for School Health Education: The Development Process

Nurul Azmawati Mohamed[1*], Shalinawati Ramli[2], Mohd Dzulkhairi Mohd Rani[3], Azman Ab Rahman[4]

[1]Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, 7800 Nilai, Negeri Sembilan, Malaysia.
Email: drnurul@usim.edu.my
[2]Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, 7800 Nilai, Negeri Sembilan, Malaysia.
Email: shalinawati@usim.edu.my
[3]Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, 7800 Nilai, Negeri Sembilan, Malaysia.
Email: drdzulkhairi@usim.edu.my
[4]Faculty of Law and Syariah, Universiti Sains Islam Malaysia, 7800 Nilai, Negeri Sembilan, Malaysia.
Email: azman@usim.edu.my

CORRESPONDING AUTHOR (*):
Nurul Azmawati Mohamed (drnurul@usim.edu.my)

KEYWORDS:
Boardgame
Health education
Edutainment

CITATION:
Nurul Azmawati Mohamed et al. (2022). Board Game for School Health Education: The Development Process. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 7*(8), e001690. https://doi.org/10.47405/mjssh.v7i8.1690

ABSTRACT

Health education in schools is crucial in helping students to develop awareness, skills, and positive attitudes towards health. It assists students to improve and preserve their health, prevent illness, and avoid risky behaviors. It focuses on promoting learning skills that will help students understand the importance of their own health needs along with those of their families and communities. These abilities of learning skill ultimately provide the foundation for educating them how to advocate for their own well-being throughout their lives. The term "edutainment" describes the blending of education and entertainment. It could be in the form of media, games, toys, and experiences that mix fun and learning to motivate students. Among others, board game is considered suitable as a supportive tool for health education teaching in school. This paper discusses health education in schools and ideas of developing a game to improve health education delivery in schools.

Contribution/Originality: This paper originates new idea on how health edutainment for children could be done.

1. Introduction

Health education, according to the World Health Organization (WHO), is defined as "*consciously constructed opportunities for learning involving some form of communication designed to improve health literacy, including improving knowledge and developing life skills that are conducive to individual and community health*" (WHO, 1998). Health education among children and adolescents has been given high priority in many countries, especially health-related behaviors such as smoking. School health education has been identified as one of the important elements in modifying the school determinants of

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children's health. The term "edutainment" describes the blending of education and entertainment. It could be in the form of media, games, toys, and experiences that mix fun and learning to motivate students. Each form has their own advantages and disadvantages. This paper discusses health education in schools and ideas of developing a game to improve health education delivery in schools.

2. Literature Review

2.1. Health Education in Schools

Health education in schools is crucial in helping students to develop awareness, skills, and positive attitudes towards health. It assists students to improve and preserve their health, prevent illness, and avoid risky behaviors. Inculcating the value of health in schools allows students to make healthier decisions as they grow older and continue the same throughout their lives. According to the WHO, health education is important in preparing students with the right knowledge to create an awareness that everyone shares responsibilities to protect their own health to reduce incidences of disease, disability, and death (Hahn & Truman, 2015). School health education has been identified as one of the important elements in modifying the school determinants of children's health (Lowry et al., 2022).

In Malaysia, basic knowledge about the human body and human health are taught in science as well as physical and health subjects. Most of the time, the topics are delivered in the classroom through traditional methods, for example presentation and discussion. Apart from that, the Ministry of Health Malaysia also actively promotes healthy lifestyle through HePiLi (Health Promotion in Learning Institutions) project that consists of four main programs: Kelab Tunas Muda (Very Young Doctor) for kindergarten, *Doktor Muda* (Young Doctor) for primary schools, PEARL for adolescents in secondary schools and PROSIS for students in the higher learning institutions (MOH, n.d.).

2.2. Important of Health Education in Schools

A study in Nigeria showed that stroke awareness was improved after health talk and flyers distribution in the schools (Komolafe, Olorunmoteni, & Fehintola, 2020). Educating adolescents on stroke warning signs and risk factors may help in improving stroke prevention, early diagnosis and early hospital presentation, with an eventual reduction in stroke incidence and mortality. Research showed that well-designed and well-implemented school health program can directly affect many health outcomes, such as reducing sexual risk behaviours related to HIV, sexually transmitted diseases (STDs), and unintended pregnancy, reducing substance and tobacco use, and improving academic performance.

2.3. Concept of Edutainment

It is used to teach students how to use their own knowledge by analysing what they learn, combining what they perceive, or assessing what they learn (Charsky, 2010). Students benefit from the edutainment approach by having fun while learning about how to create, use information resources, and interact with each other. It is possible to boost students' interest and excitement in order to teach them knowledge and subjects that are challenging to learn. By grabbing students' attention and making the material and concepts being taught more engaging, teaching can be made easier.

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A total of 360 children aged 8-9 years from three schools were involved in an oral health related study in India. Each school was randomly allocated with a mode (drama, modified snake and ladder game and flash card) for 20 minutes, every 6 months for 2 years. Results showed that all the three modes were effective in improving the oral health related behaviour of school children. Game mode made a better impact on the knowledge scores of these children, and it was observed to be more child-friendly and entertaining (GeethaPriya et al., 2020). Contrary, in Portugal edutainment in the form of TV series about healthy food was not effective. The results showed that most children liked the episode and thought it was fun. However, there were no significant changes in the children's preferences and spontaneous food selection toward healthy food after watching the episode of Nutri Ventures (Sintra & Agante, 2020).

2.4. Games

Games are one technique to foster more engaging interactions that have been demonstrated to boost knowledge and enhance conduct. Games can promote play and fantasy, two crucial techniques for improved attentional control, better learning, and assisting kids in understanding how their current actions may affect their future (Nijhof et al., 2018). A game is a kind of play in which players adhere to predetermined rules. Games may be used as an additional tool to assist conventional teaching techniques to enhance the learning experience for students and teach additional skills including adhering to rules, adapting, problem-solving, interaction, critical thinking, creativity, collaboration, and good sportsmanship. Domínguez et al. (2013) stated the application of gaming features in non-entertainment circumstances is gaining popularity in education (Domínguez et al., 2013).

Games can be divided into two categories: serious games and digital games. The primary goal of serious games, which are frequently used in education, is to transmit professional and life skills. Serious games can support instructional practices to increase student engagement and pleasure and are effective teaching aids for learning knowledge and skills. According to research on serious games, these games assist kids in developing their cognitive abilities, understanding concepts holistically, and encourage motivation, enhance learning outcomes, encourage sociocultural learning, have a positive attitude-changing effect on pupils, provide flexible learning possibilities, draw players' attention, change their behaviour, and allow for numerous learning outcomes (Calvo-Morata et al., 2021).

2.5. Board Games

A board game is any game played by putting, moving, or removing pieces on a board using a game structure in which pieces are moved in certain ways on a board designated with a pattern (Noda, Shirotsuki, & Nakao, 2019). The greatest benefits of board games are enhanced communication and active learning based on player involvement. Playing board games involves moving game pieces in specific ways on specific boards that have patterns on them. When playing board games, people may also interact nonverbally, and players are more inclined to get together and take part in an enjoyable activity with others. These elements might strengthen people's social networks, which also guards against cognitive deterioration (Nakao, 2019). A review among 11 studies that utilized board games to increase knowledge showed that, as a tool, board games can be expected to improve the understanding of knowledge, enhance interpersonal interactions among participants, and

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increase the motivation of participants. Additionally, board games have been found to support learning by improving participant motivation and interpersonal interactions (Noda et al., 2019).

A variety of board games are used to educate people concerning of their health. Amaro et al. (2006) introduce of educational board games of Kalèdo to increase children's awareness of nutrition and encourage a healthy lifestyle. Zeedyk et al. (2001) assessed the efficacy of a board game in enhancing children's understanding of road safety and hazard and discovered that the activities were significantly effective in improving children's knowledge (Zeedyk et al., 2001). Besides, boardgames have been used in therapeutic settings. Research done by Lin et al. (2015) found that playing the board game Go, significantly reduce the symptoms of depression, anxiety, and Alzheimer's disease in Alzheimer's patients. Board games may also encourage positive habits and behaviour changes (Lin et al., 2015). Khazaal et al. (2013), used board games as a therapy for smokers. Study revealed that persons in the experimental group returned to addiction less often than those in the control group. In terms of education, board games may assist youngsters in learning how to follow rules and spend time still for a certain amount of time (Khazaal et al., 2013). They may also help focus more. Boardgames can help students and trainees learn more about health by getting them interested and motivated (Riggs & Young, 2016). Learning should not be tedious, and it should not only be rote memory exercises where students memorize information or study for tests.

Hence, we believed that designing a board game is essential in assisting students in learning health topics. It also helps strengthening health literacy, which is defined as the ability of people to access, process, and comprehend fundamental health information and services required to make good health judgments.

3. The Idea and Plan

The development of the board game will adapt ADDIE model that was designed for teaching. This model is usually used as a guidance when developing new manual. ADDIE is an acronym for analysis, design, development, and evaluation (All, Castellar, & van Looy, 2016). Each phase involves several interrelated activities, beginning with pre-production, production and post-production of the board game. These is to ensure high-quality and user-friendly board game.

3.1. Questions development

The knowledge in the science and health textbooks currently used in primary and secondary schools will serve as the foundation for the majority of the health-related questions that will be generated. In addition, information from a health portal and a health education module owned by the Ministry of Health Malaysia will be also included. A group of experts in microbiology and public health will create the questions. The two public health experts will draft questions related to non-communicable diseases, basic anatomy, basic physiology and healthy lifestyle. Whereas the microbiologist will prepare questions related to microorganisms, basic immunology and infectious diseases. After that, in a series of meetings and discussions, all of the team members will review and approve the questions. There will be three sets of questions, one for each level: beginner, intermediate, and advanced. All levels can benefit from an additional set of questions about leading a healthy lifestyle. Three types of questions will be utilized namely yes/no for the beginner

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level and healthy lifestyle questions, one best answer for the intermediate level and short answer for the advanced level

3.2. Questions evaluation

Six reviewers with diverse backgrounds will next receive the finalised questions: primary and secondary school science teachers, health subject teachers, a family medicine professor, and a health education specialist. A form will be provided to the reviewers so they may make comments and provide input on each question. According to the reviewers' remarks, the researchers will amend and revise the questions.

3.3. Game Design

The game's design and layout will be almost identical to those of the well-known board game Monopoly. A board, two dice, pawns, four question card boxes with 25 cards each, tokens (represent vitamins), and a handbook are among the components. The centre of the square-shaped board will be made to resemble the stethoscope's structure. The board will have 8 slots available at each site, for a total of 32 slots in the outer layer. At the centre of the board will be another 30 slots. There will be five slots set aside for "Emergency Situations," in which the player must halt and provide aid. Five more slots will be designated for "Bonus," where players will receive vitamins, and five more slots for "Compound," where players must pay the compound by losing their next turn.

3.4. Usability Test

Pre and post survey will be done among 32 students from primary, secondary schools. At the beginning, the students will answer a set of questionnaires that comprises of 32 questions related to the content in the board game. Then, a group of 4 students will be given a set of GKG board game and they will have to play the game without any interference from the researchers. After that, the students will be asked to answer the same the same questionnaire. They will also have to write their view on the clarity of the instructions, the quality of the questions and general comment on the game. The data will be collected and analysed using SPSS.

4. Conclusions

Health instruction in schools should be entertaining and fun. Our next health-related boardgame may draw kids interested in learning about health-related topics. It will consequently lead to a greater understanding of health and disease prevention, which could result in a healthier way of life and a healthier country.

Acknowledgement

We would like to thank the Health Education Unit, Ministry of Health, Malaysia for their continuous support.

Funding

This study received no funding.

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Conflict of Interests

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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