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Salma Rattani

Zohra Kurji

Amina Aijaz khowaja AP

Jacqueline Maria Dias

Anila Naz AliSher

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Effectiveness of High-Fidelity Simulation in Nursing Education for End-of-Life Care: A Quasi-experimental Design

Salma Amin Rattani¹, Zohra Kurji¹, Amina Aijaz Khowaja¹, Jacqueline Maria Dias², Anila Naz AliSher³

¹School of Nursing and Midwifery, Aga Khan University, Karachi, Pakistan, ²College of Health Sciences, University of Sharjah, Sharjah, UAE, ³College of Nursing, King Edward Medical University, Lahore, Pakistan

Abstract

Background: Providing end of life (EOL) care is a component of palliative care but dealing with dying patients and their family members is stressful for the healthcare providers. To prepare them for providing EOL care, the high-fidelity simulation could be used as a pedagogy in which real-life scenarios are used on the computerized manikins mimicking the real patients. **Aims:** The aim of this study was to measure the effectiveness of high-fidelity simulation to teach EOL care in the palliative nursing course in the undergraduate nursing education program at the School of Nursing and Midwifery at Aga Khan University which is private university in Karachi, Pakistan. **Methods:** This study was approved by the ethics review committee of Aga Khan University. It was hypothesized that exposure to high-fidelity simulation will lead to an increased positive attitude in participants towards the care of dying. A quasi-experimental design was used. In line with the design, there was no control group. The same group of students ($n = 42$) were assessed through Frommelt Attitudes Toward Care of the Dying (FATCOD) Part B assessment tool. Permission for using this tool was obtained from Dr. Katherine Frommelt, the author of this tool. Research participants filled this tool before and after the intervention, i.e., providing EOL care to a patient in a high-fidelity simulation lab. **Results:** Out of 30-FATCOD items, significant attitude change was detected on 11-items of which 8 were positively worded statements and 3 were negatively worded statements. As per the hypothesis, it was expected for the positively worded statements that the mean score for the posttest would be significantly greater than the pretest mean score (pretest score < posttest score). The hypothesis was proved for items 1, 4, 10, 18, 22, 25, 27, and 30 as their t -value was significant at 0.05 alpha value (one-tailed). For the negatively worded statements, it was expected that the mean score for the posttest would be significantly lower than the pretest (pretest score > posttest score). The hypothesis was proved for items 5, 6, and 11 as their t -value was significant at 0.05 alpha value (one-tailed). **Conclusion:** In this research teaching, EOL care through high-fidelity simulation had improved the attitudes of students toward providing care. This pedagogy also provided the participants with a learning opportunity to deal with their own emotions. These findings provide a way forward for teaching EOL and other complex skills of clinical practice.

Keywords: Clinical teaching, end-of-life care, Frommelt Attitudes Toward Care of the Dying tool, high-fidelity simulation, nursing education, palliative care

INTRODUCTION

A multidisciplinary approach toward palliative care encompasses providing end of life (EOL) care and dealing with death and dying.^[1] Weisse *et al.* assert that the health-care providers report a lack of training in EOL care and limited opportunities to learn about the dying process of a person^[2] Nurses are required to support the patient and family during the dying process and bereavement. This process involves symptom control and pain management.^[3] However, nursing graduates do not feel prepared for providing palliative care^[2-4] and they acknowledge the need to increase palliative care education in undergraduate nursing curricula.^[2,3] Highlighting the importance of educating and

training nurses for providing palliative care, Pesut and Greig emphasize that nurses are the frontline care providers for patients and families at EOL. Therefore, it is essential that through education and training, these care providers are to be prepared for providing palliative care.^[5] Limited availability of clinical

Address for correspondence: Asst. Prof. Salma Amin Rattani, Aga Khan University School of Nursing and Midwifery, Karachi, Pakistan.
E-mail: rattani@ualberta.ca

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settings in nursing education may not allow direct experience in palliative and EOL care but the use of simulation-based learning may enable educators to foster the skills required for fulfilling the complex palliative care needs of their patients and their family members.^[6] Simulation is just like a real situation^[6,7] to provide learners with pertinent experience under the control conditions. The high fidelity allows the practical environment, typically the hospital as closely as possible, and it allows learners to practice their skills in a safe environment.^[6,7]

High-fidelity patient simulation refers to the use of computerized manikins that simulate real-life scenarios. The role of high-fidelity simulation in teaching complex skills including EOL care fosters the development of the skills related to the affective, psychomotor and cognitive domain of the healthcare providers. High-fidelity simulation enhances students' self-confidence and prepares them by providing a safe and supportive environment to learn. Researchers discovered that by learning through high-fidelity simulation during the undergraduate program, student nurses were able to build their attitudes and develop skills for providing EOL care.^[8-10] This pedagogical approach builds a bridge between fear of the unknown while caring for a dying person and it facilitates a meaningful death experience for patients and their families later in the field.^[11,12] However, in the context of Pakistan, use of high-fidelity simulation is still a novel approach.

Purpose of the study

Education of undergraduate nurses to care for EOL issues is vital.^[13] With this in mind, the simulated scenario was developed around EOL care and students were exposed to high-fidelity simulation scenarios. The aim of this study was to measure the effectiveness of high-fidelity simulation to teach EOL care in the palliative nursing course in the undergraduate nursing education program at the School of Nursing and Midwifery at Aga Khan University which is a private university in Karachi, Pakistan.

A literature search through electronic database including Google Scholar accessed through Google chrome and CINAHL Plus with Full Text and PubMed accessed through the University of Alberta (University of Alberta library is accessible to the primary author based on her status as candidate Ph. D in the faculty of Nursing at the University) library indicated a gap in the literature. These findings are similar to the reported in an earlier research in which the researchers in September 2018 in addition to above-mentioned database searched EBSCOhost, Ovid Medline, ERIC, PubMed, and Web of Science by using the search terms that reflected topics on EOL, nursing education, relevant prelicensure programs, simulation, and attitudes.^[14] Related to research in the context of Pakistan which was the focus of present research, no paper could be retrieved. This emphasizes the need is high for researching the effectiveness of teaching end-of-life care through high fidelity simulation. Thus the present study aims to fill a gap in the literature mainly from the Pakistani context.

Hypothesis

The hypothesis of this study was, "exposure to high-fidelity simulation will lead to an increased positive attitude in

participant students towards care of dying." In this study, there was no control group. Using a quasi-experimental study design the same group was assessed before and after the intervention "exposure to high-fidelity simulation." As the hypothesis stated above was one-directional "simulation will lead to an increased positive attitude in participant students towards care of dying" one tail *t*-test was applied with 0.05 level of significance and 95% confidence interval.

METHODS

Study design

The study used a quasi-experimental design with pre and post-intervention and there was no control group in this study. The same group was compared before and after attending a high fidelity simulation session. The study hypothesized that exposure to high-fidelity simulation will lead to an increased positive attitude in participants towards the care of dying.

Conceptual definition

Attitude

A bodily state of readiness to respond in a characteristic way to a stimulus such as a concept, or a situation.^[15]

Death and dying

Death is the EOL. Dying is the process of approaching death, including the choices and actions involved in that process.^[16]

Operational definition

Effect of EOL care through high fidelity simulation on the attitudes of undergraduate nursing students towards care of dying patients was the focus. Through the Frommelt Attitudes Toward Care of the Dying (FATCOD) tool participants' feelings, thoughts, behaviors, and comfort were assessed while they were providing nursing care to dying patients and their families.

Intervention

The entire process followed three stages; prebrief, simulation and debrief. Prior to a brief about the scenario, the participants were provided with the form of the FATCOD tool to be filled. After they filled the form they were divided into a small group of three. Hensel and Ball describing the effects of group size on the outcomes in high-risk, maternal-newborn simulations in their study, assert that smaller groups might be most beneficial when students are applying newer concepts or when scenarios are very complex. In their study noted a higher level of satisfaction in small groups and group size was associated with increased self-confidence for the newborn scenario which in their simulation was complex. Thus, they report that choices regarding simulation group size should be based on learning objectives, students' experience, and faculty resources.^[17] The scenario in the present study was complex, students' learning focused on dealing with a dying patient and caring for the patient's family. Faculty resources were a strength. The simulation lab at the Centre for Innovation in Medical Education (CIME) replicated patient care ward fully equipped with state-of-the-art medical devices and technology.^[18] The

entire process of high fidelity simulation was observed from the observation rooms having an advance sound system through which facilitators observed and communicated in real-time.

Members of each small group were prebriefed about the clinical scenario and each of them was assigned a role which was team leader, primary nurse, and secondary nurse.

The clinical scenario

A 70-year-old woman with the diagnosis of ovarian cancer was in the hospital setting. Her code status was “do not resuscitate,” and her pain was 8 on the scale of 0–10. Whereby “0” indicated “no pain” and “10” indicated “highest level of pain.” One of the family members of the patient was present as an attendant. This scenario was validated through the feedback from the expert in the high-fidelity simulation. Furthermore, this scenario was pilot tested on a group of 10 nurses from home health care settings providing care to the patients with diverse needs including EOL care. These 10 nurses were grouped into three subgroups; two groups of three and one group of four participants. Based on the feedback from the expert and pilot testing, the scenario was revised for actual intervention on the research participants who were the undergraduate student nurses. According to the scenario, parameters were set in the computerized simulator. This was a case of a female with a severe pain score 8 on the scale of 0–10, and the patient was at the EOL stage. The patient was verbalizing about her pain. Deterioration in her health condition was exhibited through hemodynamically change in her status; dyspnea, cyanosis, changes in the blood pressure and electrocardiogram, deteriorating level of consciousness and finally become unresponsive and death occurred. As the patient was deteriorating, the patient’s attendant who was present and other family members who entered the scenario were getting violent. The student participants’ performance was observed by the facilitators and was video recorded which was played for participants to watch and reflect on their performance and discuss in the debriefing. This process repeated multiple times as 42 participants were grouped in a group three to perform their roles in the abovementioned scenario. After the simulation and debriefing, the participants filled the FATCOD tool. Participants’ responses to the FATCOD tool were statistically analyzed and their pretest responses were compared with the posttest responses by comparing the difference in their means. These are presented in the results section.

Outcome measures

The outcome measures of the study were to prepare the participants for effective communication, address the physical, emotional, and spiritual needs of patients and the family members of the patients at the EOL care.

Primary outcome

Participants will achieve the outcome measure in the simulated lab by performing in the given scenario and will also practice their teamwork. This was assessed through the FATCOD tool at the 0.05 alpha level, 95% confidence interval with a standard deviation of 1.

Secondary outcome

Exposure to caring for a dying patient and dealing with the family will prepare the participants for this situation in a real clinical setting. This was assessed through students’ performance in theory in the actual clinical setting assessed through course evaluation criteria which were paper pen tests developed through a table of specification for the course components. The clinical performance which was in an actual clinical setting under the supervision clinical faculty was assessed through different methods of the clinical evaluation including clinical evaluation form all of these are part of course evaluation. This research focused on assessing the performance of the simulation lab measured through students’ responses to the FATCOD tool.

Population and setting

The population of the study was undergraduate student nurses enrolled in concepts of palliative nursing course which is a 3.0 credit course; 2.0 credit theory and 1.0 credit clinical. This course is in the post-RN BScN program at Aga Khan University School of Nursing and Midwifery Karachi, Pakistan. The program is of four semesters over a period of 2 years. The theory is covered through blended learning; face to face didactic teaching and discussion and through a-synchronized online discussion among students in small groups under the facilitation of a nursing faculty. For clinical students go to in-patient hospital settings. However, the high fidelity simulation labs are a recent development in the institution and to the best of researchers’ knowledge, it is the only available facility in Pakistan. Thus, the scholarship of research in this area needs to direct the pedagogical approaches in teaching and learning.

Sample size

The sample size was calculated using an online calculator of clinical and translational science institute for pre and poststudy by keeping the level of significance 0.05, beta (Type II Error) rate 0.2, effect size 0.43, and standard deviation of 1. The sample size was found to be 42 for this study. As in this, a total of 42 students were enrolled and all of them responded their agreement to participate in this study; all were included. Thus, a total of 42 students participated in this study.

Data collection and results’ analysis process

In this research, students’ attitudes were assessed before and after teaching EOL care through high-fidelity simulation in CIME. The student nurses were asked to fill FATCOD Part B assessment tool before and after simulation. Prior permission for using the FATCOD assessment tool was obtained from Katherine Frommelt, the author of this tool. Through this tool participants’ feelings, thoughts, behaviors, and comfort while providing nursing care to dying patients and their families were assessed.

Validity and reliability of the tool

The validity and reliability of the tool have been demonstrated in a previous study (Frommelt, 1991; Frommelt, 2003).^[19,20] Frommelt reported Cronbach’s alpha values of the tool 0.94

with nurses and 0.90 with use among nursing students. Internal consistency falls between 0.87 and 0.82, which depicted adequate reliability of the tool.^[19,20] English version of the tool was found reliable and consistent for students in the same study.^[19,20] The FATCOD consists of 30 Liker-type items, which are scored on a 5-point scale. The instrument is made up of an equal number of positively and negatively worded items. Possible responses to each item include SD=Strongly Disagree, D=Disagree, U=Uncertain, A=Agree and SA=Strongly Agree. Positive items are scored from 1 for Strongly Disagree to 5 for Strongly Agree. For Negative items the scoring is reversed. Items 1, 2, 4, 10, 12, 16, 18, 20, 21, 22, 23, 24, 25, 27, and 30 are all positively worded statements. (scored from 1 for Strongly Disagree to 5 for Strongly Agree). All others are negative. (scored from 1 for Strongly Agree to 5 for Strongly Disagree) (Frommelt, 1991, 2003).^[19,20]

Statistical methods

Participants' demographics were analyzed descriptively by calculating the frequencies and percentages. Responses to FATCOD assessment tool Part B were statistically analyzed by applying the *t*-test, and their means of items in the pretests were compared with the means of items in the posttests.

Ethical consideration

The study started after receiving permission from The Aga Khan University Ethics Review Committee. Students were given a hard copy of the consent form to read and signed consent was obtained from those who agreed to participate. Regardless of their agreement to participate or not to participate, all the students were taught EOL care through high-fidelity simulation, and their learning was not compromised. At the beginning of the simulation session, all the students were informed that during the session at any point in time if any of them feels emotionally distressed, the individual was allowed to leave the session. They were also informed that if any of them need an individual time for sharing feelings the individual's request will be respected. However, no request was received for any individual meeting.

RESULTS

Through a competitive pool applicant, grant for this research was received from the Scholarship of Learning and Teaching (SoLT) Network, Aga Khan University.

Research findings

Demographic characteristics of the participants

Table 1 presents the demographic characteristics of the participants. This study focused on the attitudes of nursing students toward the care of dying. All 42 students in the study were affiliated with the Aga Khan University School of Nursing and Midwifery. Of the 42 participants, 35 (83.3%) were female and 5 (11.9%) were male students. Two participants' entry was missing in the data collection form. Twenty-four students (57.1%) were in the age range of 23–27 years, while 17 students (40.5%) were in the age range of 28–35 years and only 1 student (2.4%) was in the age range of 36–45 years.

Table 1: Demographic characteristics of the participants

Demographic variables	Frequency (%)
Gender	
Female	35 (83.3)
Male	5 (11.9)
Age (years)	
23-27	24 (57.1)
28-35	17 (40.5)
36-45	1 (2.4)
Highest degree held	
High school equivalency	1 (2.4)
High school diploma	19 (45.2)
Bachelor's degree	14 (33.3)
Master's degree	2 (4.8)
Education beyond masters	2 (4.8)
Religion	
Islam	40 (95.2)
Christianity	1 (2.4)
Hinduism	1 (2.4)
Religious belief's influence on attitude toward death and dying	
Strong influence on attitude	37 (88.1)
Minor influence on attitude	3 (7.1)
No influence on attitude	1 (2.4)
Lack of religious belief's influence on attitude toward death and dying	
Strong influence on attitude	19 (45.2)
Minor influence on attitude	7 (16.7)
No influence on attitude	7 (16.7)
Previous education on death and dying	
Took a course in death and dying previously	8 (19.0)
Did not take a specific course on death and dying, but material on the subject was included in other courses	27 (64.3)
No information dealing with death and dying	6 (14.3)
Previous experience of dealing with terminally ill	
Have experience	37 (88.1)
Have no experience	5 (11.9)
Previous experience with loss	
Lost someone close - immediate family (husband, wife, mother, father)	10 (23.8)
Lost someone close - significant other	7 (16.7)
Lost someone - not specified	1 (2.4)
Have not lost someone	24 (57.1)
Present experience of loss	
Presently anticipating loss of loved one	8 (19.0)
Presently have a loved one who is terminally ill	2 (4.8)
Not dealing with any impending loss	31 (73.8)

Nursing students were also asked to provide their highest degree and the majority that is 19 (45.2%) participants had a high school diploma.

The participant was also asked to share their religious attitudes and their previous experiences with EOL care in the FATCOD demographic questionnaire. Of the 42 students, 40 (95.2%) followed religion Islam, while 1 (2.4%) followed Christianity and 1 (2.4%) followed Hinduism.

When students were asked how their religious beliefs influenced their attitude toward death and dying, the majority that is 37 (88.1%) participants responded that it had a strong influence on their attitude. Though, when students were inquired whether the lack of religious belief influenced their attitude toward death and dying, responses varied. Nineteen (45.2%) participants responded that the lack of religious belief strongly influenced their attitude toward death and dying. While 7 (16.7%) participants responded that the lack of religious belief had a minor influence and 7 (16.7%) participants responded that the lack of religious belief had no influence on their attitude. It is also important to mention the missing/double entry category because of its high frequency that is 9 (21.4%) participants.

Twenty-seven (64.3%) participants had not taken a specific course on death and dying previously but were familiar with the subject, while 8 (19.0%) participants had taken a course before. Six (14.3%) participants had no previous information about death and dying and 1 (2.4%) participant had not responded to this question.

Thirty-seven (88.1%) participants had experience of caring for the terminally ill, while only 5 (11.9%) participants had no experience of caring for the terminally ill. The participants also responded to their experience with loss. Twenty-four (57.1%) participants had not lost someone close, while 18 (42.9%) participants had lost someone close to them. Of those 18 participants, 10 participants had lost an immediate

family member, seven participants had lost a significant other, while one respondent had not marked an entry. When questioned about the present experience of loss, among all the participants ($n = 42$) majority 31 (73.8%) participants were not dealing with any impending loss.

7-test results

A paired sample *t*-test was applied to compare the difference in mean of pretest item to the mean of posttest item to identify if a significant positive change in attitude resulted after students were exposed to high-fidelity simulation. Results were analyzed using the Statistical Package for Social Sciences of International Business Machines (IBM) Corporation, Armonk, New York, United States of America (USA). This package deleted the missing response from the degree of freedom (df) noted for each item through a difference in total numbers (*N*) and df in Table 2.

Out of 30-FATCOD items, significant attitude change was detected on 11-items [Table 2] of which 8 were positively worded statements and 3 were negatively worded statements.

As per the hypothesis, it was expected for the positively worded statements that the mean score for the posttest would be significantly greater than the pretest mean score (pretest score < posttest score). The hypothesis was proved for items 1, 4, 10, 18, 22, 25, 27, and 30 as their *t*-value was significant at 0.05 alpha value (one-tailed). For the negatively worded statements,

Table 2: Paired sample *t*-test result for significant Frommelt Attitudes towards Care of the Dying items

Item number	Item	Condition	Mean	<i>n</i>	<i>t</i>	df	<i>P</i> (sign at one-tailed)
Positive items							
1	Giving care to the dying person is a worthwhile experience	Pre	3.90	42	-2.553	41	0.007*
		Post	4.43				
4	Caring for the patient's family should continue throughout the period of grief and bereavement	Pre	4.31	42	-1.969	41	0.028
		Post	4.64				
10	There are times when death is welcomed by the dying person	Pre	3.60	42	-1.732	41	0.045
		Post	3.90				
18	Families should be concerned about helping their dying member make the best of his/her remaining life	Pre	4.38	42	-2.172	41	0.018
		Post	4.69				
22	Care should extend to the family of the dying person	Pre	4.07	42	-1.969	41	0.028
		Post	4.40				
25	Addiction to pain relieving medication should not be a concern when dealing with a dying person	Pre	3.18	40	-1.928	39	0.031
		Post	3.60				
27	Dying persons should be given honest answers about their condition	Pre	3.95	40	-2.106	39	0.021
		Post	4.30				
30	It is possible for nonfamily care-givers to help patients prepare for death	Pre	3.79	42	-1.931	41	0.030
		Post	4.12				
Negative items							
5	I would not want to care for a dying person	Pre	1.48	42	1.839	41	0.036
		Post	1.29				
6	The nonfamily caregivers should not be the one to talk about death with the dying person	Pre	2.20	40	2.814	39	0.004*
		Post	1.75				
11	When a patient asks, "Am I Dying?" I think it is best to change the subject to something cheerful	Pre	2.17	42	1.959	41	0.028
		Post	1.86				

**t*-value is significant at 0.01 alpha-level

it was expected that the mean score for the posttest would be significantly lower than the pretest (pretest score > posttest score). The hypothesis was proved for items 5, 6, and 11 as their *t*-value was significant at 0.05 alpha value (one-tailed).

DISCUSSION

The current study indicated that teaching EOL care through high fidelity simulation has a positive effect on the attitudes of undergraduate nursing students towards the care of dying patients. Besides, the results of the study also demonstrated a significant improvement in the negative attitudes of the participants after the intervention ($P < 0.05$). These findings support Eaton *et al.* (2012), Fluharty *et al.* (2012), and Ladd *et al.* (2013) reporting that the use of high fidelity simulation to teach EOL care in undergraduate nursing programs provides the students with experiential learning. Thus, preparing them to practice in a real-life clinical setting.^[21-23]

The result of the current study highlight that caring for a dying patient was a worthwhile experience for most of the participants after simulated experience ($P = 0.007$). Similar findings were reported by Strang *et al.*, (2014), Lewis *et al.* (2016), and Leombruni *et al.* (2014).^[24-26] The results of the present study also demonstrated that participants' attitudes positively changed on the negative item #11 that is "When a patient asks, "Am I Dying?" I think it is best to change the subject to something cheerful." In this item, posttest scores decreased (1.86) from the pretest score (2.17). This finding is in agreement with Dunn *et al.* (2005) who reported that nurses perceive death as a natural aspect of a person's life and consider death neither good nor bad.^[27] Likewise, this study results showed participants' positive change in negative item #5; "I would not want to care for a dying person" with a mean score of 1.48 pre score results and a mean score of 1.29 in the post score results. These findings are consistent with a study by Mallory (2003) who found that participants in a death education course revealed a reduction in negative attitudes as compared with the control group in terms of attending a dying patient.^[28]

The current study also revealed that narcotics as a pain reliever was a concern for the majority of the student nurses for making patient addicted and was not considered as part of the comfort care of a dying person. These findings are similar to the findings reported by Aiello-Laws *et al.* and Ameringer (2009) and Lovell *et al.* (2015) who reported that pain remains untreated in many cancer patients and exposure to high fidelity simulation significantly changes health professionals' attitude regarding the concern of pain management in EOL care.^[29,30]

Family is an integral part of the care of dying patients. The present study also brought positive change in nursing students' attitudes. After exposure to simulation activity, they were more ready to extend the care to the family of the dying person. This substantiates previous findings in the literature that families of dying patients also need emotional support to accept reality.^[29]

Since most of the findings support the use of high fidelity simulation for teaching EOL care to undergraduate student nurses for developing their competence in caring for EOL. There is a clear need to implement this strategy on a large scale in Pakistan and other countries of a similar context where high fidelity simulation is still a new concept. Participation in this type of learning also allows the undergraduate nursing students to improve their attitudes extended care to the family in EOL, which may translate to enhance holistic care for their future nursing practice.^[29,30]

Limitation of the study

FATCOD Part B assessment scale is self-administered tool; the most serious concerns of self-reports are the validity and accuracy of the self-report. Respondents might distort the response to match social desirability.^[31]

CONCLUSION

Teaching EOL care through high-fidelity simulation had improved the attitudes of students towards the care of dying patients and their grieving family members. Moreover, this pedagogy also provided the students with a learning opportunity to deal with their own emotions. Study results can guide the pedagogical approach for teaching complex skills.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Sekse RJ, Hunskaar I, Ellingsen S. The nurse's role in palliative care: A qualitative meta-synthesis. *J Clin Nurs* 2018;27:e21-38.
2. Weisse CS, Melekis K, Hutchins B. Providing end-of-life care: Increased empathy and self-efficacy among student caregivers in residential homes for the dying. *Am J Hosp Palliat Care* 2019;36:538-45.
3. Bergdahl E, Ternstedt BM, Berterö C, Andershed B. The theory of a co-creative process in advanced palliative home care nursing encounters: A qualitative deductive approach over time. *Nursing Open* 2019;6:175-188.
4. Croxon L, Deravin L, Anderson J. Dealing with end of life-new graduated nurse experiences. *J Clin Nurs* 2018;27:337-44.
5. Pesut B, Greig M. Resources for educating, training, and mentoring nurses and unregulated nursing care providers in palliative care: A review and expert consultation. *J Palliat Med* 2018;21:S50-6.
6. Smith MB, Macieira TG, Bumbach MD, Garbutt SJ, Citty SW, Stephen A, *et al.* The use of simulation to teach nursing students and clinicians palliative care and end-of-life communication: A systematic review. *Am J Hosp Palliat Care* 2018;35:1140-54.
7. Lateef F. Simulation-based learning: Just like the real thing. *J Emerg Trauma Shock* 2010;3:348-52.

8. Doherty L. Survey shows 'woeful' lack of basic training in end-of-life care. *Nurs Stand* 2008;23:6-7.
9. Jones F, Passos-Neto CE, Braghiroli OF. Simulation in medical education: Brief history and methodology. *Princ Pract Clin Res* 2015;2:56-63.
10. Sprinks J. Nurses lack confidence in providing end of life care: Staff need more training, and time, to hold difficult conversations with patients. *Nurs Older People* 2011;23:6-8.
11. Smith-Stoner M. Using high-fidelity simulation to educate nursing students about end-of-life care. *Nurs Educ Perspect* 2009;30:115-20.
12. Kunkel C, Kopp W, Hanson M. A matter of life and death: end-of-life simulation to develop confidence in nursing students. *Nurs Educ Perspect* 2016;37:285-6.
13. Matchim Y, Raetong P. Thai nursing students' experiences of caring for patients at the end of life: A phenomenological study. *Int J Palliat Nurs* 2018;24:220-9.
14. Lewis-Pierre L, McKay M, Sanko J, Gattamorta K, Azaiza K. comparing educational outcomes of online module-based technology with and without simulation on attitudes toward care of the dying in second semester BSN students. *J Palliat Care* 2019;34:218-23.
15. Merriam-Webster, Incorporated. Definition of attitude. Merriam-Webster online dictionary 2020; accessed from <https://www.merriam-webster.com/dictionary/attitude>. [Last accessed on 2020 Jan 15].
16. Farlex. The free dictionary. Death and dying. Accessed from <https://legal-dictionary.thefreedictionary.com/Death+and+Dying>. [Last accessed on 2020 Jan 15].
17. Hensel D, Ball S. The Effects of Group Size on Outcomes in High-Risk, Maternal-Newborn Simulations. *IU Scholars Work*; 2013.
18. The Aga Khan University. Centre of Innovation in Medical Education. The Aga Khan University; 2019.
19. Frommelt KH. The effects of death education on nurses' attitudes toward caring for terminally ill persons and their families. *Am J Hosp Palliat Care* 1991;8:37-43.
20. Frommelt KH. Attitudes toward care of the terminally ill: An educational intervention. *Am J Hosp Palliat Care* 2003;20:13-22.
21. Eaton MK, Floyd K, Brooks S. Student perceptions of simulation's influence on home health and hospice practicum learning. *Clin Simul Nurs* 2012;8:e239-47.
22. Fluharty L, Hayes AS, Milgrom L, Malarney K, Smith D, Reklau MA, *et al.* A multisite, multi-academic track evaluation of end-of-life simulation for nursing education. *Clin Simul Nur* 2012;8:e135-43.
23. Ladd C, Grimley K, Hickman C, Touhy TA. Teaching end-of-life nursing using simulation. *J Hosp Palliat Nurs* 2013;15:41-51.
24. Strang S, Bergh I, Ek K, Hammarlund K, Pahl C, Westin L, *et al.* Swedish nursing students' reasoning about emotionally demanding issues in caring for dying patients. *Int J Palliat Nurs* 2014;20:194-200.
25. Lewis C, Reid J, McLernon Z, Ingham R, Traynor M. The impact of a simulated intervention on attitudes of undergraduate nursing and medical students towards end of life care provision. *BMC Palliat Care* 2016;15:67.
26. Leombruni P, Marco M, Andrea B, Francesca Z, Castelli L, Torta R. Attitudes toward caring for dying patients: An overview among Italian nursing students and preliminary psychometrics of the FATCOD-B scale. *J Nurs Educ Pract* 2014;4:188-96.
27. Dunn KS, Otten C, Stephens E. Nursing experience and the care of dying patients. *Oncol Nurs Forum* 2005;32:97-104.
28. Mallory JL. The impact of a palliative care educational component on attitudes toward care of the dying in undergraduate nursing students. *J Prof Nurs* 2003;19:305-12.
29. Aiello-Laws L, Reynolds J, Deizer N, Peterson M, Ameringer S, Bakitas M. Putting evidence into practice: What are the pharmacologic interventions for nociceptive and neuropathic cancer pain in adults? *Clin J Oncol Nurs* 2009;13:649-55.
30. Lovell M, Luckett T, Boyle F, Stubbs J, Phillips J, Davidson PM, *et al.* Adaptation of international guidelines on assessment and management of cancer pain for the Australian context. *Asia Pac J Clin Oncol* 2015;11:170-7.
31. Lippe MP, Becker H. Improving attitudes and perceived competence in caring for dying patients: An end-of-life simulation. *Nurs Educ Perspect* 2015;36:372-8.