

# EFFECT OF INSTRUCTIONAL VIDEO OF SPLINTING PROCEDURE TO NURSING STUDENTS SPLINTING SKILL (PREHOSPITAL SETTING)

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## **INTRODUCTION**

Musculoskeletal injuries (MSI) is one kind of injury that is often experienced by people who have an accident (Chalya *et al.* 2012). Fracture is one of the symptom caused by some types of accidents such as traffic accidents (45.3%), falls (42.6%), workplace accidents (8.9%), sport accidents (2.2%), or as a result of gun shots (0.89%). The effect of musculoskeletal injuries is the emergence of extreme pain, mobilizing problem, and severe bleeding that may also occur depending on the location and type of the fracture (Vyas *et al.* 2014). Research conducted by Mishra and Mishra (2015) showed that in 30% of patients who had an accident, 18% had a single fracture, while some patients had multiple fractures. The complications due to fractures can be a serious problem such as malunion, nonunion, pain, loss of function, muscle atrophy, cartilage degeneration, stiff / swollen joint, deep vein thrombosis (DVT), pulmonary embolism (PE), and died due to massive bleeding (Mehta *et al.* 2014).

Prehospital care and transportation for patients who had fracture must done immediately in order to prevent the injured bone getting worse and can reduce the extreme pain which emerged as a result of fracture (El-Dakhkhny, 2010). Splinting is one of the procedure that is given with the purpose to give an immobilization in a patient (Irajpour *et al.* 2012). As a simple technique, splinting procedure is very easy to do as an effective option that highly effective in the treatment of patient with fracture on the emergency situation (Alton *et al.* 2014). Splinting procedure is quite simple, but it require a form of understanding and set of skills to do correctly. Nursing students have a very important role in assisting the process of handling victims who is suffering from fracture. They also need to have a special skill in doing a splinting procedure. An innovative teaching method using technology is very important for nursing student to master the splinting procedure effectively (Parasuram *et al.* 2014).

One of the strategies of innovative learning model based on modern technology is an audio-visual instructional video that gives a real application concept of nursing procedure or other nursing

experience in a video form (Jenson & Forsyth, 2012). The use of this model will provide an understanding of the concept for nursing students independently to gain the knowledge and also the set of skills (Cant & Cooper, 2010). Smith and Hamilton (2015) in their research on the effects of instructional video as one of strategies of learning in nursing student showed that the model of learning with instructional video provided convenience for nursing students to enhance clinical skills for the basic competencies in nursing.

The purpose of this study is to determine the effect of instructional video of splinting procedure to nursing students splinting skill.

## **METHOD**

### **Study Design**

A quasi-experimental study with a pretest and post-test design was used in this study. The study was carried out between the 18<sup>th</sup> July to 7<sup>th</sup> of August, 2016.

### **Participants**

All of the second level nursing students in Nursing Diploma III Program, University of Bondowoso, age 20-21 years, were asked to be participants in this study. Sampling technique that used in this study was a purposive sampling. 54 students who were asked to be participants, as many as four students were not willing the study because of health problem, the other ten were not willing because of their personal reason. A total of 40 participants (n=40) were divided into two groups: experimental and control groups, where each group consisted of 20 participants.

### **Location**

The place chosen for this study was Nursing Diploma III Program, University of Bondowoso.

### **Tool**

The tool required in this research was an instructional video of splinting procedures. Splinting equipments also required to do the procedure of splinting. All of the procedure mostly done in nursing laboratory.

### **Data Collection**

Data collection tool used in this study was the form of manual procedure checklist of splinting. This

checklist based on the guidelines that was given by Patel, Roth, & Kapil (2011).

**Procedure**

This study consisted of three phases, there were learning skills phase, intervention phase, and the evaluation skills phase. In learning skills phase, researcher gave a demonstration of splinting procedure in accordance with the manual procedure to the experimental and control group for 60 minutes. The next phase was the intervention phase that was given to the experimental group only. The experimental group was given an instructional video of splinting procedure after the demonstration and being taught that the video could be a guide for experimental group. The experimental group was given the opportunity to be able to do independent learning with the instructional for one week at least three times viewed. The control group in this study was only given a demonstration. The next phase is the evaluation phase in which conducted one week after the intervention phase. This phase filled with post-test from both study groups and then the result analyzed by researcher.

**Ethical Consideration**

Written permission was received from Nursing Diploma III Program, University of Bondowoso. Individual informed consent was obtained from each participant to ensure anonymity. A written summary of the study was given to those willing to participate in this study.

**Data Analysis**

The data was analyzed using SPSS, version 20.0 (IBM Corporation, Armonk, NY). Descriptive statistics were utilized to evaluate the general characteristics of the participants. The homogeneity test was used. The normality test was used Kolmogorov-Smirnov<sup>a</sup>. The data were given as the mean and standard deviations. A t-test was used to assess between-group differences. Two-tailed *p*-values < 0.05 were considered significant.

**RESULT**

**General Characteristics of Participants**

The general characteristics of respondents in gender and age were showed in table 1.

**Table 1. General Characteristics of Participants**

Characteristics	Experiment (n=20)	Control (n=20)
<b>Gender</b>	Male	9 (45)
	Female	11 (55)
<b>Age</b>	M	20.25
	SD	0.444
	Range	20-21

Note: M = mean; SD = standard deviation

**Test of Homogeneity**

The result of the homogeneity test on the pre-test point of the experimental and control group showed that both groups were homogeneous. *p* value was 0.751 and its greater than 0.05 as their points of splinting procedure had no statistically significant difference. The data showed in table 2.

**Table 2. Test of Homogeneity**

Variables	Experiment M (SD)	Control M (SD)	T	P
<b>Splinting Procedure (Pretest)</b>	37.50 (11.642)	39.00 (14.832)	-0.356	0.751

Note: M = mean; SD = standard deviation

**Test of Normality**

The result of the normality test on the pretest and post-test points of the experimental and control groups showed that both data in groups were normal. The result of pretest and posttest in both groups obtained significant value (Kolmogorov-Smirnov<sup>a</sup>) greater than 0.05, so it can be concluded that the data were normal.

**Table 3. Test of Normality**

Variables	M (SD)	Skewness	Kurtosis	Kolmogorov-Smirnov <sup>a</sup>
<b>Pretest Control Group</b>	37.50 (11.642)	0.097	-0.869	0.056
<b>Pretest Experiment Group</b>	39.00 (14.832)	0.189	-0.737	0.128
<b>Post-test Control Group</b>	62.00 (22.384)	-0.184	-1.141	0.058
<b>Post-test Experiment Group</b>	83.50 (13.089)	-0.731	0.646	0.056

Note: M = mean; SD = standard deviation

**Comparison Between Groups**

**Table 4. Comparison between groups**

Variables	Groups	Pretest	Posttest	<i>p</i>
		M (SD)	M (SD)	
Splinting Procedure Skill	Experiment	39.00 (14.832)	83.50 (13.089)	0.00
	Control	37.50 (11.642)	62.00 (22.384)	0.00

Note: M = mean; SD = standard deviation

The result of both groups were presented in Table 4. There was a change in the experimental group before being given a treatment and after being given a treatment. The result of dependent *t* test in the experimental group was *p* = 0.000. *p* value was lower than 0.05 and it could be concluded

that there was a significant difference in the experimental group before and after being given a treatment. On the other hand, the result of dependent *t* test in the control group was  $p = 0.000$ .  $p$  value also lower than 0.05 and it could be concluded that there was a significant difference in the control group before and after being given a demonstration only.

#### Effect of Instructional Video of Splinting Procedure

Data that was presented in table 5, showed that the difference between the experimental group and the control group which was analyzed using independent *t* test got the  $p$  value = 0.001.  $p$  value < 0.05 so it could be concluded that there were a significant difference between the experimental group and the control group after the treatment was given in the form of instructional video of splinting procedure in the experimental group.

**Table 5. Effect of Instructional Video of Splinting Procedure**

Variables		Exp (n=20)	Control (n=20)	<i>p</i>
		M (SD)	M (SD)	
Splinting Procedur e Skill	Pre	39.00 (14.832)	37.50 (11.642)	0.001
	Post	83.50 (13.089)	62.00 (22.384)	
	Differen ce	44.50 (22.118)	24.50 (23.503)	

Note: M = mean; SD = standard deviation

#### DISCUSSION

Participants in this study, not all of them could complete the splinting procedure perfectly. Although they could not complete the procedure completely, there was a difference between experimental group and control group in the score of post-test. Table 6 showed that there was a difference in the value of post-test between the experimental group and the control group which was gotten a range for 21.50 points. The experimental group had a greater post-test value than the control group. Data analyzed using independent *t* test and the result was  $p$  value = 0.001.  $p$  value < 0.05 so it could be concluded that there were a significant difference between the experimental group and the control group after the instructional video was given. It could be taken a decision that there was an effect of instructional video of splinting procedure to nursing student's splinting skill.

The development of the modern world, accompanied by the growing of sophisticated technology have changed various educational settings including the selection of learning model to nursing students (Gandhi *et al.* 2015). The good

quality of learning model will provide the opportunity for nursing students to be able to evolve more knowledge and skills for the establishment of professional nurse (Kim, 2013). Instructional video is one of the strategies of innovative technology-based learning model that can provide a real action of nursing procedure or other nursing experience in a form of audio-visual media (Jenson & Forsyth, 2012).

Jenson and Forsyth (2012) in their research was conducted to test the effectiveness of instructional videos on installation procedure of IV catheter. Mostly participants stated that instructional videos can help in understanding the procedure more easily, so it helps in improving the skills and self-assurance in initiating doing the IV catheter procedure. Synder *et al.* (2010) in the result of his research explained that the learning model by using instructional video and other media based on advanced technology could assist the retention of clinical skill of nursing students. Retention of clinical skill in those participants were retained for at least 4 months whether preparation is independent or proctored.

Smith and Hamilton (2015) in their research on the effect of three-dimensional instructional video as one of the learning strategies in nursing students in improving catheter skills procedure, showed that the learning model that was given to nursing students provided convenience to enhance catheter skills procedure. In that study, the experimental group got a better score than the control group. Participants in the experimental group invited to have an access to instructional videos of catheter procedure to be studied while the control group was given the opportunity to follow the demonstration only. Evaluations conducted by researchers after obtained the result of post-test which showed positive trends for increasing the level of skill in completing catheter procedure.

The use of instructional video from a nursing procedure will provide an easy way to understand the and also can be easily learned independently by nursing students to gain knowledge and skills (Cant & Cooper, 2010). Hashees *et al.* (2011) in their study also explained that the modern learning model such as instructional video is more effective than the traditional learning model in building the capability of students as a critical thinker and problem solver. Instructional video is an instructional strategy that can present a simulation similar to the actual application and will be able to easily captured and analyzed by nursing students in the learning process (Kilmon *et al.* 2010).

The advantage that is gained by instructional video as a learning model for nursing students are independent and practical (time effective and cost effective). Instructional video that used by nursing

students in supporting the learning process can be carried out independently by nursing students anywhere and anytime when the technologies are enabling to support the learning process (Tschannen *et al.* 2011). Edbert *et al.* (2013) also added that a nursing student can review the nursing procedure with a direct instructional video that can be stored in media technologies such as PC, laptop, or mobile phone that can be accessed anytime and anywhere. Instructional video is also very effective in terms of time for educators and nursing students to direct the activity of the student in learning independently conduct by not limited to a specific time (Gandhi *et al.* 2015).

The second advantage is to provide an effective learning process. Jenson and Forsyth (2012) in their study showed that an instructional video could provide an effective learning process in improving the skills of nursing students. Synder *et al.* (2010) also explained that the learning outcomes using instructional video could provide a retention in understanding of nursing student for doing a nursing procedure that could last longer. It all because the process of understanding is easy and can be repeated at various time. Instructional video also provide a reflection that can be easily learned by nursing students independently to obtain an effective understanding and it could be an effective way to enhance the set of competencies for nursing students (Cant & Cooper, 2010).

#### LIMITATION

There are several limitations of this study. The small sample size and the withdrawal of participants from the course and study can affect the finding statistical significance between the experimental and control groups. Another limitation is that practice times using the instructional video of splinting procedure was only reported by the participants, researcher did not observe it directly to the participants. So that researchers can not confirm how long the time needed by nursing students in enhancing the splinting procedure skills by using instructional video.

#### RECOMMENDATION

Further research is needed to observe how long it takes for a nursing student studying a nursing procedure using an instructional videos in the side of accuracy of the time. Qualitative research is also highly advisable to know about the students experience in using instructional video as one of learning model in nursing.

#### CONCLUSION

The growing of technology gives an opportunity to the nursing education to be able to develop a

variety of learning model based on modern technology that can help nursing students to improve the skills of nursing. The result of this study shows that the instructional video of splinting procedure has a significant influence on the improvement of skills of nursing students in doing splinting procedure. Instructional video also provides several benefits to nursing students including helping to learn practically, independently, and effectively without limited by place and time as long as technology that supports the learning process is available.

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