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Development of Edu Game Smart Move Media as a Means of Healthy Lifestyle Education for Children with Obesity

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ABSTRACT

Background: Childhood obesity is one of the growing health problems, both globally and nationally. Unhealthy lifestyles such as fast food consumption, low physical activity, and unattractive educational methods are the main factors that affect the incidence of obesity in children. So that educational media innovation is needed that is interactive, interesting, and in accordance with the characteristics of children, one of which is through the development of game-based media. **Research Objectives:** This research aims to develop Edu Game Smart Move media as a means of healthy lifestyle education for children with obesity. **Research Method:** This study uses the Research and Development (R&D) method. The research procedure applies the ADDIE model, which includes five stages, namely the analysis, design, development, implementation, and evaluation stages. The implementation was carried out on 30 children at SDN 4 Sentul, Blitar City, in April 2026, with the inclusion criteria being school children who are obese and non-obese. Product validation was carried out by media experts from the Operational Service Administrator of the Malang Ministry of Health Polytechnic Study Program, Blitar Nursing D3 Study Program, and nutritionists from the Sananwetan Health Center. **Research Results:** The results of the assessment from the media expert validator showed a feasibility level of 88%, and from the material ahi validator showed a feasibility score of 98%. The results of the assessment of the Edu Game Smart Move product have met the criteria very well, with some suggestions and inputs. **Conclusion:** Edu Game educational media can increase children's understanding and encourage the formation of healthy living behaviors in daily life gradually.

Keywords: Obesity, Lifestyle, Edu Game, Educational Media

Background

Childhood obesity is a health problem that continues to increase every year, both in developed and developing countries (1). The World Health Organization (WHO) reports that in 2022, there will be 35 million children under the age of 5 who are overweight or obese. In Indonesia, based on the 2023 Indonesian Health Survey (SKI), the prevalence of obesity and obesity reached 19.7% in children aged 5-12 years and 16% in children aged 13-15 years. The high incidence rate shows that obesity in children is still a health problem that requires attention because it can have an impact on the health of children to adults.

Obesity results from an imbalance between the energy entering the body and the energy expended, leading to excessive accumulation of body fat (2). An unhealthy lifestyle is one of the main causative factors related to the increasing incidence of obesity in children (3). The causes of obesity in children vary widely, including genetic and behavioral factors, unhealthy diets, lack of physical activity, and stress (4). School children are a group that is prone to obesity because at that age, there are lifestyle changes characterized by increased consumption of fast food and decreased physical activity.

Children who are obese have a higher risk of developing various health problems, such as hypertension, diabetes mellitus, cardiovascular disorders, gallstones, and respiratory disorders (5). The impact of obesity not only affects physical health but can also lead to psychological disorders (6). This

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condition can cause a variety of mental health problems, ranging from low self-esteem and impaired body image to the appearance of depression and anxiety (6). Therefore, the application and habituation of a healthy lifestyle needs to be done from an early age (7).

A healthy lifestyle can be implemented through the consumption of a balanced nutritious diet, increased physical activity, maintaining adequate sleep and rest patterns, and reducing stress (8). One of the efforts that can be made is to conduct health education which is an important aspect in increasing awareness about the importance of a healthy lifestyle (9). Various efforts have been made to prevent and control obesity in children, one of which is through counseling and health education about a healthy lifestyle in schools (10). However, the delivery of monotonous and uninteresting material often makes children less enthusiastic and difficult to understand the material presented (11), so educational media that is interactive, interesting and in accordance with the characteristics of children is needed.

The development of digital technology provides an opportunity to develop game-based educational media that is able to increase children's motivation, engagement, and understanding through fun learning experiences. However, the development of website-based educational media in the form of games is still limited. Based on these conditions, the researcher developed the Edu Game Smart Move media, which is a website-based educational media that contains material on balanced nutrition, healthy and unhealthy food, calculation of body mass index (BMI), physical activity, and simple quizzes packaged in the form of games. This media is designed to increase children's understanding and encourage healthy lifestyle changes in children through an interactive and fun approach.

Research Objectives

This research aims to develop and assess the feasibility of Edu Game Smart Move as a website-based educational media in increasing understanding of healthy lifestyles in school-age children as an effort to prevent and control obesity.

Methods

This research uses a design Research and Development (R&D) with the ADDIE development model consisting of five stages, namely analysis (analysis), design (Design), development (development), implementation (implementation), and evaluation (evaluation). This research is limited to the implementation stage. The products developed are in the form of the Edu Game Smart Move website-based as a medium for educating a healthy lifestyle.

This research will be carried out in April 2026 at SDN 4 Sentul, Blitar City. The study population is elementary school-age children (6-12 years old) at SDN 4 Sentul, Blitar City. The sampling technique used was purposive sampling with 30 respondents, consisting of obese and non-obese children. Based on the results of the study of 30 children, there were 18 children with obesity, 3 children with over-nutrition, 7 children with normal nutritional status, and 2 children with under-nutrition. In addition, this study involved one material expert, namely a nutritionist from the Sananwetan Health Center, Blitar City, and one media expert, namely the Administrator of the operational services of the Ministry of Health Polytechnic of the Ministry of Health, Malang, D3 Nursing Study Program, Blitar

The research variables are the development and feasibility of Edu Game Smart Move as a medium of healthy lifestyle education for school-age children. The analysis stage is carried out through interviews with teachers, media experts, and material experts to identify the needs of educational media. The design stage is carried out by designing the appearance and media materials of Edu Game Smart Move. The development stage includes media creation, validation of material experts and media experts, and product improvements. The implementation stage was carried out through a small group trial of 5 respondents and a large group trial of 30 respondents to assess the feasibility of media. The assessment instruments used include interview sheets, validation sheets of media experts and material experts, feasibility assessment sheets by respondents, and checklist sheets for the application of media in daily life. The research instruments used in this study were validated through an expert feasibility assessment process. The media feasibility assessment was carried out by one material expert and one media expert using a validation sheet. The validity of the instrument is calculated using the percentage formula from Arikunto (12) to determine the level of media eligibility.

Table 1 Eligibility Criteria

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Average score	Klasifikasi
81% - 100%	Highly Worth It
61% - 80%	Worthy
41% - 60%	Quite Decent
21% - 40%	Less Worthy
<20%	Not Eligible

Furthermore, the results of the feasibility assessment obtained were analyzed based on certain criteria using the formula adopted from Arikunto (12), which is as follows.

$$P=\frac{\sum R}{N} \times 100\%$$

Description :
P = Percentage Eligibility
(∑) = Total score obtained
(∑i) = Ideal score number

The data was analyzed descriptively using percentages to determine the level of media feasibility based on the results of expert validation and respondent trials. The confidentiality of respondents' identities and data is maintained by not including names in the research results and is only used for research purposes.

Results

The characteristics of the respondents in this study consisted of 30 school-age children (6-12 years old) who were at SDN 4 Sentul, Blitar City with different nutritional status categories.

Table 1 Characteristics of Nutritional Status of Respondents

Nutritional Status	Quantity
Obesity	18
More Nutrition	3
Normal/Good Nutrition	7
Malnutrition	2
Total	**30**

Based on the table above, the nutritional status of obesity is the category that is most commonly found in respondents compared to other categories of nutritional status. This condition shows that obesity is still one of the health problems in school-age children that requires prevention and control efforts.

The needs analysis was carried out through interviews with teachers and observations of students at SDN 4 Sentul, Blitar City. The results of the analysis show that healthy lifestyle education has been provided through the lecture method with leaflets and posters. However, the media is considered less attractive to children. In addition, there are still children with obesity and overnutrition status, so educational media that is interactive, interesting, and in accordance with the characteristics of children is needed.

The design stage produces a website-based Edu Game Smart Move educational media that contains healthy lifestyle materials. The media developed consists of various educational features, including balanced nutrition materials, calculation of body mass index (BMI), healthy foods and their benefits, unhealthy foods and their impacts, physical activity, and simple quizzes. The media that has been developed is then validated by media experts and material experts, and improvements are made in accordance with the input that has been given. The validation results show that Edu Game Smart Move

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media has a very feasible category based on the assessment of media experts and material experts.

Table 2 Expert Validation Results

No.	Validation	Score	Standard Criteria	Remarks
1.	Mr. S	88	$P = \frac{110}{125}\ x\ 100\% = 88\%$	Highly Worth It
2.	Mrs. S	98	$P = \frac{49}{50}\ x\ 100\% = 98\%$	Highly Worth It

Based on the table above, it can be seen that the validation results show that Edu Game Smart Move received a very decent assessment category from media experts and material experts. The assessment shows that the media developed has met the feasibility aspects of content, appearance, language, ease of use, and suitability of the material with the aim of educating a healthy lifestyle in children. Some of the feedback from validators is used as the basis for media improvement and refinement.

After going through a validation process by material experts and media experts, the media was then tested. The implementation of this stage was carried out through a small group trial of 5 respondents and a large group trial of 30 child respondents with obesity or non-use to obtain a feasibility assessment. The following are the results of the recapitulation of the product feasibility test assessment sheet by the participants:

Table 3 Results of the Feasibility Respondent Trial

No.	Validation	Score	Standard Criteria	Remarks
1.	Small group trial (5 respondents)	217	$p\ = \frac{217}{250} x\ 100\% = 86{,}8\ \%$	Highly Worth It
2.	Large group trial (30 respondents)	1258	$P = \frac{1258}{1500}$ x $100\% = 83{,}8\%$	Highly Worth It

Based on the table above, the results of the small group (5 respondents) and large group (30 respondents) trials show that the Edu Game Smart Move media obtained a very feasible category. This is shown by the percentage of eligibility in the small group trial of 86.8% and the large group trial of 83.8%, both of which are in the range of the very feasible category. These results show that the developed media has met the feasibility aspects in terms of convenience, practicality, and convenience.

Discussion

The results of the study show that obesity is still a health problem found in school-age children, so prevention and control efforts are needed from an early age through the implementation of a healthy lifestyle. The needs analysis shows that the health education that has been provided in schools is still dominated by conventional methods with the use of printed media such as posters and leaflets. These methods are considered less effective because children tend to get bored easily if they are only done by lectures without interesting supporting media. This is in line with the concept of *learning by* playing which can be applied through the use of interesting educational tools to help children develop their potential and skills while making the learning process active and enjoyable (13). This condition shows that interactive, interesting media, in accordance with children's characteristics, are needed to increase understanding of a healthy lifestyle.

Edu Game Development *Smart Move* Website-based provides an alternative educational media that is more interesting and easily accessible to children. The Edu Game Smart Move media is designed visually and audio visually with an attractive appearance in the form of a website that contains various educational features such as an introduction to balanced nutrition, calculation of body mass index (BMI),

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healthy food materials and their benefits, unhealthy food and its impacts, physical activity, and simple quizzes. This media is designed in an interactive manner that aims to increase children's interest in learning and help children understand the relationship between daily habits and body health conditions. This is supported by previous research that states that interactive media helps children in improving understanding, increasing interest in learning, and making learning more interesting (14).

Edu Game eligibility assessment *Smart Move* Based on the assessment of material experts and media experts, it is shown that the media developed is included in the category of very feasible as a healthy lifestyle educational media based on Arikunto's eligibility criteria (12). The assessment from the material expert shows that the material presented is in accordance with the learning objectives, easy to understand, and uses language that is in accordance with the level of development of school-age children. In addition, media experts' assessments show that the appearance, layout, and ease of use of media have supported the learning process. This shows that the quality of content and media design has an important role in increasing the effectiveness of educational media. Based on the results of the trial with small groups and large groups, it was shown that the Edu Game Smart Move media received a positive response and received a very feasible category from the assessment of the eligibility of the respondent based on Arikunto's eligibility criteria (12). The ease of use and attractive appearance of Edu Game Smart Move allow children to be more active so that it can support the creation of a fun learning atmosphere and increase learning motivation. This is in line with research that states that digital-based educational media has proven to be effective in increasing understanding of health information while forming a positive attitude (15).

This research develops a website-based Edu Game Smart Move educational media that integrates the concept of *educational games* with healthy lifestyle and obesity prevention materials in school-age children. The media not only serves as a means of delivering information, but also provides an interactive learning experience through quizzes and educational games. Thus, Edu Game *Smart Move* is an alternative educational media that can be used by health workers, teachers, and parents in supporting efforts to prevent and control obesity in children.

Conclusions and Recommendations

Based on research on the development of Edu Game Smart Move media as a means of healthy lifestyle education for children with obesity, it shows that the importance of health education media that is attractive, easily accessible, easy to understand, and in accordance with the characteristics of children so that there is a need for development stages such as the analysis stage, the *design* stage, and the development stage), as well as the level of product feasibility. The results of the Edu Game Smart Move media assessment were very decent plus some input from expert validators. This shows that the media is able to be developed properly and is suitable for use as a means of education. This Edu Game educational media can increase understanding and encourage the application of healthy living habits in daily life gradually.

The next research is suggested to continue the development stage of Edu Game Smart Move to the evaluation stage and implement it on a wider range of targets. Media development can also be done by adding more interactive features and improving the appearance and content of the material so that media can be used more easily and optimally as a means of educating children about a healthy lifestyle in children. In addition, the Edu Game Smart Move media is expected to be used by teachers, parents, and health workers as a supporting educational media in efforts to prevent and control obesity in children.

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