



Original Research

The Effectiveness of Role Play on Knowledge and Skills of Spinal Injury Indications Evacuation Improvement

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ABSTRACT

Background: Spinal injuries are paralysis-causing injuries caused by trauma or disease processes. Members of the Youth Red Cross still have limited knowledge and abilities when it comes to evacuating signs of spinal cord injury. When it comes to performing first aid, knowledge and abilities are crucial. The role-playing approach is one of the methods used to improve knowledge and abilities. The research aimed to find out the effectiveness of role plays in developing knowledge and evacuation skills of spinal cord injury signs in SMAN 1 Ngemplak Youth Red Cross members.

Methods: This study used a quasi-experimental design with a control group and a pretest-posttest design. Purposive sampling was employed using a sample of 40 respondents who were divided into two groups: 20 respondents in the control group and 20 respondents in the intervention group. A questionnaire and an observation sheet were utilized as part of the research instrument. On the knowledge variable, the independent t-test was utilized, and on the skill variable, the Mann-Whitney test was used.

Results: Between the control and intervention groups, there were substantial differences in knowledge and skill factors. This is demonstrated by a significance value of 0.01 in the knowledge variable and a significance value of 0.023 in the skills variable.

Conclusion: For Youth Red Cross SMAN 1 members, role play was effective in developing knowledge and skills of the evacuation of spinal cord injury indicators.

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INTRODUCTION

Spinal cord injury (SCI) is damage to the nerve bundle and fibers extending from the lower part of the brain down through the lower back (NINDS, 2023). The overall injury prevalence rate in Central Java at school age is 13.71%, while the prevalence rate

for spinal injuries that occur during activities at school is 3.07%. Meanwhile, the prevalence of spinal injuries occurring at school age in Boyolali Regency is 6.61% (Kemenkes RI, 2018).

Spinal cord injury is a condition where a person experiences physical changes so that, in carrying out their activities, they need the help of other people as they experience paralysis. The more severely a person experiences a spinal fracture, the greater the effects of dysfunction that person will experience (Swannjo & Suyasa, 2020). Factors that cause spinal cord injuries include traffic accidents, falls, and sports-related injuries, with the order of locations most affected being the cervical, thoracic, lumbar, and least sacral areas (Munawarah et al., 2019; Sudadi & Zaki, 2018).

Based on age, injuries that occur at school are influenced by several factors. In male students, it was found that the causes of serious injuries were broken bones due to falling down the school stairs, burns, and lacerations while participating in sports at school. Meanwhile, the types of serious injuries experienced by female students are more often caused by tailbone fractures due to falls, bruises, and lacerations related to sports (Usman et al., 2021).

First aid is the first action at the scene of an accident or disaster before receiving further treatment at the hospital. The objective of this action is to speed up recovery for victims, prevent disability, and increase life expectancy. First aid efforts for survivors with spinal injuries are using the log roll evacuation technique (Kase et al., 2018). The log roll technique is an evacuation technique that is carried out by tilting the client's body and maintaining it in a straight, parallel position at all times using flat media such as a wooden board or long spinal board.

This technique requires 2–5 people (Rifai & Ilyas, 2019). In the school setting, the authority to provide first aid rests with the members of the Youth Red Cross. Unfortunately, in the initial interview, it was found that even though they had received previous training, this was not balanced with ongoing training and a lack of experience providing direct first aid, which resulted in their knowledge and skills being less than optimal.

Role play is a learning method involving respondents in learning together so that it can increase respondents' creativity and expression in expressing their imagination without movement limitations. With role-playing, the learning atmosphere becomes more lively. This method is practiced directly with respondents (Nurhasanah et al., 2016).

Research related to the use of this method in first-aid training is quite common. However, the use of this method in specific first-aid training for suspected spinal cord injury patients in school settings is quite rare. Therefore, this research aimed to identify whether the roleplay method was effective in increasing the knowledge and skills of evacuating patients with indications of spinal cord injury among the Youth Red Cross members.

MATERIALS AND METHOD

Study Design, Sample, and Settings

This research conducted a quasi-experimental design with a pretest-posttest with a control group design on 40 members of the Youth Red Cross at Ngemplak 1 State High School in Boyolali as respondents. The selection of respondents was carried out using a purposive sampling technique involving only tenth and eleventh-grade teenage Red

Cross members who were willing to be respondents and completed the. Respondents were divided equally into the experimental group and the control group.

Instrument

The level of knowledge regarding the evacuation of patients with indications of spinal cord injury was assessed using a knowledge questionnaire. The questionnaire consists of 20 questions created by researchers, in the form of multiple choices with "right" and "wrong" answer options. The validity test of the knowledge questionnaire showed that the results of this questionnaire were valid, with a r_{count} of 0.432-0.750 ($> r_{\text{table}}$ 0.432).

This questionnaire has also been proven reliable, with a Cronbach's alpha value of 0.669. First aid skills are measured using an observation sheet made based on standard operating procedures. The observation sheet contains the respondent's personal data and standard operational procedures for evacuating log rolls. The observation sheet is filled in by marking a checklist (P) in the column with a value of 2 if the action is carried out correctly, a value of 1 if the action is carried out but not quite right, and a value of 0 if the action is not carried out.

Data Collection

Data collection was carried out after an ethical test letter was issued from the Health Research Ethics Committee of Dr. Moewardi Hospital, Surakarta. All respondents were given an explanation about the course of the research as well as their rights and obligations while participating in the research, then asked to sign informed consent as proof of their willingness to become respondents. Observation methods, interviews, and questionnaires are data collection methods used by researchers.

Observations were used to observe geographical problems in Ngemplak District; interviews were conducted with the Youth Red Cross supervisors at Ngemplak 1 High School to identify the learning methods applied during the Youth Red Cross activities; and questionnaires were distributed to the Youth Red Cross members to determine the respondents' knowledge when encountering incidents of survivors with indications of spinal cord injury. The experimental group received training using the roleplay method, while the control group received training using the conventional method.

Statistical Analysis

Research data was processed using the SPSS 25 program. Univariate analysis uses respondent characteristic variables such as gender, age, and length of participation in the Youth Red Cross. This also explains the pre-test and post-test scores on the knowledge and skills variables. Bivariate analysis is used to test the hypothesis. For the test of the difference between two paired means, the data in the experimental group used the dependent t-test because it was normally distributed, while in the control group, the Wilcoxon test was used because the data was not normally distributed. Test the difference between two unpaired means on the level of knowledge using the independent t-test and on skills using the Man-Whitney test.

RESULTS

The univariate analysis results describe the frequency distribution based on age, gender, and length of participation. According to their age, the majority of respondents are 16 years old, both in the experimental group (50%) and the control group (60%). All of the respondents in the experimental groups were female (100%), while in the control

group, 95% of respondents were also female. According to their duration as an organization member, the majority of respondents in the experimental group (60%) have been members for 19 months, while in the control group, 65% of respondents have been members for 7 months (table 1).

Table 1. Respondents Characteristic

Characteristics	Frequency (%)		
	Experimental group (n=20)	Control Group (n=20)	
Age	15 yo	5 (25%)	2 (10%)
	16 yo	10 (50%)	12 (60%)
	17 yo	5 (25%)	6 (30%)
Gender	Male	0 (0%)	1 (5%)
	Female	20 (100%)	19 (95%)
Duration of Participation	7 monts	8 (40%)	13 (65%)
	19 months	12 (60%)	7 (35%)

The results of the univariate analysis also present data on changes in the level of knowledge and skills in the experimental and control groups (Table 2).

Table 2. Pre and Post Level of Knowledge and Skill

Characteristics	Frequency (%)				
	Experimental group (n=20)		Control Group (n=20)		
	Pre	Post	Pre	Post	
Knowledge Level	Good	7 (35%)	19 (95%)	9 (45%)	14 (70%)
	Fair	13 (65%)	1 (5%)	10 (50%)	5 (25%)
	Poor	0 (0%)	0 (0%)	1 (5%)	1 (5%)
Skill Level	Good	8 (40%)	16 (80%)	0 (0%)	12 (60%)
	Fair	8 (40%)	4 (20%)	4 (20%)	8 (40%)
	Poor	4 (20%)	0 (0%)	16 (80%)	0 (0%)

The level of knowledge in the experimental group before the intervention was carried out showed that 7 (35%) respondents were in a good category, 13 (65%) were fair, and 0 (0%) were poor. After the intervention, knowledge in the control group increased, with 19 (95%) respondents in the good category, 1 (5%) in the fair category, and 0 (0%) in the poor category. Meanwhile, in the control group, before the intervention, respondents in the good knowledge category were 9 (45%), 10 (50%) were fair, and 1 (5%) were poor.

After the intervention was carried out, the knowledge of respondents in the control group increased, with 14 (70%) in the good category, 5 (25%) in the fair category, and 1 (5%) in the poor category. Evacuation skills indicative of spinal cord injury in the experimental group before intervention were categorized as good at 8 (40%), fair at 8 (40%), and poor at 4 (20%). After the intervention was carried out, the skills of respondents in the experimental group increased, namely 16 (80%) in the good category, 4 (20%) in the fair category, and 0 (0%) in the poor category.

Meanwhile, in the control group, evacuation skills before the intervention were carried out in the fair category 4 (20%) and 16 (80%) were in the fair category. After the

intervention, the skills of respondents in the control group increased, namely 12 (60%) in the good category, 8 (40%) in the fair category, and 0 (0%) in the poor category (Table 2). The result of the analysis of pre- and post-intervention knowledge and skill level changes is presented in Table 3.

Table 3. Comparison of Knowledge and Skill Levels of the Experimental Group and the Control Group

Characteristic		N	Mean	Pvalue
Knowledge Level	Experimental Group	20	2,95	0,010
	Control Group	20	1,25	
Skill Level	Experimental Group	20	24,5	0,023
	Control Group	20	16,5	

The results of the analysis of the comparison of knowledge show that the mean in the experimental group (2,95) is higher than in the control group (1,25), with p_{value} of 0,010 (<0.05). The f skill level in the experience group (24,5) is also higher than in the control group (16,5), with a p_{value} of 0,023 (<0.05). These results indicate that the intervention given to the experimental group is significantly effective in increasing the respondents' knowledge and skills in providing evacuation to patients with suspected spinal cord injuries (Table 3).

DISCUSSION

Based on gender characteristics, it was found that the majority of research was conducted by female respondents. These results are in line with research conducted by Ayu et al., (2019) that explained differences in motivation for participating in an activity. This occurs because female students have greater motivation or desire than male students because there are differences in behavior between women and men. Female students tend to spend more time on structured activities, while male students spend more time outdoors for unstructured activities.

The distribution of respondents' age characteristics shows that in both the intervention and control groups, the majority of respondents were 16 years old. The results of this research show that all respondents are in the middle adolescent age category. Adolescence is a transition period from childhood to adulthood that is marked by psychological and biological growth and development (Hidayati, 2016).

The teenage age categories, according to Fatmawaty (2017), are early adolescence (12–15 years), middle adolescence (15–18 years), and late adolescence (18–21 years). In research conducted by Maulida & Pranajaya (2018), during adolescence, there are brain changes so that they are able to think more critically and their thinking patterns improve, and this happens to high school students. The more mature a person's age in thinking will continue to influence a person's cognitive level, grasping power, and thought patterns (Widyaswara & Suwaryo, 2017).

Based on the length of participation of respondents, the data showed that the majority of respondents in the control group were members who took part in the Young Red Cross for 7 months, while in the intervention group, the majority were members who took part in the Young Red Cross for 19 months. The Young Red Cross members of Ngemplak 1 High School are active in participating in research activities so that it is easier to understand and practice evacuation for indications of spinal cord injury. This is proven by the results of the increase in knowledge and skills of the Young Red Cross

members after being given the intervention. These results are in line with Nofianti (2018), who stated that students who actively participate in school extracurricular activities can increase their knowledge, so indirectly, their learning achievement will also increase.

The results of this research are in line with the objectives of extracurricular activities in schools. According to Kemendikbud (2014), extracurricular activities are carried out to develop students' talents, potential, interests, cooperation, independence, abilities, and personalities to support the achievement of the goals of national education. With this goal, students can increase their enthusiasm for improving their learning achievement optimally so that it is in accordance with the goals of national education.

Based on the research results, the average value of knowledge in the control group before and after the implementation had increased; however, the increase experienced was not as large as the average increase in the intervention group. The demonstration method is a learning method that shows a particular process and situation and has advantages, including students being active in observing the learning process, being able to understand the material being presented, and the delivery being clear and concrete (Aulia et al., 2019). In line with research conducted by Robani (2020), the average knowledge value obtained before and after the demonstration was increased; however, the increase in knowledge obtained was lower than the average value in the intervention group.

The average knowledge results in the intervention group before and after the majority of the intervention increased. According to Notoatmodjo (2014), the learning process is a change in abilities experienced by someone who wants to learn and is influenced by appropriate learning methods, tools, and techniques. Knowledge can arise due to the influence of the senses of sight and hearing through the media or methods used in the process of conveying information, which can have an influence on increasing knowledge. Knowledge is the result of curiosity about a particular object through sensory processes in the senses of sight and hearing.

The role-play method can support learning with cognitive, affective, and skill objectives. Increased knowledge can be seen from the pre-test and post-test scores (Suharini & Baharsyah, 2020). Research conducted by Tauhid et al., (2021) shows that before and after being given intervention, the average student ability score increased to 27.3%. The results of the average knowledge scores in both groups prove that there is an increase in knowledge among the Young Red Cross members of Ngemplak 1 High School before and after being given intervention in the form of role-play and demonstration methods. However, a higher increase occurred in the intervention group that had been given the role-play method; namely, there were 19 respondents who had good knowledge.

Before and after the intervention, there was also an increase in the average skill score in the control group. Demonstration is a method that uses teaching aids that aim to facilitate the learning process, and each student uses all the senses to receive the material that has been presented, so this method can improve students' skills. The results of research conducted by Rachmawati (2021), show that the group that was given the demonstration experienced an average increase in skill scores. The intervention group also experienced an increase in the average skill score.

According to Kundre & Mulyadi (2018), skills are a person's ability to apply theoretical knowledge in certain situations and do it well. Role play can encourage students to reflect on the knowledge they have so that it has an effect on improving

students' skills (Gamanik et al., 2019). In line with research conducted by Saputra et al., (2019) the results showed that all respondents in the treatment group at the pre-test were not yet able to take action to treat wounds, but after being given the role-play method, the post-test results showed that the majority of children were able to handle open wounds namely, 17 children (68%).

Another study conducted by J et al., (2020) showed that the total skill score before being given the role-play method was 38.66 and increased to 90.54 after being given the role-play method. The results of the average skill scores in both groups prove that there has been an increase in skills among the Young Red Cross members of Ngemplak 1 High School before and after being given intervention in the form of role-play and demonstration methods. However, a higher increase occurred in the intervention group that had been given the role-play method, where there were 18 respondents who had good skills.

In this study, the paired difference test on the control group's knowledge variable used the Wilcoxon test. The results of the Wilcoxon test show that there is a significant difference between knowledge before and after being given the demonstration. In line with research conducted by Prasetyawan and Fitri (2019), using the paired difference test, it was found that the demonstration method was effective in increasing students' knowledge of providing first aid.

The results of the paired difference test in this study used the dependent t-test on the intervention group's knowledge variable, namely that there was a significant difference between knowledge before and after being given the role play. In line with research conducted by Tauhid et al., (2021) the research results show that the role-play method has an effect on students' ability to provide first aid in earthquake disasters. The results of the research analysis conducted by J et al., (2020) show that there is a significant difference between respondents' knowledge before and after being given the role-play method.

The unpaired difference test in these two groups used the independent t-test with results of $0.01 < 0.05$, which means that role play is effective in increasing knowledge of carrying out evacuations for indications of spinal injuries. Even though both methods are equally effective in increasing knowledge, judging from the mean value, the mean value of role-play is higher than that of demonstration, namely 2.95 compared to 1.25. In line with research conducted by Aghababaeian et al., (2013) the results of the role-playing method showed a significant difference in the knowledge of the medical staff.

In line with research conducted by Suharini & Baharsyah (2020), the role-playing method using a disaster education pocketbook as a medium is more effective than the control group. Research conducted by Khoiro et al., (2021) also concluded that there are differences between role-playing and demonstration learning methods in the learning outcomes of class V students at MI Al-Hidayah Sidoarjo. A learning process is said to be successful if the selection of methods and media is carried out appropriately and effectively (Robani, 2020).

Using appropriate methods and media can improve students' competencies and skills in accordance with the targets to be achieved. The method is that learning method must attract students' attention so that an active, conducive, and enjoyable learning atmosphere is created so that students can develop their abilities (Negara, 2021). The results of other research conducted by Sukanto and Rifqia (2019), can conclude that role play is effective in increasing knowledge.

In this study, both interventions had an effect on increasing knowledge of evacuation for indications of spinal cord injury; however, the mean score for role play was higher than demonstration. The efforts made by researchers using the role-play method are because role-plays are considered more effective than demonstrations. The role-play method is a method whose implementation is able to present the role of an event in daily life that is brought out deliberately in a particular activity (Rahmawati & Puspasari, 2020).

The advantages of role play include students being able to think creatively and actively, being able to identify a particular situation, and giving students the opportunity to connect theory and practice through role-playing (Bahtiar & Suryarini 2019). The role-play method involves students taking part in role-playing so that it can increase collaboration between students and make learning effective. By implementing role-playing learning, students can increase their knowledge, so it is hoped that the Young Red Cross members will be able to know the correct first aid techniques for evacuating indications of spinal cord injury.

In this study, the paired difference test on the control group skill variable used the Wilcoxon test. The result is that H_a is accepted, which means there is a significant difference between skills before and after being given a demonstration. Research conducted by Rachmawati (2021), used the dependent t-test, namely that there was a significant difference in the skills of SMK 3 Blitar students before and after being given the demonstration method. The results of this research's pairwise difference test using the Wilcoxon test on the skill variable of the intervention group showed that there was a significant difference between skills before and after being given role play.

In line with research conducted by Saputra et al., (2019) using the Wilcoxon sign rank test, it can be concluded that there is a significant difference in skill actions before and after being given the role-play method. The results of the research analysis conducted by J et al., (2020) with the results of the research conducted, namely that there was a significant difference between the respondents' skills before and after being given the role-play method. In line with research conducted by Alimohammadi et al., (2017) research results show that there are differences in students' skills in carrying out basic life support using the role-play method.

The unpaired difference test in these two groups used the Man Whitney test with results of $0.023 < 0.05$, which means H_a is accepted, so it can be concluded that role play is effective in improving skills in evacuating indications of spinal injuries. Even though both methods are equally effective in improving skills, judging from the mean value, the mean value of role-play is higher than demonstration (24.5 compared to 16.5). In line with research conducted by Saputra et al., (2019) with the results of the Mann-Whitney test, there were significant differences in actions between the treatment group and the control group.

In this study, both interventions had an effect on increasing evacuation skills for indications of spinal cord injury; however, the mean score for role play was higher than demonstration. The use of two different methods in conducting research can influence differences in improving respondents' skills (Aulia et al., 2019). The demonstration method has the advantage that students' attention is more focused and directed on the material being presented (Noftalina, 2020).

According to Prasetyawan & Fitri (2019), the weakness of the demonstration method is that the longer the learning process takes, the less attention the presenter will have, so students feel bored. An effective learning method for preventing boredom is

role play. This is in line with learning principles, which prioritize emotional and intellectual processes, so that learning situations must be created to be happy, informal, and enjoyable (Aulia et al., 2019). Increased skills are influenced by choosing the right learning method.

According to Dorri et al., (2019) role play is an effective educational method in triggering active learning because all students have the opportunity to be involved, so it can increase students' self-confidence and make them think more creatively. Role play is an active learning method that can store skills in long-term memory. The role-play method has a positive impact, especially in increasing skill aspects. In line with research conducted by Delnavaz et al., (2018) the results show that the role-play method is effective in increasing the value of skills in carrying out triage.

The role-play method not only provides students with the opportunity to improve clinical skills but can also improve communication skills. Role play can improve students' communication skills because it aims to discuss and realize the competencies they have (Ahmady et al., 2021). According to Heidarzadeh et al., (2020) the role-play method can raise a student's motivation and satisfaction in the learning process. The advantages of this method include a combination of theory and practice, minimal facilities, and lower costs compared to other simulation methods.

The role-play method is very appropriate to apply to learning in the domains of attitudes and skills. Therefore, this method is suitable for learning because it can improve students' knowledge, attitudes, and skills widely. In line with what was stated by Souza et al., (2021) in the learning process, students will study three learning domains, including cognitive, which consists of intellectual development, knowledge, attitudes, and skills. Next, psychomotor is related to specific physical and affective abilities, which consist of emotional development including attitudes, behavior, responsibility, emotions, and respect. Moreover, emergency training can also increase the self-confidence of the community in accessing medical emergency services (Sunarto & Harnanto, 2021).

Research conducted by Vizeshfa (2016), shows that role-playing is a learning method that prioritizes collaboration so that it can improve student learning. The role-play method of learning can be used as a separate learning method or as a complementary method. This method has been accepted in academic education, which aims to prepare students to face a professional environment. This is in line with what was stated by Valizadeh et al., (2020).

The role-play method provides a great opportunity for students to develop their abilities in a safe and free environment and prepares them to prepare themselves for actual clinical practice. Role-play learning is a holistic form of learning that fosters critical thinking processes, moral values, and factual information. The approach used is the role-play method, namely, where interpersonal interactions are observed, analyzed, and evaluated by other people (Kiran & Stirling, 2020).

According to Ahmady et al., (2021) role play is a learning method that allows students to play roles in situations that are close to reality. The role-play method can guide students in understanding social behavior so that they can develop empathy in social environments. Therefore, by implementing role-play learning, it is hoped that it can improve students' skills so that the Young Red Cross members can carry out first aid techniques for evacuating indications of spinal cord injury correctly and quickly.

CONCLUSION

The results of this study prove that the roleplay method is an effective method of choice for increasing knowledge and evacuation skills in patients with indications of spinal cord injury. However, in carrying out this research, there are still limitations, such as data collection, which was only carried out once. The level of knowledge and skills is something that must be continuously updated and evaluated regularly because there are many factors that influence its permanence. Therefore, in future research, it is hoped that periodic evaluations of the level of knowledge and skills can be carried out.

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