Original Research

Differences in Clinical Simulation with Audio-visual and Practicum-based Standard Operating Procedures in Nursing Student Competencies

Hendri Palupi[1], Kusnanto Kusnanto[2] and Slamet Riyadi Yuwono[3]

Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: The biggest challenge in nursing education is to produce nurses who are professional and competent. Effective and efficient learning through appropriate methods and media is very important. Practical learning based on standard operating procedures (SOP) has been widely applied, but clinical simulation approaches with audio-visual media have not been scientifically proven. The purpose of this study is to compare student competencies through clinical simulation learning with audio-visual media and practicums based on SOP.

Methods: This was a quasi-experimental study with a pretest-posttest control group design. The sample consisted of 40 students recruited using simple random sampling and then divided into 2 groups: 20 respondents were given clinical simulation methods using audio-visual materials and 20 respondents were given practicum based on SOP. The independent variables were clinical simulation with audio-visual media and practicum based on standard operating procedures. The dependent variable was student competency, assessed using competency assessment including cognitive, affective, and psychomotor methods. Data analysis was conducted using the Wilcoxon test.

Results: The use of clinical simulations with audio-visual media and practicum based on SOP can increase the value of competency in nursing students, but the median value on the use of clinical simulations using audio-visual sources is higher than practicum based on SOP.

Conclusion: Clinical simulations with audio-visual media can be recommended as effective learning methods and media for nursing students.

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INTRODUCTION

Nowadays, health problems are increasingly complex and demands for health services are also increasing. Nursing education must prepare competent graduates to be able to compete both nationally and globally. National nursing competency test graduation rates increased, but not significantly, in 2015 by 38%, and in 2016 by 51%. In East Java Province it increased from June 2014 (45.8%), November 2014 (68.2%), September 2015 (82.6%), but in 2016 it decreased to 51.6%. Based on a preliminary study conducted at one of the high school health sciences in Nganjuk District, it was found that the passing level of nurses' competency tests had not yet reached maximum results. Only 17 of 63 students

passed the competency test in June 2015 (26.9%), and in 2016 out of 2 competency tests students passed 32 of 98 students in April 2016 (32.6%), and 21 out of 78 students (26.9%).

One of the efforts to increase the level of graduation of students in the national competency test is through a learning process that is supported by various learning components to achieve the desired goals. The use of audio-visual media is one form of intervention that can be given in addition to conventional methods. Audio-visual media provides stimulation to hearing and vision, so that the results obtained are more optimal (Maulana, 2009). Another strategy that can be used to optimize learning outcomes is through clinical simulation methods. The use of simulation as an educational technique has

been widely adapted in the health field, both for evaluation of training and nurse performance. Initial uses of simulation include teaching psychomotor skills and competency tests (Larew C, Lessans S, Spunt D, Foster D, 2006).

Simulation plays an important role in clinical education and evaluating the competencies of graduates of nursing students. Clinical simulations were developed to provide opportunities for students to identify patients in general, think critically, and be able to show appropriate interventions (Levett-Jones & Lapkin, 2014). The application of clinical simulation with audio-visual materials is expected to be able to make students practice as in real situations so as to achieve the expected competence. The purpose of this study was to determine the effectiveness of clinical simulations using audio-visual media compare to practicums based on SOP toward nursing student competencies.

MATERIALS AND METHODS

This study used a quasi-experimental with a pretest-posttest control group design. The population of this study were all students in one of the health sciences at a high school in Nganjuk district who were in the 6th semester and who had completed the neuro-behavioural system course. The research sample consisted of 40 nursing students recruited using simple random sampling. The samples were divided into 2 groups: 20 students who were given clinical simulations with audio-visual sources and 20 students who were given practicum based on SOP. The independent variables were clinical simulation with audio-visual media and practicum based on SOP. The dependent variable was student competence. Data collection tools used observation sheets and competency assessment sheets (cognitive, affective, and psychomotor).

The intervention for treatment group given by using simulation modules and audio-visual media (15 – 20 minutes) was conducted 8 times. While the control group were given case scenarios and standard operating procedures for 100 minutes held 4 times. All of the respondents were tested for competencies before and after intervention.

Data were analysed using the Wilcoxon test to determine differences in competency values (cognitive, affective, and psychomotor) in the clinical simulation with the audio-visual group and practicum based on SOP groups with a significance level of 95%.

The study has obtained an ethics approval certificate from the Health Research Ethics Commission of the Faculty of Nursing, Universitas Airlangga Surabaya, with the certificate number 528-KEPK in 2017.

RESULTS

The characteristics of respondents from both groups are shown in Table 1. In both groups, 40 respondents (100%) were aged ≤ 25 years and had previous practical experience and most of the 24 respondents (60%) were female.

Table 2 shows that cognitive, affective, and psychomotor abilities in the clinical simulation group with audio-visual media have a higher median value than the practicum group based on SOP. Wilcoxon test results measuring the differences in competence obtained p value 0,000 (<0.05) in the clinical simulation group with audio-visual media and p value 0.001 (<0.05) in the practicum group based on SOP. In both groups, both used clinical simulations with audio-visual media and practicum-based SOP have an influence on the competence of nursing students despite the difference in median values.

DISCUSSION

The results of data analysis proves that the clinical simulation method with audio-visual media can improve nursing student competencies. These competencies include cognitive, affective, and psychomotor abilities. The selection and use of media and method is one important component in supporting the implementation of learning. Problem-based learning is one of the learning methods that stimulates students to learn independently so as to enable students to practice with real situations (Castro-Sánchez et al., 2012).

Research conducted by (Bloch & Bloch, 2013) proved that 220 emergency room nurses received written instructions and 216 with video contained significant knowledge. Instructions that use video can increase the emergency room nurse's knowledge in 2 to 5 days quicker rather than written instructions. The satisfaction of the ER nurse is also greater than in writing. In line with (Armstrong et al., 2010) audio-visual media can present informed consent and wound care instructions more effectively and produce higher satisfaction than verbally. (Lin, Khaira, & Khairuzzaman, 2014) also proved that multimedia-based health education is not only limited to information providers but can increase the motivation, skills, and self-efficacy needed in taking actions related to improving health. Rosen et al (2010) also proves that Entertainment Education (EE) through audio-visual media aims to deliver health education messages in an interesting and entertaining way. The study of hand washing through audio-visual media contributes to changing unhealthy behaviours into healthy ones. The media is able to stimulate or enter information through sensory sharing. The more stimulation, the easier the information is to accept. Audio-visual media provide stimulation through the eyes and ears. The combination of information channels through the eye reaches 75% and the ear 13%, will provide stimulation that is good enough so that it can provide optimal results (Maulana, 2009).

The use of appropriate methods in one presentation of material is very important in order to achieve the desired goals. (Levett-Jones & Lapkin, 2014) define simulation as a technique used to

Table 1 Characteristics of Respondents in Clinical Simulation Groups with Audio-visual and Practicum Groups based on Standard Operating Procedures

Characteristics	Clinical Simulation Groups with Audio-visual Media		Practicum Groups based on Standard Operating Procedures		Total	%
	n	%	n	%		
Age (year)						
a. <25	20	100	20	100	40	100
b. ≥ 25	0	0	0	0	0	0
Gender						
a. Male	7	35	9	45	16	40
b. Female	13	65	11	55	24	60
Practicum Experiences						
a. Don't Have Experiences	0	0	0	0	0	0
b. Have Experiences	20	100	20	100	40	100

Table 2 Obtaining Competency, Cognitive, Affective, and Psychomotor Scores According to Pre-test and Post-test in the Clinical Simulation Group with Audio-visual and Practicum Groups based on Standard Operating Procedures

Group	Variable		Med ±Min-Max	ρ value
Practicum Group based on Standard Operating Procedures (n=20)	Cognitive	Pre test	7,50±5-10	0,002
		Post test	8,00±5-12	
	Affective	Pre test	46,50±42-63	0,004
		Post test	47,50±42-63	
	Psychomotor	Pre test	42,50±29-52	0,001
		Post test	43,50±28-56	
	Competency	Pre test	97,00±84-108	0,001
		Post test	99,50±84-115	
Clinical Simulation Groups with Audio-visual Media l (n=20)	Cognitive	Pre test	7,00±3-10	0,000
		Post test	9,00±5-13	
	Affective	Pre test	48,00±42-63	0,000
		Post test	55,50±42-67	
	Psychomotor	Pre test	47,00±29-63	0,000
		Post test	59,00±28-71	
	Competency	Pre test	103,00±84-120	0,000
		Post test	120,50±84-145	

replace or strengthen real experiences guided by experiences that evoke or replace substantial aspects of the real world in a fully interactive way. (Woodworth, Chen, Horn, & Aziz, 2014) compared respondents that were given video exposure and video-based simulations. The results showed that there was a significant increase in knowledge related to USG anatomy and skills, but in the two groups there was no significant improvement in procedures. The results of the study show that instructional videos and simulations can be effective tools to explicitly increase knowledge. Computer-based simulations combined with several types of procedural training can improve technical skills (McGaghie, Issenberg, Cohen, Barsuk, & Wayne, 2011). (Lippe & Becker, 2015) assessed the learning process of simulation in providing care to critically ill patients. The results of statistical tests show that the attitude and competency scores of students have significantly increased. Therefore, it can be concluded that clinical simulations offer strong teaching strategies to improve students' attitudes and competencies in treating comatose patients. Other studies conducted by (Przybyl, Androwich, & Evans, 2015) showed the use of simulations proved effective in increasing nurse satisfaction, understanding of the principles of CRRT (Continuous Renal Replacement Therapy), and critical thinking skills with CRRT operations, scores increased from pre-simulation to questionnaire post simulation. (Blake, 2014) also reinforces that instructional-based simulations equip medical students with knowledge, skills, attitudes, and behaviours towards clinical conditions in various situations. (Dalton, Head, & Levett-Jones Rn, 2015) Simulation scenarios create opportunities for students to apply and practice the knowledge gained from learning materials, and collaborative and supportive arrangements. Students will more easily understand cases through scenarios rather than theory in class so that they can reduce their failure rate when taking clinical action in the hospital.

The limitation of this study is that there is no specific clinical simulation space available that is designed as a visual environment that is visually, auditory, and kinaesthetic. Implementation of clinical simulations with audio-visual media can be continued and recommended for nursing students by providing facilities and competent instructors according to their expertise.

CONCLUSION

In both the clinical simulation group with audio-visual media and practicum groups based on standard operational procedures affect cognitive abilities, affective, and psychomotor, but the higher median values were obtained by the clinical simulation group with audio-visual media than practicum groups based on standard operating procedures. Clinical simulation methods with audio-visual media have proven to be effective on the competency abilities of nursing students.

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