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The Effect of Splinting Health Education with Audiovisual Media on The Knowledge Level of Splinting

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ABSTRACT

World Health Organization (WHO) states that the condition of traffic accidents in Indonesia is the third highest killer after coronary heart disease and tuberculosis, where this case is estimated to occur in 70% of students. Fractures are potential and actual threats that cause physiological and psychological disorders to a person's pain response. This study aimed to determine the effect of health education in splinting on the level of knowledge by using audiovisual media. The research design used a quasi-experimental method (quasi-experimental) with a non-equivalent control group approach. The sampling technique is simple random sampling, and the number of samples used is 51 respondents. The research instrument used a knowledge-level questionnaire on splinting and audiovisual media. The Wilcoxon sign test and Mann-Whitney analyzed data. The Wilcoxon analysis showed that the p-value in the intervention group was 0.005 < 0.05. And in the control group, the p-value was 0.014 < 0.05. While according to the Mann-Whitney test, the p-value was 0.000 < 0.05, it can be concluded that there is an effect of health education splinting with audiovisual media on the knowledge level of splinting in public senior high school students. The use of video for education is very effective in changing individual knowledge and behavior. Providing education through videos will make it easier to convey information and facilitate behavior change. Besides, videos can increase self-confidence and confidence about the educational material delivered.

Keywords: knowledge; splinting; audiovisual

INTRODUCTION

An emergency is a situation that can endanger a person, so there is a need for immediate help to avoid disability and death (Fabriana et al., 2018). This emergency can come at any time with an unplanned nature. Through these conditions, medical assistance is needed, a separate responsibility owned by health workers. In addition, this emergency requires the community's involvement in providing first aid assistance to emergency victims before medical officers are on the scene—developments in the transportation sector. Especially with improvements in areas such as the number of road users, the number of drivers, the use of public transport services, roads and driving speed are also estimated to have a high risk of traffic accidents that can cause fractures. A fracture is a potential and actual physical and psychological disorder in a person that occurs due to the pain response felt by a person (Romadonia, 2019).

The results of the data on accidents in the school environment that have been carried out in Canada (British Colombia, Vancouver) state that cases of accidents in the school environment occur as many as 1.8% per 100 children, where these cases lead to events that result in sprains, bleeding, fractures. The incidence of concussion with an incident intensity of 0.09% per 100 children (Warouw, 2018). A World Health Organization (WHO) survey states that traffic accidents in Indonesia are the third highest killer after coronary heart disease and tuberculosis; 70% of these cases are estimated to occur in students (Warouw, 2018). According to a survey conducted in 182 countries, the State of Indonesia is in fifth place as a country with a death toll due to traffic accidents. Data from the National Police Headquarters in 2013 recorded traffic accidents in 101,037 cases. These cases show that there are probably 12 cases of traffic incidents every hour (Fitria Ratnasari Lucky T . Kumaat Mulyadi, 2014).

The results of a preliminary study carried out at Public Senior High School (SMAN) 1 Jember to 6 students from 25 who participated in the Youth Red Cross (PMR). Activities showed that the incidence of accidents that caused fractures in the school environment had not been recorded with certainty. Based on the results of interviews conducted

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by researchers about knowledge of splinting, it was stated that students needed counselling regarding fracture treatment information about splints to increase knowledge and information on students. In addition, the lack of information to students regarding the handling of splints is the basis for applying splints in the scope of Public Senior High School (SMAN) 1 Jember.

Health education is an effort made by a person, group, or community to achieve relationships and the capacity for good direction in daily life (Rachmawati, 2019). First aid for school accidents is one of the efforts to provide care carried out as quickly as possible due to events at school (Warouw, 2018). Immediate action is carried out to avoid conditions that can worsen. However, when assisting, usually the helper forgets about the proper procedure for acting so that it can accidentally hurt the victim.

Splinting is one of the aids in the treatment of fractures carried out by trained people. Splinting is the first management method for the musculoskeletal system, which aims to rest parts of the body by using a tool that reduces pain for patients with fractures (Fakhrurrizal, 2015). Good knowledge of splint first aid is essential in providing proper care before medical personnel arrives at the scene. Based on the problems above, the researchers are interested in conducting research with the title "The Effect of Splint Bandage Health Education with Audiovisual Media on the Knowledge Level of Splint Bandages in Students of SMAN 1 Jember".

METHOD

The design of this study was quasi-experimental with a non-equivalent control group approach. The design of this study used a comparison group (control) and a measurement group (intervention). Both groups will be given a pretest questionnaire as a student's measuring value regarding the level of knowledge of splint dressing at the beginning. After that, different interventions will be given. The control group will be given a first aid manual for accidents, while the intervention group will be given splinting material using audiovisual media. After the two groups were given different treatments, the researcher gave a post-test questionnaire regarding the knowledge level of splint dressing. The population of this research is all students of class X and XI of Public Senior High School (SMAN) 1 Jember in the academic year 2021/2022, totaling 687 students. The sampling technique used is probability sampling, namely simple random sampling. Inclusion criteria include active students at Public Senior High School (SMAN) 1 Jember. They are willing to be respondents and active students in classes X and XI in the 2021/2022 academic year at Public Senior High School (SMAN) 1 Jember. The exclusion criteria were students who withdrew and did not participate in the study until the end. This study uses a splint dressing knowledge level instrument that aims to determine the level of splint dressing knowledge using an ordinal scale. This research questionnaire uses a Likert scale type of questionnaire consisting of positive and negative statements totaling 19 questions which show r count > r table 0.4020-0.745, Cronbach-alpha 0.739 (Saputri, 2017). Data collection was carried out from June 20, 2022, to July 20, 2022. Data analysis used the Wilcoxon sign test and Mann-Whitney (p=0.05). This study was declared to have passed the ethical competency test through the KEPK of the Faculty of Nursing, Universitas Jember, with No. 102/UN25.1.14/KEPK/2022.

RESULT

Characteristics of Respondents

Table 1. Characteristics of Respondents

Characteristics	Control Group (n = 26)		Intervention Group (n = 25)	
	Median	Minimum - Maximum	Median	Minimum - Maximum
Age	17	16 - 18	17	16 - 18
Characteristics	Control Group (n = 26)		Intervention Group (n = 25)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Gender				
Male	16	61.5	7	26.9
Female	10	38.5	18	69.2

Based on table 1, the number of respondents was 51 students consisting of 26 control group students and 25 intervention group students in this study, the characteristics of the respondents in the table above explain the characteristics of age and gender. The respondent's characteristic data in the form of age will be presented in the form of median, min, and max. In contrast, the respondent's characteristics in the form of gender will be presented in the form of frequency and percentage. Research respondents in both groups tend to have a median age of 17 years, with the

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e-ISSN: 2798-5067
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youngest being 16 years old and the oldest 18 years old. The number of students in this study was 51 students who were members of the control group and the intervention group, the gender of the control group respondents was dominated by as many as 16 students (61.5%), and ten students (38.5%) were male. Males, while in the intervention group, 18 students (69.2%) were dominated by women and 7 (26.9%) males.

The level of knowledge of splinting prior to health education of splinting with audiovisual media in the intervention group and the control group

Table 2. The level of knowledge of splinting prior to health education of splinting with audiovisual media in the intervention group and the control group

Knowledge Level	Pretest			
	Control Group (n = 26)		Intervention Group (n = 25)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Good	2	7.7	5	20
Enough	17	65.4	14	56
Less	7	26.9	6	24

Table 2 explains the level of respondents' knowledge about splint dressing before the health education of splint dressing with audiovisual media is carried out in the intervention group and the control group. Data presentation is presented in the form of frequency and percentage. The results regarding the knowledge of splint dressing before the health education of splint dressing with audiovisual media in the control group were dominated in the excellent category as many as 17 respondents (65.4%). At the same time, the level of knowledge of splint dressing before the health education of splint dressing with audiovisual media in the intervention group was dominated in the excellent category as many as 14 respondents (56%).

The level of knowledge level of splinting after splinting health education with audiovisual media in the intervention group and control group

Table 3. The level of knowledge level of splinting after splinting health education with audiovisual media in the intervention group and control group

Knowledge Level	Posttest			
	Control Group (n = 26)		Intervention Group (n = 25)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Good	5	19.2	11	44
Enough	17	65.4	10	40
Less	4	15.4	4	16

Table 3 explains the respondents' level of knowledge about splint dressing after splinting health education with audiovisual media in the intervention group and control group. Presentation of data will be presented in the form of frequency. The results regarding the knowledge of splint dressing after splint dressing health education with audiovisual media in the control group were dominated in the excellent category as many as 17 respondents (65.4%). At the same time, the level of splint dressing knowledge after splinting health education with audiovisual media in the intervention group was dominated in the excellent category by as many as 11 respondents (44%).

Volume 2, Number 4 (December 2022)
e-ISSN: 2798-5067
p-ISSN: 2798-5059

Differences in the level of knowledge of splinting before and after splinting health education with audiovisual media in the intervention group and the control group

Table 4. Differences in the level of knowledge of splinting before and after splinting health education with audiovisual media in the intervention group and the control group

Variables	Pretest	Posttest	p-value
Knowledge of Splints Control Group (n=26)			
Good	2	5	0.014
Enough	17	17	
Less	7	4	
Knowledge of Splints Intervention Group (n=25)			
Good	5	11	0.005
Enough	14	10	
Less	6	4	

Table 4 shows the Wilcoxon Signed Rank test results regarding differences in the level of knowledge of splints at the pretest and posttest in the intervention group, with a p-value of 0.005 < 0.05. It can be concluded that there are differences in the provision of splint health education interventions with practical and effective audiovisual media. Affect the level of knowledge of splint dressing, seen from the results of differences in the increase in each category of the knowledge level of splints between before and after the intervention. The table above also shows the results of differences in the control group's level of knowledge of splints during the pretest and posttest, with a p-value of 0.014 <0.05. It can be concluded that there are differences in the provision of health education treatment with splints with media giving practical modules and affects the level of knowledge of splint dressing. The differences in the results of the increase in each category of the knowledge level of splint dressing between before and after the treatment were given.

Differences in the level of knowledge of splinting after the health education of splinting with audiovisual media in the intervention group and the control group

Table 5. Differences in the level of knowledge of splinting after the health education of splinting with audiovisual media in the intervention group and the control group

Variable	Posttest	p-value
Posttest Control Group (n=26)		
Good	5	
Enough	17	
Less	4	0.000
Posttest Intervention Group (n=25)		
Good	11	
Enough	10	
Less	4	

Table 5 explains the difference in respondents' level of knowledge about splint dressing after splinting health education with audiovisual media in the intervention group and the control group, which is carried out by displaying the results of the Mann-Whitney test. The results show that Ha is accepted, and Ho is rejected with a p-value of 0.000 <0.05, which means that there is a difference in the level of knowledge of splints in the intervention group. The control group can be concluded that there is a significant influence on the knowledge of splint dressing after the health education of splints is given. They are using audiovisual media in the intervention group and the control group.

DISCUSSION

Characteristics of Respondents

In this study, the age of the respondents had a median of 17 years, with the respondent age range being 16-18 years. This age is the age group at the youth level (Kementerian Kesehatan RI, 2017). Adolescents have high curiosity, described by their enthusiastic attitude in observing, listening, seeking, and exploring new information. This curiosity gives adolescents confidence and motivation to increase their knowledge and further explore what they want to know

Volume 2, Number 4 (December 2022)
e-ISSN: 2798-5067
p-ISSN: 2798-5059

(Nugroho, 2019). Teenagers also have specific characteristics, such as a great desire to try things that are not yet known and excessive self-confidence, along with their emotional possessions (Nugroho, 2019). The researcher assumes that the age of the research respondents is in their teens, where the characteristics possessed by the respondents are almost the same as teenagers in general, namely having a high curiosity and indicated by the high level of enthusiasm of the respondents in participating in the research.

The majority of respondents in this study were women. This was motivated by data from the school in the 2021/2022 school year class X and XI that the number of female students of SMAN 1 Jember was more than that of male students, namely male students. With female sex, they are totaling 428 students, and students with male sex totaling 265 students. However, when viewed from the population by age and gender, it is found that the population in the age range 15-19 years has a more male population than female population (Badan Pusat Statistik, 2021). Gender characteristics have particular learning styles in responding to the material, whereas women are generally better at remembering information (Ekawati & Wulandari, 2011). However, this contrasts with other studies, which state that gender characteristic are not limited to responding to information and curiosity in male and female students (Raharja et al., 2018). Researchers assume that women dominate the number of respondents in this study, but gender cannot be used as a determinant in capturing information and the learning process.

The level of knowledge of splinting prior to health education of splinting with audiovisual media in the intervention group and the control group

Based on the research results on 51 respondents, it was found that the level of knowledge of splinting before health education was carried out with audiovisual media in the intervention group and the control group. On average, they had sufficient knowledge, with a percentage of the intervention group as many as 14 respondents (56%) and the control group as many as 17 respondents (65.4%). The study's results align with research by Rolly et al. (2020). They explained that the level of knowledge before health education was carried out in the intervention group got an average value of 7.03. In contrast, the control group's level of knowledge before health education was carried out had an average value of 5.57 (Rondonuwu et al., 2020). Another study explained the effect of splinting training on the knowledge and skills of adolescent red cross (PMR) students at Public Senior High School 4 Bengkulu City before being given splinting health education had sufficient knowledge in the category of 12 respondents (36.4%). Moreover, the skills of respondents before being given health education with splints on average in the good category of 21 respondents (63.6%) (Listiana, Devi, 2019).

The level of knowledge is influenced by age, education level, occupation, interests, surrounding culture, individual experience, and information (Siswoyo et al., 2018). Another opinion explains that the factors influencing knowledge are education, economy, exposure to mass media, social relations, and personal experience (Shen, Li, Farid, Hany, Mcpeek, 2008). The researcher assumes that the average value of knowledge prior to health education in splint dressing is in the excellent category for someone who has never received health education or attended splint dressing training. The sufficient knowledge of the respondents may be influenced by five factors that can affect a person's knowledge, namely education, media exposure, economics, social relations, and experience. These five factors become one thing that allows respondents to have sufficient knowledge even though health education has not been carried out.

The level of the knowledge level of splint dressing after splint dressing health education with audiovisual media in the intervention group and control group

Based on the results of the study, it was explained that the level of knowledge of splint dressing after splinting health education with audiovisual media in the intervention group and control group was that the average respondent in the intervention group knew an excellent category with a percentage of 11 respondents (44%). In comparison, in control, average respondents have sufficient knowledge, with a percentage of 17 respondents (65.4%). This study's results align with research by Rolly et al. (2020). They explained that the intervention group's level of knowledge after health education got an average value of 13.77. In contrast, the control group's level of knowledge after health education got an average value of 6.83 (Rondonuwu et al., 2020). Another study explained that the effect of splint dressing training on the knowledge and skills of adolescent red cross (PMR) students at SMAN 4 Bengkulu City after being given splint dressing health education showed that the average respondent had sufficient knowledge in the category of 19 respondents (57.6%). Moreover, respondents' skills after being given health education in splints on average in the good category of 20 respondents (60.6%) (Listiana & Oktarina, 2019). Another study showed that the average value of attitudes towards preventing dengue hemorrhagic fever before giving health promotion through the video method was 49.61 and the average value of attitudes after being given an intervention through health promotion videos was 59.14 (Aisyiah et al., 2021).

Volume 2, Number 4 (December 2022)
e-ISSN: 2798-5067
p-ISSN: 2798-5059

They were filling out a questionnaire regarding the knowledge of splint dressing in the intervention and control groups after health education had generally increased. The number of scores between the intervention and control groups will then be ranked from high to low by the researcher by looking at the number of means and standard deviations. Where from the results of the calculation, it was found that the first question data with the highest score was in the group of questions on the principle of dressing and splinting. The second group of questions, namely the group questions on complications of dressings and splints, and the third group of questions, the question group of various splints. The fourth question group is in the question group for the splint, and the fifth question group is in the question group for the definition of the splint.

Meanwhile, in the control group after the health education, the first question group with the highest score was the group of questions on complications of dressings and splints—the second group of questions, namely the question of the principle of dressing and splinting. The third group of questions is the question group of various splints. The fourth question is in the group of questions on the definition of splints, and the fifth question group, namely in the group of questions about the purpose of the splint.

The researcher assumes that the knowledge of splint dressing in the intervention group after the splint health education is in the excellent category, and the control group after the splint health education is in a suitable category. This can be seen from the ranking of the question groups where in the intervention group, the question group with the highest score is the question group regarding the principles of dressing and grooming, while the lowest score is in the question group for the definition of splints. Furthermore, in the control group, the ranking results for the question group with the highest score were regarding complications of dressings and splints, while the lowest score was in the question group regarding splints.

Differences in the level of knowledge of splinting before and after splinting health education with audiovisual media in the intervention group and the control group

The difference in the level of knowledge of splinting in the intervention group at the time of the pretest and post-test is that the p-value is 0.005 <0.05. Be concluded that there is an effect of providing health education interventions with splinting with effective audiovisual media affects the level of knowledge of splinting. The results of differences in the increase in each category of the knowledge level of splinting before and after the intervention. While a difference in the level of knowledge of splinting at the pretest and post-test in the control group with a p-value of 0.014 <0.05. Be concluded that there is an effect of providing health education treatment with splinting with media providing a practical module and influencing the level of knowledge of splinting. We have seen the differences in the increase in each category of the knowledge level of splinting before and after the treatment.

Students' lack of knowledge is due to the lack of exposure to information regarding the management of splinting. Knowledge itself results from knowing, which occurs after a person has sensed a particular object. Cognitive knowledge is a critical domain for the formation of one's actions. A person is said to understand if he has been able to explain a known object (Notoadmodjo, 2007). Learning media is an external factor that can affect learning outcomes (Hikmawati, 2013). Learning media is one of the means for teachers to clarify the material presented. The best learning is by experiencing something that uses the five senses, and one alternative implementation is by learning using audiovisual media (Riyanto, 2009).

The video method for providing education is very effective in causing changes in personal knowledge and behavior. This is due to the video method's efficiency in teaching someone knowledge. The results of other studies say that the video method significantly differs from the lecture method (Rondonuwu et al., 2020). Another study explains that there is an effect on health promotion through animated videos on adolescent knowledge regarding drug abuse in the Kampung Tengah area, East Jakarta (Sri Nurani et al., 2022). Using audiovisual sources allows for more effective capture. It arouses curiosity about the topic because people live in a culture where visual abilities and the ability to process information are continuously practiced (Junior & Rebougas, 2017). Other studies explain that providing education through videos will make it easier to convey information and facilitate behavior change. Besides, videos can increase self-confidence and confidence about the educational material delivered (Abed et al., 2014). Researchers assume that the knowledge of splint dressing before and after splinting health education has a significant influence. The provision of audiovisual media to the intervention group can provide more knowledge and information to respondents so that the research respondents' knowledge level shows a change before and after being given health education.

Volume 2, Number 4 (December 2022)
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Differences in the level of knowledge of splinting after the health education of splinting with audiovisual media in the intervention group and the control group

Based on the results of research that researchers have carried out, it is found that the difference in the level of knowledge after health education is carried out in the intervention group and the control group, which has been tested with Mann-Whitney statistics. The test results show the p-value 0.000 <0.05. This means that in this study, none of the respondents experienced a decrease in knowledge, but all respondents experienced an increase in knowledge. This shows that the intervention or treatment in the form of health education in splints with audiovisual media gave significant results in each group.

In line with the results of research that has been carried out by Rolly et al. (2020), which explains the results of the difference in knowledge scores in two groups who received lecture and leaflet model education with lecture and video models in their research got p = 0.000 (p-value < 0, 00) (Rondonuwu et al., 2020). Through this explanation, it can be concluded that there is an effect of splint dressing training on students' knowledge. The ability of students to remember information or material is different. Basic knowledge and understanding of splint dressing are essential for individuals to provide emergency care in the event of a disaster or accident, possibly saving lives and minimizing injury. The better a person's knowledge, the more actions taken will be more organized or organized (Nursalam & Efendi, 2008). Based on the explanation above, the researcher assumes that students' understanding of splint dressing management information is influenced by students' ability to remember the information provided. Understanding this information can impact attitudes that are formed and more organized toward the concept of splint dressing management to minimize the increasing number of fractures in the community that can endanger lives.

LIMITATIONS

The limitation of this study is that the researcher cannot directly supervise the respondents during filling out the questionnaire and giving interventions to the two groups. This is because the researcher conducts research online (online) through WhatsApp groups by distributing questionnaires via google Forms and providing interventions via google drive. However, a researcher has asked for help from the vice principal student from the school as the liaison between researchers and respondents to monitor if there are obstacles during research.

CONCLUSION

The respondents in this study were students of SMAN 1 Jember, with the majority aged 17 years, and most of the respondents were female. The knowledge of splint dressing before the health education of splint dressing with audiovisual media in the intervention group and control group was concluded to have a sufficient level of knowledge. The level of knowledge of splint dressing after splint dressing health education with audiovisual media in the intervention group and control group can be concluded that the average number of respondents in the intervention group has good knowledge. After the splint dressing, health education is carried out, while the control group has a high level of knowledge with a good category. The difference in the knowledge of splint dressing before and after splint health education with audiovisual media concluded that there was an effect of providing splint health education interventions with audiovisual media.

Meanwhile, the results of differences in the level of knowledge of splints at the time of the pretest and posttest in the control group showed that there was an effect of providing health education treatment with splints with media giving practical modules and affecting the level of knowledge of splints. The difference in the level of knowledge of splints in the intervention group and the control group after the health education of splints with audiovisual media results from this test showed a significant influence on the level of knowledge of splints after the health education of splints was given to the intervention group and the control group. This study has limitations. Namely, researchers cannot directly supervise respondents during filling out questionnaires and giving interventions to both groups. Because the research was conducted online (online) through WhatsApp groups; therefore, further research is expected that there will be assistance regarding filling out questionnaires and providing interventions. During the research. In addition, researchers hope that there will be similar studies regarding the level of knowledge of splint dressings by developing comparisons with other methods or media in the future.

Volume 2, Number 4 (December 2022)
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