

The Effectiveness of Smart Box Media on The Knowledge and Attitude of MI Hidayatus Syam Students on PHBS at School Healthy Snack Indicators

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Abstract

Introduction: Health is an important problem in Indonesia, especially the health problem of school-aged children. Based on 2023 Jambi Health Service data, West Tanjung Jabung Regency implemented the lowest level of health promotion in schools. Students' lack of knowledge in PHBS indicators of healthy snacks can cause various health problems. For this reason, interesting media innovations such as Smart Box are needed as a health promotion tool for school-aged children. **Objective:** This research aims to determine the influence of Smart Box Media on students' knowledge and attitudes regarding PHBS indicators of healthy snacks. **Method:** The design of this research is a quasi-experiment with a one group pretest and posttest research design. This research was conducted in December 2024. **Result and Discussion:** The results show that the average student knowledge score increased from the pretest 54.00 to 73.00. The attitude score increased from 58.50 to 75.08 on the posttest. **Conclusions:** There is an influence of Smart Box PHBS healthy snacks on increasing the knowledge and attitudes of MI Hidayatus Syam students with a p-value of 0.001

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Introduction

Health is an important problem in Indonesia in particular health problems of school-aged children (Gustina et al., 2019). To achieve degrees high health needs to be cultivated in behavior that shows concern for health. Clean and Healthy Living Behavior (PHBS) includes a series of actions which is based on knowledge and learning goals, which is empowering individual, family, group, or community to take responsibility for their own health and contribute to public health. Education PHBS health is the core of the teaching and learning process so that students can independently manage basic health conditions through appropriate activities within and across outside school (Ari Angga Rianto, 2023).

Lack of concentration on students' learning due to a dirty classroom environment disturbing comfort as a result, students' enthusiasm for learning decreases and the effect on the school's image is reduced. Creating a school environment A healthy lifestyle will help students maintain optimal health and improve their health academic achievement (Azhary et al., 2024). Thus, it is important to implement PHBS effectively in the school setting to improve the health and achievement of students and create a conducive environment (Pratiwi Dian, 2024).

According to WHO (2017), the impact of not implementing PHBS can reach 100,000 Indonesian children who die every year (Puteri & Yuristin, 2021). The large population of this age group of school-aged children certainly poses a risk of contributing to public health problems (Herwansyah et al., 2018). As many as 40-60% of children are affected by worms, 23.2% suffer from anemia, 74.4% experience tooth decay and 3% of them have smoked under the age of 10 years (Fitria Eka Putri et al., 2023).

Based on BPOM (2020), 46.80% of all food poisoning cases were caused by snacks/fast food, 15.9% of which occurred frequently in SD/MI (RI, 2020). Based on data from the Jambi Province Health Office in 2023, West Tanjung Jabung Regency has the lowest percentage of schools that promote health, namely only around 50.3% of the 100% achievement target compared to other districts such as Jambi City reaching 92.1%, Sarolangun reaching 100% and Tebo reaching 100%. For this reason, it is necessary to increase interactive health promotion related to PHBS and safe food for school-aged children.

Until now, the world of health still uses minimal media as a game health promotion facilities (Aini Zahra et al., 2023). One of the health education media that can be used for school-age children is using smart box educational game tools. Smart box media is a game specifically designed to support children's learning effectively and fun, while stimulating their learning spirit. Thus, children can learn in a more interesting and interactive way. Health promotion through smart box media has many benefits. Smart boxes have various advantages, including presenting a variety of activities combined with games on each page. The use of bright colors in the design also serves to spur students' enthusiasm during the learning process. In addition, smart boxes can be made from recycled materials, making them an environmentally friendly option. (Oktavia et al., 2024).

MI Hidayatus Syam is one of the Diniyah Takmiliyah Madrasah level education located in Tanjung Jabung Barat Regency, Jambi Province with a total of 389 students. Based on the initial observation, the knowledge of MI Hidayatus Syam students regarding healthy snacks is only 40%. In addition, the habit of snacking among children is increasing along with the number of traders who sell various types of snacks such as ciki, candy, ice, and other snacks in the neighborhood around the school. This phenomenon is

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a concern because most of the snacks sold do not meet health standards, contain artificial colors and sweeteners, and have high levels of sugar and MSG. As a result, many children are accustomed to buying these snacks without considering their health impact, which risks causing various health problems such as obesity, digestive disorders, and decreased immunity.

As a health worker, this is a serious problem that needs to be addressed. The approach used to change habits is certainly by adjusting the characteristics of school-age children, who consider play an activity that is carried out throughout the day. Therefore, learning activities and health promotion should be designed as games for children, but still contain health values. Health Promotion on PHBS indicators of healthy snacks through the media of educational game tools such as smart boxes is a solution that can be applied. The selection of this topic is considered appropriate because it is relevant to the characteristics of elementary school children who are at the cognitive development level. The use of this concept by means of games is almost the same as the concept of children's learning, namely learning through play. (Siti Nur Hayati & Putro, 2021).

Method

This research is a type of quasi-experimental research using a design *One Group Pretest-Posttest design*. According to Sugiyono (2021), design *As if experimental* has a control group, but is not fully able to control external variables that can influence the course of the experiment (Sugiyono, 2021). Smart Box media is used as an intervention tool in health promotion regarding healthy snacks. This type of research aims to compare the results of students' knowledge and attitudes before and after the intervention. The population in this research is there were 62 MI Hidayatus Syam class V students. The sampling technique used in this research is purposive sampling. The case sample in this research was 30 class V MI Hidayatus Syam students. According to Roscoe (1975) in Sugiyono (2017: 131), in each study, the appropriate sample size ranges from 30 to 500. Analysis uses a paired t-test.

Before starting intervention in class, introductions and approaches are made to students. After that, research subjects were provided with research equipment consisting of smart box media and research questionnaires. Then ask for student approval to fill out informed consent to become research subjects. The pre-test contains questions about PHBS knowledge on healthy snacks indicators in the form of a Guttman scale and student attitude statements about PHBS on healthy snacks indicators in the form of a Likert scale. In implementing the snakes and ladders game, the researcher was assisted by 2 game assistants considering the limitations of time and energy. Each group consists of 5-6 people, and then each person plays according to the order of the rooms in the smart box. The first room is about matching the nutritional content of healthy snacks. The second room, recognize how to choose healthy snacks. The third cubicle contains material on the dangers of careless snacks and the fourth cubicle contains quiz questions regarding healthy snacks. After playing the smart box, a post-test was carried out.

Data was collected using a validated questionnaire. The results of the validity test of the knowledge and attitude questionnaire with 10 question items each are valid. The reliability test with Cronbach's Alpha was 0.760 for the knowledge questionnaire and 0.782 for the attitude questionnaire. It can be concluded that all items from each questionnaire for each variable are reliable. This can be seen from the calculated r value being greater than table r (0.6 = reliable). The attitude and knowledge questionnaire were

reliable for use in this research.

Research and Discussions

1. Result

Respondent Characteristics

The following is a description of the characteristics of the 30 respondents, including age and gender, which can be seen in the following table.

Tabel 1		
Distribution of Respondent Characteristic		
Respondent Characteristic	Total (n)	%
Age		
9 years	6	20
10 years	14	46.7
11 years	9	30
12 years	1	3.3
Gender		
Male	10	33.3
Female	20	66.7
Total	30	100

Source: Primary Data 2024

Based on table 1, most of the respondents were 10 years old, 14 respondents (46.7%) and only 1 respondent was 12 years old (3.3%). Meanwhile, the distribution of respondents based on gender was mostly female, namely 20 respondents (66.7%) and 10 male respondents (33.3%).

Data Normality Test

The data in this study is normally distributed, the paired sample t test is used in the analysis of this study. The following are the results of the Shapiro Wilk normality test.

Table 2		
Knowledge and Attitude Data Normality Test		
Variable	Significance	Description
Knowledge		
Before	0,178	Normal
After	0,150	Normal
Attitude		
Before	0,107	Normal
After	0,577	Normal

Source: Primary Data 2024

The results of the normality test show that all significance values are > 0.05 , this shows that the data is all normally distributed. The following are the results of the paired t test on student knowledge and attitude variables before and after the intervention.

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Description of respondents' knowledge and attitudes

Table 3

The influence of Smart Box media on knowledge and attitudes

Variable		n	Mean	SD	Min	Max	p-value
Knowledge	Before	30	54,00	21,90	0	100	0,001
	After	30	73,00	18,41	50	100	0,001
Attitude	Before	30	58,50	12,87	30	83	0,001
	After	30	75,08	12,48	48	95	0,001

Source: Primary Data 2024

Based on the table above, the average value of the students' knowledge intervention results before the intervention using smart box media was 54.00 with standard deviation 21.90. In the measurements after the intervention, the average value was 73.00 with a standard deviation of 18.41. The statistical test results obtained $p = 0.001 < 0.05$, so the null hypothesis was rejected, which means there was a significant difference in influence between students' knowledge before the intervention and after the intervention using smart box media. Based on the output above, the average value of the student attitude intervention results before the intervention using smart box media was 58.50 with a standard deviation of 12.87. In the measurements after intervention, the average value was 75.08 with a standard deviation of 12.48. The results of statistical tests obtained a value of $p = 0.001 < 0.05$, so the null hypothesis was rejected, which means that there was a significant difference in the influence between students' attitudes before the intervention and after the intervention using smart box media.

2. Discussion

The effect of smart box media on increasing PHBS knowledge of healthy snack indicators

Knowledge is the result of human sensing, or the result of a person's knowledge of objects through the senses they have (eyes, nose, ears, and so on). Most of a person's knowledge is obtained through the sense of hearing (ears) and the sense of sight (eyes). A person's knowledge of objects has different intensities or levels. Sensing occurs through the human senses, namely the senses of sight, hearing, smell, taste, and touch (Notoatmodjo, 2021)

Judging from the results of the research that has been carried out, a p-value of 0.001 is obtained, where the p-value is <0.05 . So, it can be stated that there is an influence between smart box media on students' knowledge regarding PHBS indicators of healthy snacks at MI Hidayatus Syam. This is because the smart box has a variety of toys. Boxed media contains words and images to provide educational resources and stimulate students' curiosity about the topics discussed. This media includes educational and visual components. By increasing concentration and promoting a positive learning atmosphere, student learning outcomes can be improved by using the Smart Box (Maulidina & Faulia, 2025). In line with research by (Cahyaningtyas et al., 2024) that media *smart box* said to be feasible, interesting and effective for use by students. The validity results of media experts obtained a percentage of 83% (very feasible) and total number of scores from validators material, namely 79% (feasible). The attractiveness of the media was obtained from a trial questionnaire which was answered by respondents with a score of 88% (very

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decent).

Based on the results of research that has been carried out and supported by theory and previous research, smart box media has an influence on MI Hidayatus Syam students regarding PHBS indicators of healthy snacks. This is because information and messages are easily conveyed because children learn while playing. The average knowledge score shows an increase from 54.00 to 73.00 after being given the intervention, namely the PHBS smart box media, an indicator of healthy snacks. There is an influence of the PHBS smart box media indicator for healthy snacks on increasing knowledge of healthy snacks.

The influence of smart box media on increasing PHBS attitudes towards healthy snacks

Attitude is a reaction or response that is still closed from a person to a stimulus or object. Attitude is one of the factors that can influence the goal of achieving learning achievement. Attitude is a thought pattern that each person has, such as feelings or responses to other people, objects or problems (Maulidiana et al., 2024). School children's choice of snacks is influenced by various factors, including knowledge, attitudes, and the environment. A study in the Public Health Journal (2020) found that around 60-70% of elementary school students still choose snacks based on taste and price, not health factors. Research by the Indonesian Ministry of Health (2018) shows that only around 40% of school children have high awareness of choosing healthy snacks, while the rest often consume unhygienic and less nutritious food. Based on the research results, the average increase in attitude before and after the health promotion intervention using PHBS smart box media, the indicator for healthy snacks, was 16.58, meaning there was an increase in attitude of 33%. The statistical test results show a p-value of $0.001 < 0.05$, so it can be concluded that the intervention using PHBS smart box media as an indicator of healthy snacks has an influence on improving students' attitudes regarding choosing healthy snacks.

The results of this research are supported by Nugraha B's research which states that the use of smart box learning media has a positive effect, as evidenced by the increase in the average score from 65 to 82 in class A (which uses Smart Box), while class B (which uses conventional methods) only increases from 64 to 70, thus showing that Smart Box is more effective in stimulating student creativity through more active interaction, an interesting learning environment, and an approach that encourages students to think critically and find solutions in the context of the material being studied (Nugraha et al., 2024).

Conclusion

The average initial knowledge score of respondents was 54.00 and then increased to 73.00 or an increase of 19.00% with a p-value of 0.001 ($p < 0.05$) so that there was an influence between the PHBS smart box media as an indicator of healthy snacks on knowledge about healthy snacks among MI Hidayatus Syam students. Meanwhile, the average initial attitude score for students was 58.50, which then increased by 75.08 or experienced an increase in score of 16.58% with a p-value of 0.001 ($p < 0.05$), so there was an influence between the PHBS smart box media as an indicator of healthy snacks on attitudes about healthy snacks among MI Hidayatus Syam students. There is an increase in the knowledge and attitudes of MI Hidayatus Syam students and there is also an influence.

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