

The Effect of Providing *Smart Box* Education Si Woody (*Simple Wounds Handling*) on The Knowledge of School-Age Children

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ABSTRACT

Children aged 6–12 years are particularly prone to minor wounds, which are superficial skin injuries limited to the subcutaneous tissue. If not properly treated, such wounds may lead to complications, making proper wound care knowledge essential. Equipping children with the ability to handle minor injuries is important, and educational strategies such as lectures and multimedia tools can effectively enhance their understanding. This study examined the impact of the *Smart Box Si Woody*—an educational media tool designed to teach proper wound care—on school-aged children's knowledge. The *Smart Box*, with its attractive shape, colors, and concept, aims to increase children's engagement and interest in learning. A quasi-experimental design was used, specifically a one-group pretest-posttest model without a control group. A total of 54 participants were selected through purposive sampling. Knowledge was measured using a questionnaire on basic wound care. The results showed that most participants were ten years old (83.3%), with females being the majority (57.4%). The Wilcoxon signed-rank test yielded a p -value of 0.000 ($p < 0.05$), indicating a significant improvement in knowledge after the intervention. These findings suggest that the *Smart Box Si Woody* is an effective educational tool for teaching proper wound care to children.

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1. INTRODUCTION

Children aged 6-12 years are included in the category of school-age children where at this time children have entered the elementary school level and this phase is often referred to as the intellectual phase (Sabani, 2019). The rules for the age of children entering elementary school (SD) are regulated in the Regulation of the Minister of Education and Culture (kemendikbud) Number 1 of 2021. The regulation states that prospective new grade 1 elementary school students must meet the requirements, a minimum age of 7 years, and a minimum age of 6 years on July 1 of the current year (kemendikbud, 2021). *World Health Organization* (WHO) school children are the age group between 7-12 years (WHO, 2014). Several health issues that often occur in school-age children and are a priority in overcoming them are nutrition, non-communicable diseases, reproductive health, HIV, drugs, mental health, sanitation, violence and injury (kemenkes, 2018). School-age children from the age range of 5-14 years have a high risk of injury because they have a high sense of curiosity and are in the gross motor development stage (Winingsih *et al.*, 2019).

Injury is a global problem that often occurs in school-age children, children spend more time at school doing activities that can cause children to fall and experience injuries or injuries both mild and severe. Children sometimes in carrying out activities at school do not escape accidents that cause injuries or injuries (Ministry of Health of the Republic of Indonesia, 2018). Childhood injury is a global health problem that contributes to mortality. Meanwhile, one of the places where injuries occur in children is at school and its environment, both in the classroom and on the school grounds (Ministry of Health, 2018). Accidents that often occur in children are falls, if caregivers, parents, teachers, or people around them do not know how to provide first aid, it will only cause panic. Falling in children can also cause emergency conditions this can be influenced by various factors both from height, environmental conditions, fall position and improper fall management. As a result of falling, many children eventually experience dislocations, fractures and even death if exposed to vital parts or organs such as hitting the head (Anam *et al.*, 2021).

According to the *World Health Organization* (WHO, 2021), the mortality rate due to fall injuries is in second place. In Indonesia, the incidence of injury is 11.9%. The incidence of injury in Central Java was 9.7%. The types of injuries experienced were bruises 74.6%, abrasions 22.2%, sprains 25.8% (Riskasdas, 2018). The prevalence of children who experience injuries in Indonesia is most prevalent at the age of 5-14 years with a percentage of 12.1%, based on gender the highest rate is male with a percentage of 11%, and the limbs that often occur when injured are the lower limbs 75.5% (Kemenkes RI, 2018). The most common types of wounds in Indonesia are abrasions (70.9%) and lacerations (23.2%) (Mustamu *et al.*, 2019). Skin abrasions are caused by friction or scratching. Usually, the outer layer of the skin is lost, and the wound area secretes a cloudy liquid or blood. Usually, after being injured, children still continue to play and pay attention to hygiene so that soil, sand and other dirty materials often stick to the wound area. If the wound is covered with dirt, clean it immediately and perform simple wound care (Ministry of Health of the Republic of Indonesia, 2022).

Abrasions due to falls, wounds from sharp objects such as knives, nails and so on are considered simple wounds (Susanti *et al.*, 2021). A simple wound is a break in skin continuity whose depth is limited to subcutaneous fatty tissue, does not affect underlying structures (muscle, bone, joints, major arteries, nerves, tendons) and without significant tissue loss (Cahyono *et al.*, 2021). Simple wound care refers to a series of measures to prevent trauma to the skin and mucous membranes of other tissues due to trauma, fractures, and surgical wounds that can damage the skin surface (Harun *et al.*, 2024). simple wound care also aims to shorten healing time and prevent infection due to the entry of pathogenic microorganisms. Good and correct wound care is needed so that the wound healing process can be optimized (Wintako *et al.*, 2020).

Providing appropriate and prompt assistance can reduce the impact or risk of adverse effects on the wound. Good knowledge of wound care is necessary to be able to provide quick and appropriate first aid without having to wait for direction if you are at the scene. The existence of inaccurate information or action techniques can lead to errors, especially in understanding good and correct wound care. So the importance of knowledge for students related to first aid is very necessary. Handling open wounds or dirty wounds if not done with the correct principles can result in infection of the wound (Sari *et al.*, 2024). With a high number of injuries, children must be able to independently perform simple wound management to prevent severity if not treated quickly and inappropriately (Geha Raj., 2022). One way for children to be able to perform first treatment.

Health education can be carried out using media to attract children's attention and make children better understand what is being conveyed because elementary school children have very good absorption (Oura *et al.*, 2024). Health education can be delivered by telling stories using media in the form of electronic media (television, radio, *cellphones*, and *slides*), print media (*booklets*, *leaflets*, *pop ups*, *smart boxes*, etc.) and media boards / *bill boards* or without media with the lecture method. Using media in delivering health materials, materials or messages can facilitate officers when conducting health education. Media that are often used are print media including *booklets*, *leaflets*, and *pop up books* (Kusuma *et al.*, 2021).

The media used in this study is *smart box* media. Smart box media can also be called a smart box because the shape of the media is in the form of a box containing materials related to simple wound handling. *Smart box* is a learning media that contains material that is packaged attractively, the outer appearance is gift-shaped with attractive images (Cahyaningtyas *et al.*, 2024). *Smart boxes* can improve students' cognitive learning outcomes and improve student memory (Yuliasri *et al.*, 2021) This opinion is in line with the research of Sohiah *et al.*, (2023) that the use of *smart boxes* can improve children's learning outcomes. Based on the description of the problem, the researcher provides *smart box* learning media innovation. *Smart boxes* in their use have the benefit of improving student learning outcomes due to the creation of a pleasant learning atmosphere and increasing student learning concentration (Oktavia *et al.*, 2024). Research on the development of *smart box* learning media has been researched by a number of people. The results of research from Yuliasri (2021) show that there are differences in the value of the media before and after providing material with the use of *smart box* media, the results are 41% began to develop before using *smart box* media and after using the results obtained 80.4% developed very well (Yuliasri *et al.*, 2021).

This study aims to determine the effect of providing smart box education si woody (*simple wounds handling*) on knowledge of simple wound handling in school-age children. And to increase children's knowledge related to simple wound handling so that children can independently perform the first treatment when injured quickly and precisely.

2. RESEARCH METHOD

This research is quantitative research with the approach used, namely *quasi experimental design* with experimental research methods whose control groups do not function fully to control external variables that will affect the experiment (Sugiono, 2019). The design in this study used the *One Group Pretest-Posttest Design without control* model. This design model has a pretest before treatment and a posttest after treatment (Oktania & Djami, 2022). The population in this study was 118 students from class IV SD Negeri Mojosongo V Surakarta using the 10% slovin formula to determine the number of samples to be taken.

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{118}{1 + 118(0,1)^2}$$

$$n = \frac{118}{1 + 118(0,01)}$$

$$n = \frac{118}{1 + 1.18}$$

$$n = \frac{118}{2,18}$$

$$n = 54.1 \text{ rounded up to } 54$$

Based on the results of the calculation, the number of samples taken was 54 students. The sample determination was selected by the respective homeroom teacher. This study used 2 research tools, namely a simple wound handling knowledge questionnaire with a *Closed ended multiple choice questionnaires* model consisting of 25 questions and has been tested for validity and reliability at SD Negeri Mojosongo III no. 235 Surakarta. This questionnaire is scored using a guttman scale, the score for the "correct" answer is 1 and the score for the "wrong" answer is 0. The second research tool is the woody *smart box* media. The following is a picture of the *Smart box Si Woody* media in this study.



Picture 1. Smart Box Educational Media

In this study, this study began by submitting a research permit to the principal of SD Negeri Mojosongo 5 Surakarta after getting a reply letter from the *Ethical Clearance* test, then meeting the homeroom teacher of each class, namely classes A, B, C, D to determine the sample, after that explaining the research process and inform consent to the mayor to then be given to parents or guardians of students. And finally conduct research at the specified time and then process the data that has been obtained.

3. RESULT AND DISCUSSION

Based on the results of the study, the following results were obtained:

1.1 Univariate Analysis

1.1.1 Characteristics of respondents

The characteristics of respondents in this study are age and gender, the following are the results of the research conducted:

Table 1. Characteristics of respondents based on age and gender

Age (Year)	Frequency (f)	percentage (%)
11 years old	6	11,1
10 Years	45	83,3
9 Years	3	5,6
Total	54	100,0
Gender	Frequency (f)	Percentage (%)
Male	23	42,6
Female	31	57,4
Total	54	100,0

Based on table 1. the distribution of respondents in this study found that the age of the most respondents was 10 years old as many as 45 children with a percentage of 83%, while the distribution of respondents based on gender in this study found that the most gender was female, namely 31 respondents with a percentage of 57.4%.

A. Age

In his age range, it is included in the category of school-age children, namely 6-12 years old whose activities are more at school and away from the reach of parents. At school children prefer to play without paying attention to the safety and health of themselves so that it is not uncommon for children to experience minor or severe injuries. The incidence of injuries in schools is very frequent and requires knowledge related to first aid so that it can help save injured victims as quickly as possible (Pansakun *et al.*, 2024).

In Ismayanti's research (2025) said that in this period children experience rapid development in various aspects, such as physical, cognitive, social, and emotional. Understanding the growth and development characteristics of children in this generation is very important to ensure optimal development. Children with an age range of 9-11 years have very good absorption (Oura *et al.*, 2024) During the elementary school stage, children are at a critical period where growth and development, as well as physical and mental conditions in children are very malleable (Can *et al.*, 2024). Children will more often get new experiences and new associations that may not be good for themselves. children at this age will do something that is often seen and heard from the surrounding environment so that it must be considered well what should be given, and modeled to children so that children can also do good and positive things.

According to researchers, school-age children are curious about many things that interest them, for this reason children must be prepared and given information related to simple wound management so that they are able to save themselves, reinforced by research from Dahal (2022) that children aged 7-14 years are able to perform basic life- saving skills. Children's knowledge and skills do seem adequate but they find the thought of algorithms difficult due to lack of information, therefore to increase the knowledge of the child himself is given education with unique media so that it attracts children's attention. Reinforced by research from (Ansari *et al.*, 2024).

Smart Box media is very suitable for use in providing information to school- age children, namely children with an age range of 6-12 years, reinforced by the research of Cahyaningtyas *et al* (2024) which states that the knowledge of school-age children increases with the results of 58% to 86% by providing education using smart box media. The use of smart box media in providing education can make the learning process more interesting for school-age children, due to its unique shape and the contents of the smart box which has 4 sides with different designs on each side, in line with research from Komalasari *et al.* (2024) which states that the validation test carried out obtained a score of 96% or very feasible by the validator and the validator gave very relevant responses related to the smart box for providing material to respondents.

B. Gender

Based on the research conducted, the results obtained were 23 male respondents (42.65%) and 31 female respondents (57.4%). In this study the majority of respondents were female with a difference of 14.8%. In some studies also show data that the majority of the gender of the respondents is female. In line with research conducted by Gusrianty (2021), it states that the characteristics of the most respondents are women with a total of 26 out of 30 respondents.

Researchers argue that gender characteristics in this study have no effect on the final results because based on the data obtained, the values of men and women both experienced an increase. Reinforced by research

conducted by Fitrihanur *et al* (2024), stating that the development of motor skills in men and women who are given the same encouragement, equipment and opportunities to practice for years at an early age is not found to be a meaningful gender difference, in line with research conducted by Willaim *et al.*, (2025). which states that the importance of integrating gender responsive education policies to improve literacy and reduce achievement gaps in children based on gender. In this study, the researcher argued that respondents with Female respondents are more active and responsive than male respondents, seen from their response during the process of delivering material using smart box media, respondents with female gender ask more questions and can be invited to hold discussions in line with research conducted by Apriani *et al.*, (2024) explained that respondents with female gender are more likely to be active than men because the sense of caring in women is greater than men so that respondents with female gender are more responsive in the process of delivering health education.

1.1.2 Children's Knowledge Level in Handling Simple Wounds Before Being Given Health Education Related to Handling Simple Wounds Using Smart Box Media

Table 2. Children's knowledge before intervention

Knowledge	Frequency (f)	Percentage(%)
Good	0	0
Fair	33	61,1
Less	21	38,9
Total	54	100,0

Based on table 2. It can be seen that in the intervention group before being given Health Education related to handling simple wounds with smart box media, the majority of respondents were in the moderate category, namely 33 respondents with a percentage of 61.1%, and respondents in the poor category were 21 respondents with a percentage of 38.9% while there were no respondents in the good category.

The results of the initial question and answer before being given simple wound handling education with smart box media were 9 out of 27 respondents in the first session had experienced blisters due to falling during sports activities on the school field, in the second session about 4 people had also experienced falling and resulting in children being injured, when asked about the handling done by children when injured it was still wrong and some respondents said they did not know at all about the correct handling of simple wounds. This is in line with research conducted by Mita *et al* (2025) on school- age children with pre-test results showing that the majority of students have limited knowledge, with most not knowing much about the basic steps of wound management.

Based on the above, the researcher argues that this occurs due to lack of exposure to health education related to simple wound management among school-age children, according to research from Roziqin *et al*, (2025) which states that there is a significant relationship between exposure to information and a person's knowledge.

With the existence of problems related to lack of knowledge due to exposure to information related to simple wound management, to respond to this, the knowledge of children needs to be improved in one way, namely providing Health Education related to wound management, in line with Prieto-González *et al.*, (2021) which explains that in formal education, education about first aid during an injury can be taught, especially for children so that they have knowledge about what to do when performing first aid in an emergency. Reinforced by research from Owoeye *et al.*, (2022) which states that providing health education regarding first aid for injuries is a strategic solution to increase the awareness and ability of students, teachers, and school officials to deal with injuries quickly and effectively.

Researchers argue that if health education is not given properly in an unattractive form, children will feel bored so that the information provided cannot be received properly.

This is in line with research conducted by Anisa & Mega (2020) which says that the more interesting the media used in providing information to children, the higher the enthusiasm of children to pay attention and absorb information well.

1.1.3 Children's knowledge level in handling simple wounds after being given health education related to handling simple wounds using Smart Box media.

Table 3. Children's knowledge after intervention

Knowledge level	Frequency (f)	Percentage (%)
Good	40	74,1
Fair	14	25,9
Less	0	0
Total	54	100,0

Based on table 3. It can be seen that in the intervention group after being given Health Education related to simple wound management with smart box media, the majority of respondents were in the good category with 40 respondents with a percentage of 74.1%, and respondents in the moderate category were 14 people with a percentage of 25.9%, there were no respondents in the poor category.

Based on the results of the research conducted, it shows that after being given education related to simple wound management using smart box media, the majority of respondents' post-test scores are in the good category level as many as 40 out of 54 respondents with a percentage value of 74.1% while other respondents in the sufficient category are 14 people with a percentage of 25.9%, in the results of this post-test there are no respondents with a poor value category. When conducting questions and answers to re-evaluate the knowledge obtained by respondents, there were 2 children in the first session who said that they already understood the correct sequence when handling simple wounds, there were also respondents who said that after getting information related to simple wound management, they knew that the use of NaCl or other antiseptics was intended to keep the wound clean and replace betadine which was no longer recommended for wound treatment, even though previously they had been treated like the education provided by the researcher but did not know the purpose of giving NaCl. There were also some children from the second session who said that after providing this education, they understood that the wound treatment they had been doing was still wrong because without washing their hands and cleaning the wound, the child had immediately covered the wound with plaster.

In this second session there was a child who asked about his habit of closing wounds with pounded leaves whether it was right and if it was not right then what would happen to him, then the researcher asked again what the name and type of leaf was, but the child answered that he did not know the name of the leaf but he had seen it happen in his neighborhood so the child followed it, after hearing the answer from the child then the researcher explained that if we do not know about the efficacy of the leaf then it should not be carelessly used to close the wound because basically handling the wound must pay attention to the cleanliness of the wound so as not to cause infection.

Based on the results of the evaluation, the researcher argues that after being given Health Education to children with interesting media, one of which is smart box media, it can attract the attention of respondents so that children more quickly understand and absorb the information provided, seen from the statements and post test scores on the respondents obtained.

In line with research conducted by Aminah & Eka (2024) which explains that Smart box media is proven to improve student learning outcomes seen from a significant increase in N-gain scores with an average value of 0.85. Reinforced by research from Yuliasri *et al* (2024) states that smart box learning media obtained material validation results of 92% and media validation results of 94%.

Based on the description above, the researcher argues that the level of children's knowledge related to handling simple wounds can be increased by providing information or Health Education using interesting and creative teaching media, because by using interesting media children become more excited and active in the process of providing Health Education, not only that by using interesting media, one of which is a smart box, it makes children not quickly bored during the education process.

1.2 Bivariate analysis

1.2.1 Bivariate Analysis of the Effect of Health Education for Simple Wound Handling with Smart Box Media on the Level of Knowledge of 4th Grade Children at Sd Negeri Mojosongo 5 Surakarta.

Table 4. The effect of health education on simple wound management with smart box media on children's knowledge level.

Knowledge level	Median (Minimum-Maximum)	P-value
Knowledge Level Before Health Education (n=54)	2 (2-3)	
Knowledge level after health education (n=54)	1 (1-2)	0,000
<i>Negative Ranks</i>	<i>Positive Ranks</i>	<i>Ties</i>
0	47	7

Wilcoxon Test, No Subject Knowledge Decreased, 47 Increased and 7 Fixed.

Based on table 4, the results obtained using the Wilcoxon test show that the level of ability of negative ranks respondents is 0 where there are no respondents with a post test value less than the pre test value, which means that there are no respondents who have decreased their level of knowledge, the level of knowledge of respondents with positive ranks is 47 respondents, which means that the post test value of 47 respondents is greater than the pre test value, which means that their level of knowledge has increased, and respondents whose pre test value is the same as the post test value or called ties are 7 respondents, which means that there are 7 respondents with a level of knowledge that has neither increased nor decreased.

In this study, the p value shows 0.000 where this figure shows that the p value <0.05 , which means H_0 is rejected and H_a is accepted, so it can be concluded that there is an effect of providing health education with Smart Box media on the level of knowledge of health education with Smart Box media on children's knowledge of simple wound management at Mojosongo 5 State Elementary School in Surakarta.

Based on the results of checking the results of the pre and post tests of 7 children who were included in the ties category or the score did not increase or decrease in knowledge, it was found that the correct and incorrect answers to the pre- test question numbers did not change during the post test, while based on the results of the interview 2 children said that they already knew what NaCl was as a substitute for antiseptic because they had experienced an injury and were taken to the health center for treatment and the health center suggested cleaning the wound using NaCl or other antiseptic other than betadine, In this study, the p value showed 0.000 where this figure shows that the p value <0.05 , which means that H_0 is rejected and the results of this study show that NaCl is used as a substitute for antiseptic. 0.05, which means H_0 is rejected and H_a is accepted, so it can be concluded that there is an effect of providing Health Education with Smart Box media on the level of knowledge of health education with Smart Box media on children's knowledge about simple wound management at Mojosongo 5 Surakarta State Elementary School.

Based on the data obtained that at Mojosongo 5 Surakarta State Elementary School, grade 4 children have never received any education related to simple wound management with Smart Box media, so researchers argue that it is necessary to provide health education using media to be able to provide good and correct information for grade 4 elementary school students so that students can independently carry out initial handling of simple wounds to prevent the severity of the wound and to be able to improve the quality of healthy life at school. in line with research conducted by Grygorowicz *et al.*, (2021) Teaching knowledge about first aid in accidents in school children will improve the quality of a better society early on. School Health Effort is a forum for improving the quality of healthy life in schools.

When researchers conducted research using smart box media, the respondents seemed curious about the media used before it was opened, after the respondents filled in the Pre test width and entered the education after the smart box media was opened, the respondents seemed very excited when they saw the contents of the material on the media so that the respondents followed the process of providing health education calmly and smoothly. In line with research conducted by Habibah & Agus (2024) which states that after the application of smart Box media, the results based on the Paired sample t-Test statistical test obtained a sig value. (2-tailed) of 0.000 where the number $t_s < 0.05$, it can be concluded that there is a significant difference in initial knowledge before giving smart box media with children's abilities after being given smart box media.

Based on the description above, the researcher argues that Smart box media is one of the effective media used for providing health education to school-age children, because the shape is unique like a gift box and the contents of the smart box media itself look very attractive so that school-age children become very curious and eager to find out more information about the contents of the smart box itself, seen from the students' response when they saw the smart box for the first time before entering the explanation of simple wound care material, some children had started asking questions related to what was in the box or smart box.

Smart boxes that are designed with bright colors, attractive images and some elements that are made to look embossed make children happy to look towards the smart box, children will feel more excited when their sense of sight is stimulated by giving something that looks colorful and lots of pictures (Fadilah *et al.*, (2024). From this explanation, the researcher argues that the uniqueness of the smart box media makes children feel happy because of the colors and elements that are unusual or they have never seen before, making children more active and participatory in the process of providing health education related to simple wound management.

4. CONCLUSION

- 1) The results of the characteristics of respondents based on age in this study were mostly 10 years old as many as 45 respondents (83.3%), and based on gender characteristics the majority were female with 31 respondents (57.4%).
- 2) The level of knowledge of handling simple wounds with *smart box* media can be seen that in the intervention group before being given Health Education related to handling simple wounds with *smart box* media the majority of respondents were in the sufficient category, namely 33 respondents with a percentage of 61.1%.

- 3) The level of children's knowledge related to handling simple wounds with *smart box* media after being given Health Education related to handling simple wounds with *smart box* media the majority of respondents were in the good category, namely 40 respondents with a percentage of 74.1%.
- 4) In this study, the value of the results of the *p value* shows 0.000 where this figure shows that the *p value*
- 5) <0.05 which means H_0 is rejected and H_a is accepted, so it can be concluded that there is an effect of providing Health Education with *Smart Box* media on the level of knowledge of health education with *Smart Box* media on children's knowledge about handling simple wounds at Mojosongo 5 Surakarta State Elementary School.

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