Research Article

iMedPub Journals
www.imedpub.com

Journal of Medical Research & Health Education

2018
Vol. 2 No. 1:4

Analysis of Learning Effects in One-Day Simulation Based Workshop on Basic Airway Management and Mechanical Ventilation among Physiotherapy Students

Sivakumar VPR, Anandhi D, Monisha R*, Ganesh AS and Bhavani DE

SRM College of Physiotherapy, SRM University, Chennai, Tamil Nadu, India

***Corresponding author:**
Monisha R

Monishaphysio186@gmail.com

SRM College of Physiotherapy, SRM University, Chennai, Tamil Nadu, India.

Tel: +919940228679

Citation: Sivakumar VPR, Anandhi D, Monisha R, Ganesh AS, Bhavani DE (2018) Analysis of Learning Effects in One-Day Simulation Based Workshop on Basic Airway Management and Mechanical Ventilation among Physiotherapy Students. J Med Res Health Educ. Vol. 2 No. 1:4.

Abstract

Background: To analyze the effects of simulation-based learning experiences and to examine their potential to have a positive impact on physiotherapy (PT) learners' knowledge. Globally, physiotherapy students are required to complete 2410 hours of placement-based education to prepare them for immediate clinical practice on graduation. Numerous workshops are conducted by physiotherapists for 14 hours or more and there is no evidence to support the knowledge acquisition of students by these teaching hours.

Objective: To determine knowledge gain of physiotherapy students who participated in a standardized, one-day simulation based workshop organized in SRM College of Physiotherapy, SRM University.

Methods: The study population consisted of 30 students who participated from various colleges of Physiotherapy. A 20-question multiple-choice test and Feedback form which addresses 7 questions with 5 point rating scale was completed before and after the workshop. Pre and post-test analyses were performed.

Results: Scoring increased significantly from pretest to post-test for students from various Colleges of Physiotherapy.

Conclusion: This workshop had a positive impact on the knowledge gain of physiotherapy students on the topic of respiratory arrest, basic airway, oxygen therapy and mechanical ventilation using Simulation based education. This is an effective strategy for teaching physiotherapy in this region.

Keywords: Simulation based workshop; Basic airway; Respiratory arrest; Oxygen therapy; Mechanical ventilation

Received: Februaury 10, 2018; **Accepted:** Februaury 16, 2018; **Published:** Februaury 21, 2018

Introduction

Simulation is not a new teaching modality within the physiotherapy profession [1]. Clinical skill development which is experienced during practice on 'real' patients is deemed an essential component in the development of professional skills and has been used within physiotherapy educational examples since the inception of the profession in 1895 [2]. Simulation Based Education has been used for cardio-respiratory patient safety. The program aimed to utilize simulation training and scenario based learning to assist in teaching physiotherapy. The goal of the training program is therefore to improve patient safety and care overall [3]. This integrated simulation and technology is an enhanced learning framework. Simulation-Based Education (SBE) offers an important route to safer care for patients and needs to be more fully integrated into healthcare education, simulation also provides a safe environment for learning clinical communication, teamwork and clinical decision-making skills [4]. Simulation has the potential to improve not only the quality of health and social care but also to have an impact on patient outcomes, patient safety and experience [5].

Simulation based teaching will have the impact on students to learn faster, when compared with other methods and SBE can progressively increase the core cardio thoracic knowledge base and clinical skills of the physiotherapists required to work in Intensive Care and with more complex patients across a

broader range of clinical specialties [6]. The goal was to improve the knowledge and confidence of the physiotherapy students providing the care, utilizing their core clinical reasoning skills and a simulation-based practice approach to care [7]. A core benefit of the SBE programme was to recreate emergency situations that the therapist may encounter in the critical care setting. This facilitates an added element of knowledge acquisition by the physiotherapist and allows development of new strategies and advanced emergency skills [8].

Thus, the objective of this study was to assess knowledge gain of physiotherapy students who participated in the one-day workshop as a measure of short-term impact of this educational strategy [9]. Learning is measured as the sustained improvements in performance that are observed after a rest period following the end of practice [8].

This study provides a novel exploration of the use of simulation-based education in cardio-respiratory physiotherapy, and presents a new integrated simulation and technology enhanced learning framework.

Methodology

Study design

This is a quasi-experimental pre-test/post-test study that includes data from one day workshop on simulation based education on basic airway management and mechanical ventilation for physiotherapists conducted by SRM College of Physiotherapy, SRM University.

Sample size

30 participants were enrolled to the workshop.

Selection criteria

Inclusion criteria: The only inclusion criterion was under graduate and post graduate students from various colleges of Physiotherapy in Tamil Nadu.

Exclusion criteria: Participants enrolled late for the workshop and did not participate in the pre-test session or that left early, and thus did not complete the post-test were excluded.

Workshop intervention

This report focused on the impact of the workshop on knowledge gain among physiotherapy students, data from 30 participants were included in this study. Recruitment of participants was done by disseminate workshop information to various colleges in Tamil Nadu. Workshop was organized in simulation lab, SRM Medical College Hospital and Research center with equipments and accessories provided for all the participants during their practical session.

All speakers in the workshop have signed conflict of interest at the beginning of the workshop. All the participants signed an informed consent before the workshop accepting to participate in the study. The contents of the theoretical component of the workshop were based on American Heart Association guidelines-respiratory arrest, Egan respiratory care, ICU Paul Marino, Elizabeth dean. Four main topics were discussed in workshop: (1) Respiratory arrest; (2) Basic airway management; (3) Oxygen therapy; (4) Mechanical ventilation. Feedback form was collected from all the participants at the completion of the workshop.

The workshop included a two hours theoretical and six hours practical sessions. In the practical sessions, respiratory arrest scenario was practiced individually with mannequins **(Figure 1).** Participants were grouped in two groups, instructions and demonstration was done and students practiced hands on training by operating and selecting low flow and high flow oxygen therapy, basic airway management maneuvers **(Figure 2).** Following post-lunch session students operated mechanical ventilator parameters, settings and troubleshooting. Participants were evaluated before and after the workshop with a 20-questions multiple-choice test on basic airway management, oxygen therapy and mechanical ventilator depending on information provided in the theoretical and practical sessions. Feedback form was collected from all the participants at the completion of the workshop. Certificate of participation was provided to all the participants [10].

Results

The data collected from the questionnaire and feedback form were tabulated and analyzed using SPSS software version 17.

Discussion

On comparing the pre-test and post-test mean values of the questionnaire, it showed that there is a significant knowledge gain of the participants, prior to and on completion of the workshop. **Table 1** shows that the mean pre-test value of 6.20 has statistically increased to mean post-test value of 13.43 (p=0.00) Frequency analysis calculated in the 7 point feedback questionnaire shows that for question one “I learned a new technique/idea” 58.6% (17 participants) have selected strongly agree (5.00) out of total 29 participants. 37.9% (11) have selected agree (4) and the remaining 3.4% (1 participant) have opted neutral (3) in the analysis. For the feedback question two “I am likely to use what I learnt in my practice” 48.3% (14 participants) have selected strongly agree (5.00 48.3% (14) have selected agree (4) and the remaining 3.4% (1 participant) have opted neutral (3) in the analysis. For the feedback question three “the instructor was helpful and effective” 58.6% (17 participants) have selected strongly agree (5.00) 41.4% (12) have selected agree (4) For the feedback question four “the instructor answered all my questions” 41.4% (12 participants) have selected strongly agree (5.00) 58.6% (17) have selected agree (4) For the feedback question five “the instructor was professional and courteous” 51.7% (15 participants) have selected strongly agree (5.00) in total of 29 participants,. 44.8% (13) have selected agree (4) and

Table 1 Comparison of pre and post-test values of the questionnaire.

		Mean	N	Std. Deviation	t	df	Sig. (2-tailed)
Pair 1	PRE-TEST	6.2000	30	2.00688			
	POST-TEST	13.4333	30	1.75545	-13.966	29	0.000

Table 2 Frequency table-feedback form.

S No	Feedback question	Valid		Frequency	Percent	Valid Percent	Cumulative Percent
1	I learned a new technique/idea		3.00	1	3.4	3.4	3.4
			4.00	11	37.9	37.9	41.4
			5.00	17	58.6	58.6	100.0
			Total	29	100.0	100.0	
2	I am likely to use what I learnt in my practice		3.00	1	3.4	3.4	3.4
			4.00	14	48.3	48.3	51.7
			5.00	14	48.3	48.3	100.0
			Total	29	100.0	100.0	
3	The instructor was helpful and effective		4.00	12	41.4	41.4	41.4
			5.00	17	58.6	58.6	100.0
			Total	29	100.0	100.0	
4	The instructor answered all my questions		4.00	17	58.6	58.6	58.6
			5.00	12	41.4	41.4	100.0
			Total	29	100.0	100.0	
5	The instructor was professional and courteous	3.00		1	3.4	3.4	3.4
		4.00		13	44.8	44.8	48.3
		5.00		15	51.7	51.7	100.0
		Total		29	100.0	100.0	
6	The course content was presented clearly and power point slides were good	3.00		3	10.3	10.3	10.3
		4.00		9	31.0	31.0	41.4
		5.00		17	58.6	58.6	100.0
		Total		29	100.0	100.0	
7	I practiced the technique well	4.00		10	34.5	34.5	34.5
		5.00		19	65.5	65.5	100.0
		Total		29	100.0	100.0	

Figure 1 Respiratory arrest scenario.

Figure 2 Basic airway management.

the remaining 3.4% (1 participant) have opted neutral (3) in the analysis. For the feedback question six "the course content was presented clearly and power point slides were good" 58.6% (17 participants) have selected strongly agree (5.00) 31.0% (9) have selected agree (4) and the remaining 10.3% (3 participant) have opted neutral (3) in the analysis. For the feedback question seven "I practiced the technique well" 65.5% (19 participants) have selected strongly agree (5.00) 34.5% (10) have selected agree (4) in the analysis **(Table 2).** This has been proved that majority of the participants chosen strongly agree and agree to various aspects of the workshop attended. Arciniegas et al. conducted a study on one-day workshop-based training improves physical activity prescription knowledge in Latin American physicians: a pre-test posttest study and concluded that this one-day workshop had a positive impact on the knowledge gain of MD's on the topic of PA prescription. Although all groups of specialties increased knowledge, GPs and family medicine MDs benefited the most. This short course is an effective continuing education strategy for teaching PA assessment, counseling and prescription to MDs in Latin America, a topic rarely included in the training of MD's in the region and the world. Further follow-up is needed to ascertain impact on PA counseling practices.

Conclusion

This one-day workshop had a positive impact on the knowledge gain of participating physiotherapy students on the topic of simulation based workshop on basic airway management and mechanical ventilation for physiotherapists. All the participants showed increased knowledge gain and they benefitted the most. Hence, future workshops should focus on developing and

implementing different strategies in order to address specific sub-groups of physiotherapy students this short course can be an effective continuing education strategy for teaching simulation based physiotherapy education. The short and long-term impact that a one-day workshop may have in the physiotherapist clinical practice should be evaluated in the future.

References

1 Zendejas B, Wang AT, Brydges R, Hamstra SJ, Cook DA (2013) Cost: The missing outcome in simulation-based medical education research: A systematic review. Surgery 153: 160-176.

2 Murray J (2016) Using video-reflexive ethnography and simulation-based education to explore patient management and error recognition by pre-registration physiotherapists. Biomed Advances in Simulation 1: 9.

3 Gough S, Nestel D (2017) Designing simulation-based learning activities: A systematic approach. In: Healthcare Simulation Education Evidence: Theory and Practice. Wiley Blackwell, pp: 134-142.

4 Maria C, Arciniegas C, Lobelo F, Jiménez MA, Páez DC, et al. (2016) One-day workshop-based training improves physical activity prescription knowledge in Latin American physicians: a pre-test posttest study. BMC Public Health 16: 1224.

5 Ricketts B (2011) The role of simulation for learning within pre-registration nursing education - A literature review. Nurse Educ Today 31: 650-654.

6 Aboumatar HJ, Thompson DA, Wu AW, Pronovost PJ, Dawson P, et al. (2012) Development and evaluation of a 3-day patient safety curriculum to advance knowledge, self-efficacy and system thinking among medical students. BMJ Quality and Safety 21: 416-422.

7 Ziv A, Rubin O, Sidi A, Berkenstadt H (2007) Credentialing and certifying with simulation. Anesthesiol Clin 25: 261-269.

8 Middleton B, Bloomrosen M, Dente MA, Hashmat B, Koppel R, et al. (2013) Enhancing patient safety and quality of care by improving the usability of electronic health record systems. J Am Med Inform Assoc 20: e2-e8.

9 Weller JM, Nestel D, Marshall SD, Brooks PM, Conn JJ (2012) Simulation in clinical teaching and learning. Med J Aust 196: 594.

10 Weller JM (2004) Simulation in undergraduate medical education: bridging the gap between theory and practice. Med Educ 38: 32-38.