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Knowledge and perception towards clinical simulation in teaching undergraduate nursing students among nurse educators working at teaching institutions in Addis Ababa, Ethiopia

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1. Introduction

Nursing is a practice-based profession that is built on theoretical knowledge, both of which is gained through a program of nursing education (Debisette et al., 2010). Nursing education faces the challenge of preparing graduates to face the complexities that are found in today's healthcare environment. Upon graduation, new nurses must be able to care for patients in a fast-paced environment that emphasizes clinical competence and accurate, and timely decision-making skills (Tuttle, 2009).

Simulation is a teaching and learning strategy that is increasingly used in nursing education to prepare students for the clinical workplace. It is defined by Jeffries as activities that mimic the reality of a clinical environment and is designed to demonstrate procedures, decision making, and critical thinking through different techniques like role play and using manikins (Edgecombe Phillipa Seaton, Monahan, Meyer, LePage, & Erlam, 2013).

A simulation can be very detailed and closely simulate reality, or it can be a group of components that are combined to provide some resemblance of reality (Edgecombe Phillipa Seaton et al., 2013). Simulations vary in the technology they utilized, based on this, simulations ranges from low-fidelity; consisting of case studies or written patient scenarios where students engage in problem-based learning, to high-fidelity; where high-tech mannequins are utilized to generate highly realistic scenarios (Tuttle, 2009).

Simulation in the education of healthcare practitioners is not a new concept. On their review of simulation history in nursing education, Nehring and Lashley noted that anatomical models were used in nursing schools as early as 1847. Furthermore, in 1919 lecture topics and list of equipment and materials for the demonstration of skills were included in the national standard curriculum for nursing program which is developed by the National League of Nursing Education. (Nehring & Lashley, 2009).

Several factors have been proposed in different texts for the increased use of clinical simulation in nursing education. According to Piscotty et al. lack of available clinical sites, time, and faculty constraints have promoted the development of effective simulation methods (Piscotty, Grobbel, & Tzeng, 2011). Similarly, Feingold et al. reported that the use of simulation has grown in nursing education as the result of increased availability of technology and the benefits offered to students and teachers (Feingold, Calaluce, & Kallen, 2004).

The advantages of implementing clinical simulation in nursing education have been supported by numerous studies. For instance, in a review done by Lapkin et al., it is stated that simulation improved critical thinking, skills performance, and knowledge of subject matter, which often translate into improved patient care (Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010). The effectiveness of simulation depends on the knowledge of educators. This is supported by Melnyk et al. who report, nurses who believed they were knowledgeable about the evidence-based practice were more likely to teach evidence-based practice to others as compared to those who believe otherwise (Melnyk, Fineout-Overholt, Gallagher-Ford, & Kaplan, 2012). Thus, nurse educators need to learn and master new instructional skills to implement simulation effectively in clinical teaching (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014; Hussein and Hussein, 2014, Katoue, iblagh, somerville, & ker, 2015).

Several barriers that hinder the use of clinical simulation by nurse educators are stated by several studies. As reported by Adamson, lack of time for preparation and lack of support of faculty to run the clinical simulation scenarios are significant barriers affecting educator use of simulation (Hollema, 2015). Similarly, another studies identify challenges educators face to apply clinical simulation including; time restriction, lack of trainers experienced to use it, not applicable/attitude, lack of space and equipment/scheduling the lab, funding, cost of simulation equipment and engaging all students while a few are involved in simulation (Kelly, 2014).

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With a paradigm shift toward student-centered learning, traditional teaching methods such as lecture and PowerPoint presentations are no longer considered effective for developing student's skill. Nurse educators must develop realistic learning experiences that support student transition to the clinical setting while ensuring safe and competent graduates who are prepared for the technological advances in nursing practice (Alfes, 2011).

In Ethiopia, newly qualified nurses face the difficulty of transferring what they study into their workplace. A cross-sectional study done in Ethiopia on 2013 regarding the competency level of newly graduated nurses and midwives found that the average competency level was 51.8%, which shows the newly graduated are not as competent as it is required (Yigzaw et al., 2015). Several factors has been identified in studies for incompetence of newly graduated nurses, including gaps between school and the clinical workplace, shortage of clinical site, lack of professional knowledge and skills, lack of confidence in providing independent care, lack of familiarity with medical devices or procedures for machines or tests and responding to ambiguous or unfamiliar orders and diagnoses (Tseng, Hsieh, Chen, & Lou, 2013; Yigzaw et al., 2015, Tuttle, 2009). Thus, introducing clinical simulation in nursing education is one of the fundamental strategies to improve nurse and midwives competency to provide quality healthcare for the public and continue the growth of nursing and midwifery as a profession.

In the national context, studies that aim to investigate the utilization and application of nursing clinical simulation programs in nursing education have not been found in the literature search. Moreover, even in an international context even though there are a lot of studies aiming toward evaluating the effectiveness of clinical simulation in educating nurses, those that aim to specifically assess the standpoint of nurse educators towards clinical simulation are absent. Therefore, the aim of this study was to assess the knowledge and perception of nurse educators toward clinical simulation and associated factors with the practice of clinical simulation in nursing.

2. Objectives

The general objective of this study was to assess the knowledge and perception towards nursing clinical simulation among nurse educators working at teaching institutions in Addis Ababa, Ethiopia. In addition, this study aimed to identify factors associated with nursing clinical simulation among nurse educators working at teaching institutions in Addis Ababa, Ethiopia.

3. Methods

The study was carried out from March 03, 2016 to March 30, 2016, in Addis Ababa, Ethiopia. There are over 150 registered higher education institutions nationwide in Ethiopia, from which approximately half of them are found in Addis Ababa (Wikipedia). For this study, only nationally accredited health science teaching institutions located in Addis Ababa, which have a bachelor's degree program in Nursing were considered. Hence, seventeen teaching institutions are identified and the educators who work at this institution were the study subjects of the study (Relevance & Agency, 2013).

4. Sampling & sampling technique

Using the formula to calculate a single population proportion with the P = estimated proportion of nurse educators' knowledge and perception towards clinical simulation (50%), d = the margin of sampling error tolerated (5%) and $z_{\alpha/2}$ = the standard normal variable at $(1-\alpha)$ confidence level (5% = 1.96); the sample size was 384. But, since the population at hand is less than 10000, a correction formula was used to calculate the final sample size. Therefore, the final sample size computed is 93. Finally, by adding a non-response rate of 10%, the sample size that was used in this study was 103.

For ensuring maximum representativeness and the gathering of adequate sample size, 9 (nine) health science teaching institutions engaged in conducting a degree program in nursing were selected randomly using lottery method among the seventeen teaching institutions found in Addis Ababa. The selected colleges had a total of 122 nurse educators who have educational qualification of at least a bachelor's degree. Using a proportion technique, the calculated sample is allocated to the nine colleges.

$$\frac{\text{Number of instructors in the institution}}{\textit{total number of instructors in the nine institution}} \times \textit{total sample size} = \textit{allocated number}$$

Following this, individuals were selected randomly in institutions where the total number of eligible instructors is higher than the allocated number. For instance, in Addis Ababa university there were 44 instructors who fulfill the inclusion criteria, thus the 37 instructors allocated for this institution were selected randomly from the 44 eligible instructors. Finally, nurse educators that were available and present at their work settings participated in the quantitative data gathering; and repeated attempts were made until the desired number was reached.

5. Data collection and instruments

Data was collected by using a semi-structured questionnaire in English which was designed to meet the study objectives. The questionnaire has three major parts; the first part consisting of demographic questions (gender, work experience, educational status), the second including 11 questions which aimed at assessing knowledge towards clinical simulation and the final section composing 4 questions aimed at assessing perception among nurse educators towards clinical simulation.

Content validity of the questionnaire was assessed using two experts and meanings of all items was checked accordingly. Items interpretability and understandability by the study participants were evaluated by pre-testing the questionnaire on 8 nurse educators working at Adigrat University and necessary correction was taken accordingly, including adding response options for multiple answer questions. The questionnaire was also provided in the original language of English, avoiding the need for translation and maintaining consistency of the questions and responses.

For quantitative data collection, the pre-tested self-administered semi-structured questionnaire was hand delivered to selected nurse educators and lecturers in their working environments. A written information sheet with a section of informed consent was attached to the questionnaire to ensure all participants get the same directions and information.

6. Operational definitions

Knowledgeable: respondents were considered knowledgeable if they correctly answered more questions than the mean score among the eight questions aimed at assessing knowledge towards clinical simulation in nursing education. Some items contained multiple responses thus, every single response was marked as one question by itself.

Not-Knowledgeable: respondents are considered not-knowledgeable if they answered fewer questions than the mean score among the eight questions aimed at assessing knowledge towards clinical simulation in

nursing education. Some items contained multiple responses thus, every single response was marked as one question by itself.

Positive Perception: respondents were said to have positive perception if they scored above the median score of the four questions aimed at assessing perception towards clinical simulation in nursing education.

Negative Perception: respondents are said to have a negative perception if they scored below the median score of the four questions aimed at assessing perception towards clinical simulation in nursing education.

7. Data processing and analysis

The collected data were checked for completeness and inconsistencies before the analysis process. The responses for the completed questionnaires were coded and entered to the data entry template and later analyzed by using IBM SPSS Statistics for Windows version 20. Descriptive statistics were used for describing variables and analysis was run to identify associations such as relationships between the components of the dependent variables as-well-as between the dependent and independent variables. Bivariate and multivariate regression analysis were also computed to assess the statistical association between variables. This was done by using odds ratio and significance of statistical association was assured or tested using 95% confidence interval and p-value (< 0.05). Finally, the results were summarized and presented by texts, graphs, frequency tables, and other summary statistics.

8. Results

8.1. Socio-demographic characteristics

A total of 103 educators were identified from teaching institutions located in Addis Ababa, Ethiopia. Among these, four did not take part in the study because of the refusal of participation. This resulted in a final sample size of 99 with a response rate of 96.1%.

Among the 99 respondents, 79(79.8%) of them were government employees and the remaining 20(20.2%) were private health science college employees. Most of the respondent in this study were Male 67(67.7%), with the respondents mean age being 32.66 + 7.791. Furthermore, 22(22.2%) of the respondent hold a bachelor's degree whereas 75(75.8%) hold a master's degree. Of all the 99 nurse educators participated in this study 40(40.4%) reported having a teaching experience of above 5 years whereas 32(32.3%) reported that they had a teaching experience of 2–5 years (Table 1).

Table 1
Socio-demographic characteristics of nurse educators in Addis Ababa, Ethiopia March 2016.

Variables	Frequency(n = 99)	Percentage
Educational institution		
Governmental	79	79.8
Private	20	20.2
Gender		
Male	67	67.7
Female	32	32.3
Educational qualification		
Bachelor's Degree	22	22.2
Master's Degree	75	75.8
Doctorate Degree (PhD)	2	2.0
Teaching Experience		
6 months- 1 year	6	6.1
1–2 years	21	21.2
2–5 years	32	32.3
Above 5 years	40	40.4

Table 2
Distribution of knowledge of some basic concepts of nursing clinical simulation among nurse educators, Addis Ababa, March 2016.

Variables	Frequency	Percentage
Familiar with Clinical simulation		
Yes	87	87.9
No	11	11.1
I'm not sure	1	1
Knowledgeable about Clinical simulation		
Yes	65	65.7
No	22	22.2
I'm not sure	12	12.1
Mode of Clinical simulation classification		
By Fidelity	57	57.57
By mode of using	36	36.36
Computerized mannequins are which type of clinical simulation		
High Fidelity	41	53.2
Medium Fidelity	28	36.4
Low Fidelity	8	10.4
Case studies and written patient scenarios are which type of clinical simulation		
High Fidelity	28	36.4
Medium Fidelity	37	48.1
Low Fidelity	12	15.6
Mannequins which can slightly mimic reality are which types of clinical simulation		
High Fidelity	40	51.9
Medium Fidelity	26	33.8
Low Fidelity	11	14.3
Where does clinical simulation session take place?		
Clinical practice areas	35	45.5
Clinical skill rooms	62	80.5
Classrooms	32	41.6
All simulation sessions required debriefing sessions?		
Yes	63	81.8
No	14	18.2
Clinical Simulation is a form of?		
Active learning	69	89.6
Passive Learning	8	10.4
Communication and teamwork are essential for clinical simulation?		
Yes	76	98.7
No	1	1.3

8.2. Nurse educator's knowledge toward clinical simulation

Participants were asked if they are familiar with clinical simulation and 87(87.9%) of them responded that they are familiar with clinical simulation. Of those said they are familiar most 62(70.5%) of them mentioned training as the means which they get familiar with it followed by reading 24(27.3%). Respondents also asked if they are knowledgeable about clinical simulation and 65 (65.7%) said they are knowledgeable, 12(12.1%) of them respond "I am not sure" (see Table 2).

When asked how clinical simulation can be classified 57(57.57%) of the 77 respondents respond by fidelity whereas 36(36.36%) said by mode of use. The majority of respondents 41(53.2%) think that computerized mannequins are high fidelity type of clinical simulation. In a

similar question, 37(48.1%) of the 77 respondents think case studies and written patient scenarios are medium fidelity clinical simulation followed by 28(36.4%) who thinks these are high fidelity types of clinical simulation. Of the respondents, 40(51.9%) thinks mannequins which can slightly mimic reality are high fidelity types of clinical simulation.

When asked about where clinical simulation sessions take place 62(80.5%) of the 77 respondents answered clinical skill rooms, 35(45.5%) responded in clinical practice areas and 32(41.6%) of them said in classrooms. On which type of benefits can gain from teaching through clinical simulation most of the respondents 71(92.2%) said students can develop their skills. Most of the participant also responded that clinical simulation is beneficial to improve the student's confidence, knowledge, and decision-making skill, quality of care and patient's safety.

Eleven questions were used to assess the knowledge of nurse educators toward clinical simulation. Scores for each knowledge related question were summarized and the responses categorized into two variables, namely correct and incorrect. Nurse educators who answered the questions which aimed at assessing knowledge towards clinical simulation correctly were classified in the correct responses category while respondents who gave incorrect or missing answers were classified in the incorrect category. Each response in multiple response questions was counted as a question by themselves and marked as they are.

Based on the correct and incorrect responses each respondent gave, a count was made for each respondent. Then the aggregate scores of each of the 99 respondents were used to calculate mean, median and other descriptive statistics. Based on these results and the operational definition, respondents who have correctly answered more than the mean among the questions that were aimed at assessing knowledge towards clinical simulation were to be considered as knowledgeable. Accordingly, out of the 99 respondents, 5.14 was the mean score among the 11 knowledge related questions that were asked. Based on this, 59 (59.6%) of the 99 respondents were classified as knowledgeable, whereas the remaining 40 (40.4%) of the respondents were deemed to be not knowledgeable.

8.3. Nurse educators perception towards clinical simulation

Most of the respondents 83 (83.8%) agreed that clinical simulation improves students' knowledge/skill, critical thinking, and confidence. Similarly, most of the respondents 92(92.5%) either agreed or somewhat agreed that the knowledge gained through clinical simulation can be transferred in the real clinical setting. In addition, 89(89.9%) of the respondent agreed or somewhat agreed that clinical simulation can be used as one way to evaluate students. Furthermore, when the question whether clinical simulation can replace a real clinical practice setting or not raised 34(34.3%) agreed with the opinion, 27(27.3) of them somewhat agreed and 10(10.1) and 12(12.2%) of the respondents disagreed and somewhat disagreed with the idea respectively.

From 99 of the participants, majority 60(60.6%) of the respondents agreed and somewhat agreed that there should be a minimum requirement of a bachelor's degree for an educator to conduct a clinical simulation session. Most of the educators 80 (80.9%) respond agreed and somewhat agreed for the question whether there should be a minimum set of experience needed to conduct a clinical simulation session or not. Furthermore, the majority 46(46.5%) of the respondents disagreed with the idea of age limit for an instructor to teach through clinical simulation. Fifty-three (53.5%) of the respondents agreed or somewhat agreed that non-faculty nurses can conduct a simulation session whereas 31(31.3%) disagreed or somewhat disagreed with the idea (see Table 3).

Table 3
Distribution of perception related responses towards clinical simulation among nurse educators, Addis Ababa, March 2016.

Variables	Frequency	Percentage
Students will improve knowledge, critical thinking and confidence after simulation education		
Disagree	1	1
Somewhat Disagree	3	3
Uncertain	1	1
Somewhat Agree	11	11.1
Agree	83	83.8
Instructors need to hold at least a bachelor's degree to conduct a clinical simulation session.		
Disagree	14	14.1
Somewhat Disagree	10	10.1
Uncertain	15	15.2
Somewhat Agree	30	30.3
Agree	30	30.3
There should be a minimum set of experience needed to conduct a clinical simulation session		
Disagree	4	4
Somewhat Disagree	4	4
Uncertain	11	11.1
Somewhat Agree	15	15.2
Agree	65	65.7
At least Six months of experience is needed to conduct a clinical simulation session		
Disagree	10	10.1
Somewhat Disagree	8	8.1
Uncertain	16	16.2
Somewhat Agree	25	25.3
Agree	40	40.4
Knowledge gained by clinical simulation can be transferred into the real clinical setting		
Disagree	1	1
Somewhat Disagree	0	0
Uncertain	6	6.1
Somewhat Agree	21	21.2
Agree	71	71.7
Teaching through clinical simulation can replace real clinical setting		
Disagree	10	10.1
Somewhat Disagree	12	12.1
Uncertain	16	16.2
Somewhat Agree	27	27.3
Agree	34	34.3
Non-faculty nurses can conduct a clinical simulation session		
Disagree	21	21.2
Somewhat Disagree	10	10.1
Uncertain	25	25.3
Somewhat Agree	26	26.3
Agree	17	17.2
There should be an age limit for an instructor to teach through clinical simulation		
Disagree	46	46.5
Somewhat Disagree	12	12.1
Uncertain	14	14.1
Somewhat Agree	14	14.1
Agree	13	13.1
Clinical simulation can be used as one way to evaluate students		
Disagree	5	5.1
Somewhat Disagree	1	1
Uncertain	4	4
Somewhat Agree	19	19.2
Agree	70	70.7
Barriers that hinder the application of clinical simulation teaching methodology		
Time spent on preparation	46	46.5
Lack of support by faculty	60	60.6
Lack of training and knowledge	63	63.6
Lack of space	67	67.7
Lack of equipment	85	85.9
Lack of funding	60	60.6
Cost of simulation equipment	69	69.7
Lack of motivation	49	49.5

For the four questions targeted to assessing educator's perception toward clinical simulation were summarized into two groups in which responses of agree and somewhat agree grouped into an "agree" group similarly responses of disagreeing and somewhat disagree grouped into a "disagreed" group. Respondents who scored the median (4.00) and above were grouped as having a positive perception toward clinical simulation. Seventy-four (74.7%) of the respondent found to have a positive perception toward clinical simulation.

8.3.1. Statistical analysis

Linear logistic regression analysis was carried out, which showed that current educational qualification of nurse educators has a statistically significant association with knowledge towards nursing clinical simulation (with p-value < 0.05). However, the institution where they work, age, gender and teaching experience of respondents did not show a statistically significant association with knowledge towards nursing clinical simulation.

Regarding the association between participants' current educational qualification and nurse educator's knowledge toward clinical simulation, those who have a bachelor's degree were almost four times more likely to be knowledgeable than those who have master's degree with an AOR of 3.85 and 95% CI (1.177, 12.43).

In addition, binary logistic regression was performed to assess the association between the independent variables and educator's perception toward clinical simulation. A statistical significance between institution where educators' work and perception toward clinical simulation was found. In which educators' working at private teaching institution were found eight times more likely to have a positive perception toward clinical simulation than those who worked governmental institution at with COR of 0.045 and 95% CI (0.015, 0.953). Whereas the remaining independent variables failed to show any statistically significant association with the perception of educators toward clinical simulation.

9. Discussion

The main aim of this research was to examine the overall knowledge and perception of nurse educators towards clinical simulation. In both the national and international contexts, studies that specifically aim to assess the existing awareness, knowledge or outlook of nurse educators towards clinical simulation are a handful. The study has attempted to address this by assessing the level of knowledge and perception towards clinical simulation and identify factors associated with clinical simulation.

The study showed that 87(87.9%) of the 99-respondent claimed that they are familiar with clinical simulation. Of those who claimed they are familiar with clinical simulation 63(63.7%) thinks they are knowledgeable. This study later found that 59(59.6%) of the respondent to have adequate knowledge about clinical simulation. In a study which has the utmost similarity though being different in what it aimed to assess, a Nigerian study aimed at finding out educators' knowledge and belief towards Evidence-based Practice, found that among 88% of respondents who claimed to have knowledge towards EBP, 65% were later found to be not knowledgeable (Hussein and Hussein, 2014). On this study, it has been found that training is the most mentioned way in which respondents got familiar with a clinical simulation which suggests that training is an effective way to introduce educators with a new concept in health educations.

This study found a statistically significant association between educators' educational qualification and educators' knowledge toward clinical simulation where nurse educators who have a bachelor's degree showed a better knowledge than those who hold master's degree. This might be due to the fact that those who have a bachelor's degree are usually fresh graduates and might find understanding new teaching methodology easy. Furthermore, they are also the closest to technologies like the internet, where they can get familiar with new concepts.

The study found that only 57(57.7%) of the participants were able to determine clinical simulation classification and the place where clinical simulation takes place. This is significantly lower than a finding of a similar study done in Kuwait regarding the knowledge of health educators toward clinical simulation which showed that all participants were able to determine the simulator classification, fidelity and possible applications (Katoue, Iblagh, Somerville, & ker, 2015). This significant lower knowledge level in this study might be due to the unavailability of the equipment required to conduct clinical simulation and the economic level of the country.

This study also showed that 74(74.7%) of the respondent have a positive perception toward clinical simulation. It has also been found that educators working at private teaching institution significantly to have a positive perception toward clinical simulation compared to the ones working at a government teaching institution. But failed to show a statistically significant association with participants age, sex, educational qualification, and teaching experience. In contrary to this a similar study done in Egypt toward EBP found that educators have an increased positive attitude with advancing educational level, academic ranking, years of experience and teaching and researcher role.

In this study, almost all participant 95(94.9%) perceived that clinical simulation will improve a student's knowledge, critical thinking, and confidence. This finding is consistent with a study done in Pennsylvania, USA where students in the simulation group scored higher on the clinical decision-making skill compared to students in the case study groups. It is also in line with another study done among Omani students where students believe that clinical simulation enhances their knowledge and patient safety practice (Madhavanprabhakaran, Al-Khasawneh, & Wittmann, 2015; Powell-Laney, Keen, & Hall, 2012). This suggests that educators have a positive perception toward clinical simulation but lack the required knowledge, therefore, a way to improve the knowledge of these educators should be underscored by the responsible parties.

Almost half of the participant in this study disagree with the idea that there should be an age limit for an instructor to teach through clinical simulation. This finding is different compared to a finding reported by American Association of Colleges Nursing in which age of nursing faculty member being more than 50 years described as a cause of anxiety and apprehension toward technology associated with simulation (Kelly, 2014).

Only about half of the respondents in this study believe non-faculty nurses can conduct a clinical simulation session. In contrary to this a study done in USA to determine the effectiveness of non-faculty nurses in facilitating simulation exercises, most of the participant (94%) agreed non-faculty nurses are helpful and also most of the participant (92%) believe that they taught in a way suitable to the students (Foster, Sheriff, & Cheney, 2008).

This study reported that three-fourths of participant agreed that skills gained through clinical simulation can be transferred into the real clinical setting. This is in-line with a study done in Indiana, USA where faculty members reported that clinical simulation experience prepared students to perform in a real clinical setting (Feingold et al., 2004).

10. Conclusion

With the finding of this study, it is concluded that the majority of nurse educators were knowledgeable about clinical simulation in nursing education. Furthermore, most of the nurse educators were found to have a positive perception toward clinical simulation in nursing education. It was also found that knowledge of clinical simulation to be better among the one who had a bachelor's degree than those who had a master's degree. In addition, nurse educators working at private teaching institution were found to have a positive perception toward clinical simulation compared to the one working at the governmental institution. Lack of material was mentioned as the main challenge in the application of clinical simulation in nursing education.

Ethical considerations

Ethical approvals for the study was obtained from the Institutional Review Board (IRB) of the Department of Nursing and Midwifery, Addis Ababa University. For the data collection stage, a written Informed consent was provided to each participant, providing him/her with total autonomy towards participation or refusal. Confidentiality was assured by eliminating the need for providing a name in the questionnaires.

Conflict of interest

None.

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References

Alfes, C. M. (2011). Evaluating the use of simulation with beginning nursing students. *The Journal of Nursing Education, 50*(2), 89–93. https://doi.org/10.3928/01484834-20101230-03 [doi].

Debisette, A., Weiss, J., Burns, H. K., Cavanaugh, E. E., Cox, K., Drayton-Brooks, S., ... Gonzalez, C. M. (2010). *Addressing new challenges facing nursing education: Solutions for a transforming healthcare environment. National Advisory Council on Nurse Education and Practice. The National Advisory Council on Nurse Education and Practice (NACNEP)*.

Edgecombe Phillipa Seaton, K., Monahan, K., Meyer, S., LePage, S., & Erlam, G. (2013). *Clinical simulation in nursing: A literature review and guidelines for practice. AKO Aotearoa National Project Fund*.

Feingold, C. E., Calaluce, M., & Kallen, M. A. (2004). Computerized patient model and simulated clinical experiences: Evaluation with baccalaureate nursing students. *The Journal of Nursing Education, 43*(4), 156–163.

Foster, J. G., Sheriff, S., & Cheney, S. (2008). Using nonfaculty registered nurses to facilitate high-fidelity human patient simulation activities. *Nurse Educator, 33*(3), 137–141. https://doi.org/10.1097/01.NNE.0000312186.20895.50 [doi].

Hayden, J. K., Smiley, R. A., Alexander, M., Kardong-Edgren, S., & Jeffries, P. (2014). The NCSBN National Simulation Study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation, 5*.

Higher Education Relevance and Quality Agency, 2013. List of accredited Private Higher Education Institutions in Ethiopia. Higher Education Relevance and Quality Agency.

Hollema, C. (2015). Faculty development in high fidelity clinical simulation. *International Journal of Nursing Didactics, 5*, 1–5.

Hussein, A. H. M., & Hussein, R. G. (2014). Nursing educators' knowledge, skills in evidence-based practice and their critical thinking skills: Self report study. *Journal of Education and Practice, 5*, 86–95.

Katoue, M. G., Iblagh, N., Somerville, S., & Ker, J. (2015). Introducing simulation-based education to healthcare professionals: Exploring the challenge of integrating theory into educational practice. *Scottish Medical Journal,* 1–7.

Kelly, S. H. (2014). *Evaluation methods used in simulation: A survey of faculty and student perceptions in an undergraduate nursing program.* University of Pittsburgh Doctor of Education.

Lapkin, S., Levett-Jones, T., Bellchambers, H., & Fernandez, R. (2010). Effectiveness of patient simulation manikins in teaching clinical reasoning skills to undergraduate nursing students: A systematic review. *Clinical Simulation in Nursing, 6*(6), e207–e222. https://doi.org/10.1016/j.ecns.2010.05.005.

Madhavanprabhakaran, G., Al-Khasawneh, E., & Wittmann, L. (2015). Perceived benefits of pre-clinical simulation-based training on clinical learning outcomes among omani undergraduate nursing students. *Sultan Qaboos University Medical Journal, 15*(1), e105–11.

Melnyk, B. M., Fineout-Overholt, E., Gallagher-Ford, L., & Kaplan, L. (2012). The state of evidence-based practice in US nurses: Critical implications for nurse leaders and educators. *The Journal of Nursing Administration, 42*(9), 410–417. https://doi.org/10.1097/NNA.0b013e3182664e0a.

Nehring, W. M., & Lashley, F. R. (2009). Nursing simulation: A review of the past 40 years LK. *Simulation & Gaming TA – TT, 40*(4), 528–552.

Piscotty, R., Grobbel, C., & Tzeng, H. M. (2011). Integrating quality and safety competencies into undergraduate nursing using student-designed simulation. *The Journal of Nursing Education, 50*(8), 429–436. https://doi.org/10.3928/01484834-20110429-04 [doi].

Powell-Laney, S., Keen, C., & Hall, K. (2012). The use of human patient simulators to enhance clinical decision-making of nursing students. *Education for Health (Abingdon, England), 25*(1), 11–15 EducHealth_2012_25_1_11_99201 [pii].

Tseng, C. N., Hsieh, C. J., Chen, K. H., & Lou, M. F. (2013). Comparative study of an externship program versus a corporate-academic cooperation program for enhancing nursing competence of graduating students. *BMC Medical Education, 13*, 108–6920. https://doi.org/10.1186/1472-6920-13-108 [doi].

Tuttle, R. E. (2009). *The impact of simulation in nursing education on the self-efficacy and learner satisfaction of nursing students.* Capella University.

Wikipedia List of universities and colleges in Ethiopia 2015 [updated 3 December 2015] [Online]. Available: http://en.wikipedia.org/wiki/List_of_universities_and_colleges_in_Ethiopia.

Yigzaw, T., Ayalew, F., Kim, Y. M., Gelagay, M., Dejene, D., Gibson, H., & Stekelenburg, J. (2015). How well does pre-service education prepare midwives for practice: Competence assessment of midwifery students at the point of graduation in Ethiopia. *BMC Medical Education, 15*, 130–131 10.1186/s12909-015-0410-6 [doi].