

The influence of MEDULA (Education Media for Snakes and Ladders) on adolescent knowledge levels on reproductive health

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ABSTRACT

Adolescents have a distinctive characteristic of great curiosity to take risks without careful consideration. This makes teenagers enter susceptible to perform behaviors such as pre-marital sexual behavior which bring many negative effects, physically, psychologically, and socially. Therefore, it is required the availability of reproductive health services that are friendly and appealing to teenagers, such as a playful education by using the ladder snake games, so that the respondents catch much information is submitted. This study was tried to determine the effect of health education with the ladder snake games to students' knowledge level about adolescent reproductive health. This quasi-experimental study used pre-posttest design with control group. The sample used was 116 students in the secondary school, selected through the total sampling method. Instruments in this study used questionnaires that its validity and reliability had been tested. As well as ladder snakes measuring 2x2 meters. Data were analyzed by nonparametric Statistic test. Wilcoxon test showed a significance value of 0.000 ($p < 0.05$) which means there are significant differences in the intervention group before and after health education with snake ladder. This research concluded that there was ladders snake game influence to the students' knowledge about adolescent reproductive health.

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1. Introduction

Adolescence is a period of rapid growth and development, physically, psychologically, and intellectually. Based on data from the Ministry of Health Republic of Indonesia, the age group of 10-19 years in Indonesia in 2020 was 75.49 million or around 27.94% of the total population (2020 Population Census Results., 2020) Related to this, adolescents are known to have distinctive characteristics, namely great curiosity, like adventure and challenges, and tend to be brave enough to take risks without being preceded by careful consideration. These traits transform adolescents as a population that is vulnerable to health problems. The developing reproductive organs of adolescents and their great curiosity encourage adolescents to try negative behaviors such as premarital sexual behavior (Alfiasari & Oktriyanto, 2019).

Many adolescents aged 15-19 have had children, especially in developing countries and married before 18. The high rate of marriage at a young age and the large number of pregnant women under 20 years are mostly due to premarital pregnancy. Premarital sexual behavior has many risks, such as pregnancy in adolescence and infection with sexually transmitted diseases. Psychologically, adolescents will feel anxious and inferior immediately after being in this situation. In addition, other

impacts will be received include exclusion, dropping out of school—especially for pregnant adolescents, and sudden changes in roles as parents. The incidence of premarital sexual behavior is caused by several factors, for example the low level of information dissemination (Haruna et al., 2018; Shaluhayah, 2017; Wong, 2017).

Lack of knowledge, nature, and risky behavior for adolescents that have an impact on reproductive health status requires the availability of health services that meet the health needs of adolescents, especially services for reproductive health that are friendly to adolescents (Prayuni et al., 2018). Currently, several methods of health education regarding adolescent reproductive health have been developed, including lectures and discussions, focus group discussions, games and peer groups (Ambrose, 17 C.E.; Haruna et al., 2018, 2019; Nyumba, 2018). Meanwhile, one of the health education methods that we would like to highlight here is a method that uses the snake and ladder playing technique. In the previous research which directed, the game of snakes and ladders has been proven to transform a passive learning atmosphere to become active and children become cheerful, which makes them able to capture more information (Berg et al., 2019). This learning technique has been used so that learning objectives can be achieved effectively and efficiently in a happy atmosphere even though discussing difficult things (Raiyn, 2017; Sites, 2016). Furthermore, the purpose of this study was to determine whether health education with MEDULA (Education Media for Snakes and Ladders) had an effect on the level of knowledge of adolescents about reproductive health.

2. Method

This research was a quasi-experimental study with a prepost test design with a control group, which divided the research respondents into intervention and control groups by being given a pre-test and post-test. The pre-test and post-test implementation of this study were given a distance of 16 days. If the time interval is too short, it is likely that the respondent still remembers the questions on the first test, and if it is too long then it is likely that there has been a change in the variable to be measured. The population in this study were 116 junior high school students (Sirani, 2016; Widyaningsih et al., 2018). Furthermore, the sampling technique in this research was nonprobability sampling with a total sampling method that is using the whole subject. The data was collected using a demographic data questionnaire and a knowledge level questionnaire that had been tested for validity and reliability. In addition, we used a 2x2 meter snake and ladder game media and dice in order to practice the learning method.

After the data had collected, the data were analyzed using univariate and bivariate analysis. The univariate analysis of this study resulted in frequency and percentage distributions for categorical types (age, gender, source of knowledge) and central tendency for numerical data including mean, median, standard deviation, minimum and maximum (knowledge scores before and after intervention in both groups). Meanwhile, the bivariate analysis that had used was the Wilcoxon test—to see the level of knowledge before and after in the intervention and control groups—and the Mann Withney test—to see the differences in the level of knowledge between the intervention and control groups (Morales-Martínez et al., 2021; Oliveira et al., 2016). This research gained ethical approval from Universitas Muhammadiyah Yogyakarta Research Ethical Board with reference number 521/EP-FKIK-UMY/IX/2017.

3. Results

3.1. Univariate Analysis

3.1.1. The Respondent Characteristic

The number of students used as samples in this study amounted to 116 students. Characteristics of respondents in this group include age, gender, and never / never received reproductive health information. Respondent characteristic data is presented in the following table:

Table 1. Respondent characteristics

Respondent Characteristics	Intervention	%	Control N	%
Age (years old)				
12	1	1.7	4	6.9
13	41	70.7	32	55.2
14	14	24.2	20	34.5
15	2	3.4	2	3.4
Gender				
Male	32	55.2	32	55.2
Female	26	44.8	26	44.8
Received SRH Education				
Yes	28	48.3	27	46.6
No	30	51.7	31	53.4
Total	58	100	60	100

The characteristics of the most respondents based on age were 13 years old, namely 41 students (70.7%) in the intervention group and 32 students (55.2%) in the control group. Based on gender, the majority were male, namely 32 students (55.2%) in the control group intervention group. Most of the students in this study had never received information related to adolescent reproductive health, namely 30 students (51.7%) in the intervention group and 31 students (53.4%) in the control group.

3.1.2. The difference in the level of knowledge before health education with MEDULA between the intervention and control groups.

Table 2 shows the result of knowledge level difference test during pre-test in the intervention and control groups with Mann Whitney.

Table 2. The Result of Knowledge Level Difference Test During Pre-test in the Intervention and Control Groups with Mann Whitney

Group	Pre-Test		
	N	Median (min-max)	P
Intervention	58	17 (14-20)	0,915
Control	58	18 (7-21)	

Source: Primary Data 2017

The test results obtained a significance value of 0.915 ($p > 0.05$) which indicated that the two groups had the same level of initial knowledge so that the two groups were worthy to be compared.

3.2. Bivariate Analysis

3.2.1. The difference in the level of knowledge before health education with MEDULA between the intervention and control groups.

Table 3 shows the result of knowledge level difference test during pre-test in the intervention and control groups with Mann Whitney

Table 3. The Result of Knowledge Level Difference Test During Pre-test in the Intervention and Control Groups with Mann Whitney

Pre-Test			
Group	N	Median (min-max)	P
Intervention	58	17 (14-20)	0,915
Control	58	18 (7-21)	

Source: Primary Data 2017

The test results obtained a significance value of 0.915 ($p > 0.05$) which indicated that the two groups had the same level of initial knowledge so that the two groups were worthy to be compared.

3.2.2. The difference in the level of knowledge after health education with MEDULA between the intervention group and the control group

Table 4 shows the results of students' knowledge level differences test at post-test in the intervention and control groups with the Mann Whitney Test.

Table 4. The Results of Students' Knowledge Level Differences Test at Post-test in the Intervention and Control Groups with the Mann Whitney Test

Post-Test			
Group	N	Median (min-max)	p
Intervention	58	20 (16-21)	0,000
Control	58	19 (14-21)	

Source: Primary Data 2017

The results of the Mann Whitney test showed a significance value of 0.000 ($p < 0.05$) which meant that there was a significant difference in the post-test between the intervention group and the control group.

3.2.3. The level of knowledge of students before and after being given health education with MEDULA in the intervention group

Table 5 shows Wilcoxon test results students' knowledge levels during the pre-test and post-test in the intervention group

Table 5. Wilcoxon Test Results Students' Knowledge Levels during the Pre-Test and Post-Test in the Intervention Group

Intervention Group			
Test session	N	Median (min-max)	p
Pre-Test	58	17 (14-20)	0,000
Post-Test	58	20 (16-21)	

Source: Primary Data 2017

Table 5 shows a significance value of 0.000 ($p < 0.05$), which meant that there was a significant difference in the level of knowledge before and after health education with MEDULA in the intervention group.

3.2.4. The level of knowledge before and after health education with MEDULA in the control group

Table 6 shows Wilcoxon Test results student's level of knowledge during pre-test and post-test in the control group.

Table 6. Wilcoxon Test Results Student's Level of Knowledge during Pre-Test and Post-Test in the Control Group

<i>Test session</i>	Control Group		
	<i>N</i>	<i>Median (min-max)</i>	<i>p</i>
Pre-Test	58	18 (7-21)	0,001
Post-Test	58	19 (14-21)	

Source: Primary Data 2017

The test results showed a significance value of 0.001 ($p < 0.05$), which meant that there was a significant difference in the level of knowledge between before and after health education and MEDULA in the control group.

4. Discussion

Based on our findings, when the intervention group in this study was provided with health education through Powerpoint and the snake and ladder game (MEDULA), there was an effective transfer of information to the participants in this group. We encountered this, first, when respondents in the intervention group saw and paid close attention to adolescent reproductive health material through Powerpoint. This was inseparable from the design of the Powerpoint material that used easy-to-understand sentences, some colors and animations that support the material, and images on each slide to explain each word or sentence. Apart from Powerpoint, respondents were also given material through the snake and ladder game. The use of snakes and ladders in this study contains elements of play and aims in order to encourage respondents to learn about what they did in the game (Berg et al., 2019). Which refers to our findings, this further strengthens the participants' efforts in capturing the health education material we imply. The process of implementing this method itself began with the division of students into many teams. Furthermore, the researcher gave questions to each box of snakes and ladders and explained to the participants after answering the questions. Each team will get points for each question answered correctly and the team that answers the most questions correctly would be awarded a prize. This feedback activity was implemented in order to make respondents get solid explanations for questions that had not been answered correctly before.

In this study, although the control group was not involved in the snake and ladder educational media activity (MEDULA), we saw that the participants in this group still experienced a significant increase in knowledge, mean of knowledge level in control group in post test is 17,38, compared with intervention group which have mean (Ayele & Amare, 2020). This meant that there were other factors that influenced it. The factors that influenced the increase in students' knowledge, first, came from how health education through Powerpoint could effectively accommodate the basic needs of participants to absorb new knowledge. By getting the material that was exactly as received by students in the intervention group, students in the control group paid close attention during the process of giving the material. This made Powerpoint media still able to provide optimal effect on the control group. Regarding these findings, (Suratno, 2020) previously admitted that the effectiveness of teaching using visual tools was indeed influenced by its character which was able to streamline communication in conveying certain points of thought. This also strengthens the evidence that visual tools such as PowerPoint has the advantage of being able to create interactions between children and the media, which will stimulate children's curiosity and interest in what they are learning (Sites, 2016), which in turn, could make the material absorbable by the participants. Furthermore, to support this process, we also enforced a pre-test and post-test implementation policy so that they are separated for 16 days. As for us, providing that long distance allowed respondents to seek information from various sources, such as health books, ask family questions, ask friends, or open the internet on the basis of questions asked in the pre-test regarding adolescent reproductive health. By this strategy, even though the control group did not get health education with the snake and ladder education media (MEDULA),

the mean score of knowledge on the post-test of participants in the control group was proven to be able to increase.

However, our research still proved that there was a big effect of increasing students' knowledge regarding adolescent reproductive health with MEDULA on the level of knowledge. We found this through a significant difference in post-test scores between the intervention group and the control group, where the mean score of the knowledge level of the intervention group was higher than the control group. In previous research, the snake and ladder game was known as an effective learning strategy for conveying and applying a lot of information (Suratno, 2020). This was because in this game there had been many messages in the form of writing, letters, pictures, and symbols that encouraged participants to involve more than one of their five senses to interpret them (Nachiappan, 2017; Prayuni et al., 2018). In other study, the simulation method with the game of snakes and ladders had been shown to be able to make a passive learning atmosphere become active which allowed them to capture more information effectively and efficiently though they had been discussing difficult things (Annamalai et al., 2015; Martín-García et al., 2020; Nachiappan, 2017). The success of learning by including play activities could not be separated from the conceptual impact of the method as explained by Mezak & Pejic-Papak (Dlab et al., 2020). According to them, the method of playing while learning, first, is able to motivate participants to understand the material. This then encourages participants to be involved in fulfilling certain achievements in the game process. After the process, the participants who were involved were encouraged to reflect on the material points that was obtained from the series of games.

Subsequently, the attractiveness of this method is believed to be able to replace traditional techniques which was boring, namely when the presenters only encourage participants to listen to the material classically. Moreover, in addition to offering these elements, this method encourages participants to impart the main ideas of the game material through game interactions between participants. At this point, the participants are expected to be able to embody these material ideas into their daily lives, armed with the internalization of their role in achieving achievements in previous game activities. This is as the conceptual basis for learning and playing method that encourages participants to critically perceive challenges in games as reality (Fan & Xiao, 2015; Farre et al., 71 C.E.; Oliveira et al., 2016).

5. Conclusion

The characteristics of the respondents in this study were mostly 13 years old and had never received reproductive health information. At the testing stage we conducted, the level of knowledge before being given health education with MEDULA (pre-test) between the intervention and control groups was not significantly different, with a value of $p = 0.915$ ($p > 0.05$). Meanwhile, the level of knowledge after being given health education with MEDULA (post-test) between the intervention and control groups itself experienced a significant difference, with a value of $p = 0.000$ ($p < 0.05$). Furthermore, the knowledge of students in the intervention group who were given health education with MEDULA showed a significant increase in knowledge, with a value of $p = 0.000$ ($p < 0.05$). On the other hand, the knowledge of the control group who was given health education showed an increase in knowledge, with a value of $p = 0.001$ ($p < 0.05$). Overall, we see that learning techniques with games, in this case using snakes and ladders, have a more significant impact on participants being able to absorb extension materials, when compared to learning activity that only utilizes the lecture method—even though it has adapted visual presentation technology such as Powerpoint.

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