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Designing, Implementing and Evaluating Preclinical Simulation Lab for Maternity Nursing Course

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Abstract

Background: The opportunity for students to deliver care safely in todays, complex health care environment is limited. Simulation allows students to practice skills in a safe environment. **Purpose**: to assess the students' perception, satisfaction, and learning outcomes after a simulation based maternity course. **Method:** a quasi experimental design was used. A total of 66 nursing students enrolled in the maternity course, academic year 2012 – 2013. Using a high fidelity simulation, procedure was developed to teach student basic maternity skills. The simulation sessions were conducted during the first 3 weeks of each semester. Two questionnaires were used. The first consisted of 4 parts (1) demographic data, , (2) likert scale to assess the student's satisfaction, (3) likert scale to assess the outcome, and (4) open ended questions to assess student's perception of simulation. The validity and reliability of the tools were ensured. The second was a likert scale to assess the students' perception of preclinical simulation sessions**. Results:** Participants expressed positive perception toward simulation sessions. They agreed that the objectives of the simulation were clear (m = 4.14, ± 0.59, and it was appropriate to their level (m = 4.09, ± 0.79. Students were satisfied with simulation sessions. They agreed that Simulation assisted in understanding how the clinical practice will be (m = 4.04, SD = 0.93) and it was helpful and effective (m = 3.88, ± 1.25). Strengths of simulation reported by students were grouped in four strengths: offered opportunity to practice activities that we are not allowed to practice in clinical sittings, learn from mistakes, enhanced critical-thinking, and immediate feedback. The weakness of simulation was grouped in two main categories: Simulation is not real and has limited human interaction. **Conclusion**: The results provided evidence that using simulation in maternity course before clinical placement was feasible and beneficial.
Key word: Simulation. Nursing education. Maternity

Introduction

The use of simulation has grown in nursing education, due to increased availability of the technology and to the benefits offered to students and teachers (Feingold, et al, 2004). Simulation offers increased control over learning (Ciofi, 2001). Simulation can provide a safe and controlled environment for nursing students to practice technical skills combined with the theoretical perspectives learned in the classroom setting (Feingold et al. 2004).

Simulation is an event or situation made to resemble clinical practice as closely as possible. Positive student responses to simulation have been documented and some studies have revealed improvement in certain aspects of student performance. In Nursing, simulation was used for teaching and evaluation (Alfes, 2011)

Simulation allows students to practice skills and apply nursing knowledge in a safe environment (Piscotty et al, 2011). In the simulated environment, simulations using human patient simulators are student-centered and provide students with opportunities to practice decision making, problem solving, and team member skills in a non-threatening way (Billings & Halstead, 2009). Human patient simulators are used to simulate direct patient care and allow learning in a low-stakes environment. Human patient simulators have been used successfully to train teams of licensed healthcare practitioners to deliver safer and more effective care; however, little is known about the use of simulation to train health professions' students in interprofessional healthcare teams.

The environment needs to be sufficiently realistic to allow for suspension of disbelief, so transition of knowledge from theory to practice can be stimulated (Billings & Halstead, 2009). According to Bearnson and Wiker (2005),

simulation is useful for teaching and valuating specific clinical skills and provides a way to increase safety, decrease errors, and improve clinical judgment.

According to Shepherd, et al, (2010) nurses of today must be critical thinkers, effective decision makers, and competent. Critical thinking is essential in nursing practice. Critical thinking, when applied to nursing, incorporates data collection and analysis, explores what is known in relation to the outcome, examines the individual patient and determines the best course of action (Shepherd et al., 2010). Clinical skills laboratories that incorporate simulation improve learners' skills in a safe, non-threatening experimental environment also provide opportunities for decision making, critical thinking and team building (Shepherd et al. 2010).

High-fidelity simulators are a unique learning tool increasingly used in health professions education. A human patient simulator is a mannequin interfaced with a computer program that can produce physiologic responses to student actions including changes in the mannequin's simulated heart rhythm, respiratory rate, pulse, and heart sounds (Schiavenato, 2009).

There is much established and emerging literature concerning use of high fidelity manikin simulation to teach a range of clinical skills to nursing students including emergency response (Fountain, et al, 2009) critical care (Parr & Sweeney 2006), maternity nursing (Yaeger et al. 2004), decision making (Lasater 2007) and cardio-pulmonary resuscitation (Long 2005) to name but a very few.
several advantages of using simulation in nursing education has been reported as it reduces training variability, increases standardization, guarantees experience for every students, can be customized for individualized learning, is student-centered learning. allows independent critical-thinking and decision-making, and delegation. allows Immediate feedback (Feingold et al. 2004).

It has been suggested that confidence may improve if simulation is used and that confidence gained during simulation is disseminated into clinical practice (Shepherd et al., 2010). HPS benefits students in the area of knowledge, value, realism, and learner satisfaction; however, findings have been mixed in terms of student confidence, transfer of knowledge, and stress reduction (Sportsman, et al, 2011).

The most common structure for a simulation-based course in nursing consists of an initial briefing followed by participation in the experience and then a debriefing (Cant & Cooper, 2009). This structure is similar to the recommendations provided by Lindsey and Berger (2009) who suggest three universal principles for experiential instruction – framing, activating, and reflecting on the experience. These principles are evident in the Jeffries/National League for Nursing Framework for Designing, Implementing and Evaluating Simulations (Jeffries & Rizzolo, 2006; Jeffries & Rogers, 2007).

Practice in simulated settings ("simulation") has been shown to be an effective mechanism for developing individual and team skills (Carlson, Min, & Bridges, 2009).Simulation activities can occur in a wide array of settings—e.g. in simulation centers, in situ, in virtual settings as in Second Life using varied techniques including immersive simulations, standardized patients, as well as single and
multiplayer "serious games." Regardless of location and format, simulation is increasingly being viewed as an enabling technology that transcends traditional educational boundaries and allows students in pre-licensure and post-graduate health care programs to acquire the competencies needed for interprofessional practice.

The college of nursing was established a very advanced maternity simulation lab with high low and feudality manikins to ensure standardization and enhance students' assessment and decision-making skills, increase retention of knowledge related to procedures, decrease patient risk, guarantee learning experience to each student and reduce students' stress. It was highly informative to design, introduce and evaluate a simulation based maternity course at the frist three weeks of a 16 weeks semester.

Purpose

The purpose of the current study was to assess the students' perception, satisfaction, and learning outcomes after having a simulation based maternity course designed and implemented to teach the basic maternity skills, and to compare the final marks between students started their clinical training using simulation and the student of the previous year who studied the same course without the attending simulation lab and were placed at the clinical sites at the beginning of the semester.

Method

A quasi experimental design (Nonequivalent control group posttest-only design) was used to conduct the current study. A total of 66 nursing female students enrolled in the maternity course for fall (n = 48) and spring (n = 18) semesters, Sixty four students completed the questionnaire. The participants were aware about the aim of the study and they were informed that the participation is voluntary. Verbal agreement (consent) was obtained from each subject before data collection. Subjects were informed that the data will be anonymous and confidential. The study was carried out in three phases. Phase I: designing Phase, Phase II: implementation Phase, and Phase III: evaluation Phase.

During the designing Phase, the Instructors received an extensive training by specialist on simulation to be able to effectively conduct the simulation session using the clinical sessions. The training period was about 2 weeks. It was mandatory for all course instructors to attend the training. Ten clinical Scenarios were developed by the instructors to cover antenatal, natal, and post natal care. Mosby maternity skills learning guide and check lists were adopted as learning resources to guide and assess student's practice.

Implementation Phase: The simulation sessions were conducted during the first 3 weeks of each semester (fall and spring) prior to the clinical placement. Using different levels of fidelity manikin simulation, procedure was developed to teach student the history taking, physical examination and care during antepartum, labor and delivery and postpartum. The first week was for teaching the students the antenatal nursing procedure including history taking, assessment, Leoplod's Manoeuvres uterine contraction, contraction Stress Test, external fetal monitor application, and fetal heart rate interpretation,. The second week was to teach the student labor and delivery care including: delivery room preparation perineal preparation, vaginal delivery, and fundal massage Third week ws to teach the postpartum skills such as post partum assessment and care, newborn assessment, apgar score, and gestational age assessment.

High feudality Advanced Childbirth Simulator was used. It is designed to provide a complete birthing experience before, during and after delivery. The birthing manikin touch screen vital signs and perinatal monitors provide students with feedback provided in real clinical settings. This Simulation is high in all fidelity types as it is situated in the maternity nursing skills laboratories, which is set up and fully equipped to simulate a 5 beds hospital ward.

The simulation lab ran over the course of 3 weeks (one day a week for each section) from 8 am to 4 pm including one hour break. Each section consisted of 8-10 students. Weekly plan was established at the beginning of the semester that both instructors and students were aware of.

The simulation begins with all students listening to patient's report. This report gives detail of patient diagnosis, reason for admission, length of stay, current condition etc. Students hold a short meeting to make a decision about work allocation. The student's practice was recorded and used for debriefing and evaluation. Debriefing was done every 40 minutes of practice for 20 minutes.

For Evaluation Phase, two questionnaires were used to collect data for the current study completed by the students at the end of their clinical rotations. The first questionnaire was developed by investigators and consisted of 4 parts which included: (1) demographic data, (2) student's satisfaction, (3) outcome, and (4) open ended questions to assess student's perception of weakness and strengths of simulation. Part 2 and three were It was five points likert scale, which ranged between 1 = strongly disagree, to, 5 =strongly agree.

The second questionnaire was developed by Jeffries (2005) to assess the students' perception of Preclinical Simulation Sessions. It was five points likert scale of 20 items in 5 main categories: Objectives and Information, Student Support, Problem Solving, Feedback/Guided Reflection, and Fidelity (Realism). The five points scale ranged between 1 = strongly disagree, to, 5 =strongly agree.
The content validity of the instruments was assessed by an expert who examined the tools and approved it. Test retest method was used to determine the reliability of the tool, by applying this tool twice on 2 subjects who were then excluded from the study. The reliability was 0.79. Students completed the evaluation tools at the end of the semester. They needed 20-25 minutes to complete the questionnaire.
Students; final grades were compared with the grades of the previous group of the students who took the course without using simulation lab and were placed at the clinical sites at the beginning of the semester.

Data Analysis: Data was coded for entry and analysis using SPSS statistical software package version 18. Data was presented using descriptive statistics in the form of frequencies and percentages. Interval and ratio variables were presented in the form of means and standard deviations. Independent t test was used to compare the students' grades. Pearson r used to test correlation between interval and ratio data. The significance level was chosen as ($p<0.05$).

Results

The purpose of this study was to investigate the students' perception, satisfaction, and learning outcomes after having a simulation based maternity course, and to compare the final marks between students who started their clinical practice by using simulation and the student of the previous year who studied the same course without the attending simulation lab and were placed at the clinical sites at the beginning of the semester. The mean age of the students was 22.48 $\pm$ 1.87 and the mean GPA was 3.31$\pm$ 0.54. On a rating scale from 0 to 10, to what extant simulation can replace clinical practice, the students mean was 5.31 $\pm$ 2.28.

Table 1: Frequency Distribution of Simulation Satisfaction Assessment by Students (n =64)

Statement	Disagree	Mutual	Agree	Mean	SD
The teaching methods used in this simulation were helpful and effective.	11 (17.2)	6 (9.8)	47 (73.4)	3.88	1.25
The simulation provided me with a variety of learning materials and activities to promote my learning the Maternity curriculum	9 (14.1)	7 (10.9)	48 (75)	3.83	1.16
The teaching materials used in this simulation were motivating and helped me to learn.	11 (17.2)	7 (10.9)	46 (71.9)	3.78	1.17
Simulation was suitable to the way I learn.	5 (7.8)	8 (12.5)	51 (79.7)	3.86	0.92
I am confident that this simulation covered critical content necessary for the mastery of Maternal Course.	6 (9.4)	8 (12.5)	50 (78.1)	3.81	0.83
I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting.	7 (10.9)	8 (12.5)	49 (76.6)	3.77	0.96
My instructors used helpful resources to teach the simulation.	9 (14.1)	7 (10.9)	48 (75)	3.81	1.153
It is my responsibility as the student to learn what I need to know from this simulation activity.	10 (15.6)	4 (6.2)	50 (78.1)	3.78	1.05
The simulations in the skills laboratory assisted me in my understanding How the clinical practice will be	5 (7.8)	6 (9.4)	53 (82.8)	4.02	0.93
Simulated clinical scenarios were fun, and interesting	8 (12.5)	5 (7.8)	51 (79.7)	3.91	1.00
The simulations helped me build on my skills	7 (10.9)	5 (7.8)	52 (81.2)	3.92	0.91
Helped decreasing my anxiety in the real clinical sittings	9 (14.1)	5 (7.8)	50 (78.1)	3.81	1.13
After simulation training I was more confidant to work with real situation	9 (14.1)	4 (6.2)	51 (79.7)	3.81	1.02
All activities offered helped me to develop conflict management skills.	4 (6.2)	2 (3.1)	58 (90.6)	4.03	0.81
Simulations Should be always precede the real practice	7 (10.9)	3 (4.7)	54 (84.4)	3.95	0.95
The simulated took less time to perform.	8 (12.5)	7 (10.9)	49 (76.6)	3.77	0.99
I would like to spend more clinical time working with simulation	9 (14.1)	5 (7.8)	50 (78.1)	3.89	1.08
Simulation allowed me for more hands on practice	7 (10.9)	5 (7.8)	52 (81.2)	3.86	0.97

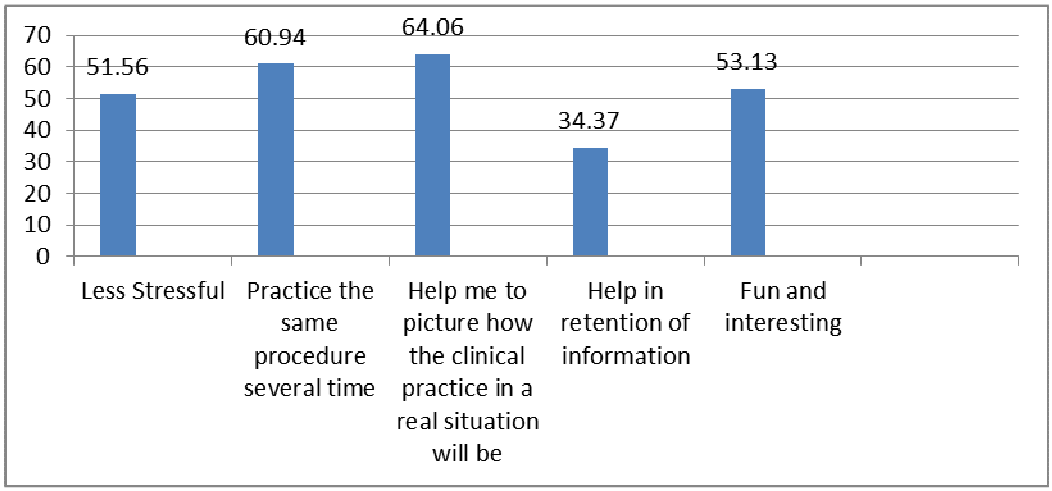
Table 1 showed that, assessing student's satisfaction showed that they were satisfied with simulation-based sessions. They agreed that Simulation assisted in understanding how the clinical practice will be (m = 4.04, SD = 0.93) Simulation was helpful and effective (m = 3.88, SD = 1.25). Participants also expressed that simulation was fun (m = 3.91, SD = 1.00), Helped building skill (m = 3.92, SD = 0.91). The majority of Participants agreed that Simulations should always precede the real clinical practice (m = 3.95, SD = 0.95).

Table 2: Frequency Distribution of Simulation Outcome Assessment by Students (n =64)

Students responses in relation to the skills					
Outcomes	**Disagree**	**Mutual**	**Agree**	**Mean**	**SD**
Critical thinking	8 (12.5)	4 (6.2)	52 (81.2)	3.77	0.94
Nursing process	9 (14.1)	8 (12.5)	47 (73.4)	3.77	1.05
Problem solving	7 (10.9)	4 (6.2)	53 (82.8)	3.87	0.81
Nursing procedure	10 (15.6)	4 (6.2)	50 (78.1)	3.94	1.14
Communication	9 (14.1)	8 (12.5)	47 (73.4)	3.67	1.025
Reporting and recording	9 (14.1)	3 (4.7)	52 (81.2)	3.73	0.95
Patient Teaching	11 (17.2)	4 (6.2)	49 (76.6)	3.70	1.17
Decision making	7 (10.9)	4 (6.2)	53 (82.8)	3.86	0.85
Team work	9 (14.1)	4 (6.2)	51 (79.7)	3.98	0.86

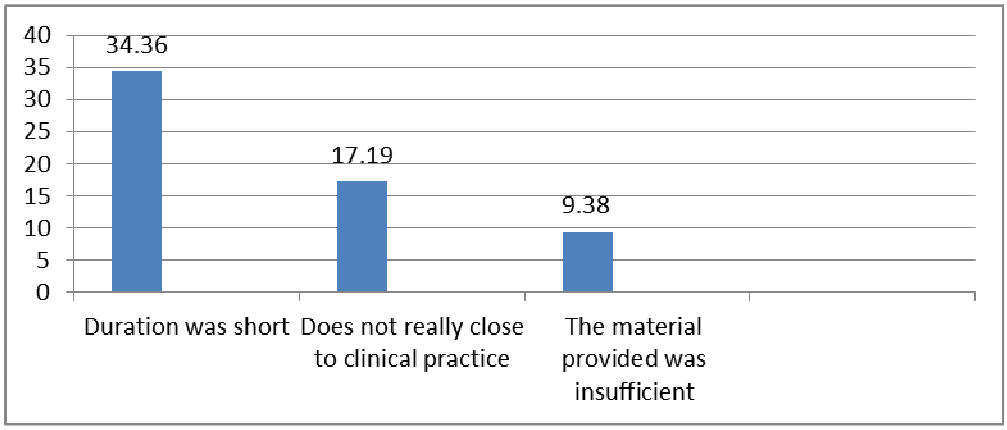
Table 2 showed that more than 80% of the students agreed that simulation improved their critical thinking skills. problem solving skills, reporting and recording skills, and decision making skills (81.2%, 82.8%, 81.2%, and 82.8% respectively), while less than three quarters of students agreed that simulation improved their ability to do nursing process, and communication skills.

Figure 1: Strengths of Simulation as Reported by the Students



In Figure 1 the students listed five main advantages of simulation. About two thirds of the students indicated that simulation helped them to picture how the clinical practice in a real situation will be and they can practice the same procedure several times (64.04% and 60.49% respectively). About half of the students indicated that simulation was less stressful and fun and intersecting (51.56% and 53.13% respectively). About only one third of the students indicted that simulation helped them to retain information (34.37)

Figure 2: Weakness of Simulation as Reported by the Students



The students in figure 2 listed three main disadvantages of simulation. About one third indicated that the duration was short. Seventeen percent indicated that simulation was not really close to clinical practice, and 9.38% indicated that the provided materials was not sufficient.

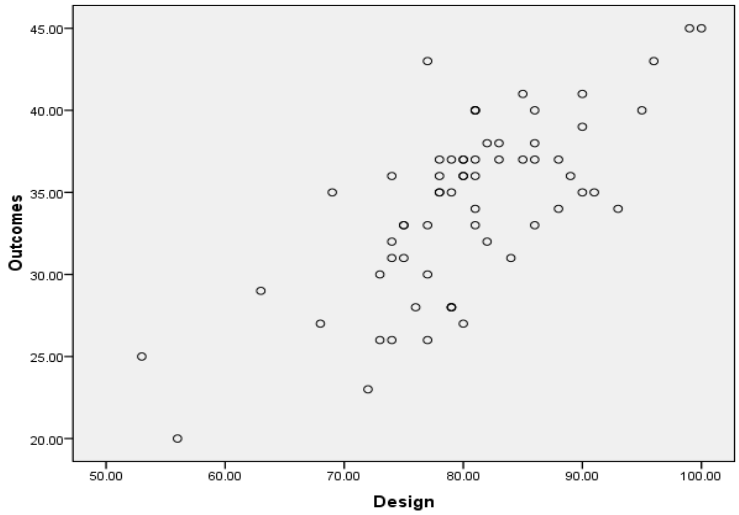
Table 3: Frequency Distribution of Students' Perception of Preclinical Simulation Sessions n = 64

Statement	Disagree	Mutual	Agree	Mean	SD
Objectives and Information					
There was enough information provided at the beginning of the simulation to provide direction and encouragement	4 (6.2)	1 (1.6)	69 (92.2)	4.08	0.70
I clearly understood the purpose and objectives of the simulation.	0	7 (10.9)	57 (89.1)	4.14	0.59
The simulation provided enough information in a clear manner for me to problem-solve the situation.	3 (4.7)	5 (7.8)	56 (87.5)	4.06	0.71
There was enough information provided to me during the simulation	1 (1.6)	5 (7.8)	58 (90.6)	4.05	0.55
The cues were appropriate and geared to promote my understanding	4 (6.2)	3 (4.7)	57 (89.1)	3.94	0.89
Student Support					
Support was offered in a timely manner.	4 (6.2)	2 (3.1)	58 (90.6)	3.97	0.71
My need for help was recognized.	4 (6.2)	6 (9.4)	54 (84.4)	3.95	0.79
I felt supported by the teacher's assistance during the simulation.	5 (7.8)	3 (4.7)	56 (87.5)	4.05	0.79
I was supported in the learning process.	4 (6.2)	6 (9.4)	54 (84.4)	4.00	0.82
Problem Solving					
Independent problem solving was facilitated.	2 (3.1)	5 (7.8)	57 (89.1)	4.00	0.67
I was encouraged to explore all possibilities of the simulation.	2 (3.1)	6 (9.4)	56 (87.5)	3.98	0.60
The simulation was designed for my specific level of knowledge and skills.	3 (4.7)	5 (7.8)	56 (87.5)	4.09	0.79
The simulation allowed me the opportunity to prioritize nursing assessments and care.	3 (4.7)	8 (12.5)	53 (82.8)	3.97	0.78
The simulation provided me an opportunity to goal set for my patient	2 (3.1)	7 (10.9)	55 (85.9)	3.98	0.63
Feedback/Guided Reflection					
Feedback provided was constructive.	4 (6.2)	6 (9.4)	54 (84.4)	4.03	0.75
Feedback was provided in a timely manner.	3 (4.7)	5 (7.8)	56 (87.5)	4.08	0.69
The simulation allowed me to analyze my own behavior and actions.	5 (7.8)	3 (4.7)	56 (87.5)	4.06	0.86
There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order	3 (4.7)	5 (7.8)	56 (87.5)	4.06	0.85
Fidelity (Realism)					
The scenario resembled a real-life situation.	8 (12.5)	8 (12.5)	48 (75)	3.46	0.81
Real-life factors, situations, and variables were built into the simulation scenario.	13(20.3)	7 (10.9)	44 (68.8)	3.38	1.00

Table 3 showed frequency distribution of students' perception of preclinical simulation**.** Participants expressed positive perception toward the simulation-based sessions. Regarding objective and information 92.2% of the students agreed that there was enough information provided at the beginning of simulation (M = 4.08, SD = 0.7o), While 4.7 % disagree that simulation provided information to problem-solve the situation. For student

support 90.6% of the student agreed that support was offered in timely manner (m= 3.97, SD = 0.71.). In the problem solving part 89.1% agreed that Independent problem solving was facilitated (m = 4.0, SD = 0.67) and 87.5% agreed that simulation was appropriate to their level and skill (m = 4.09, SD = 0.79). Regarding Feedback and guided reflection 87.5 % of the students agreed that feedback was provided, Simulation allowed for analysis of behavior and action, and they obtain guidance/feedback from the teacher. Both Fidelity and realism items got the lease percentage of agreement by the students only 75% of the students agreed that the scenario resembled a real-life situation and about one fifth of the students disagreed that Real-life factors, situations, and variables were built into the simulation scenario.

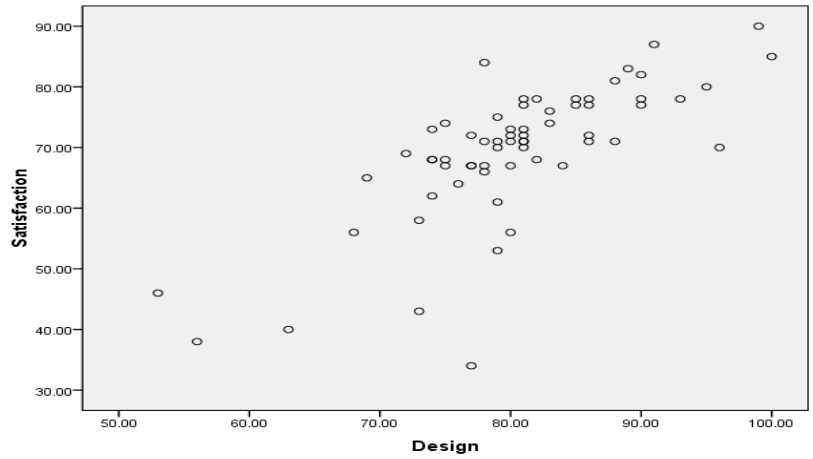
Figure 3: Relationship between Total perception Score and Total Outcome Score



.709 **P = 0.000**

Fighure 3 showed that there was a positive correlation between the total score of perception and the total outcome score of (p= 0.000, r = 0.709). This indicated that students with higher perception total score had a better total outcome score.

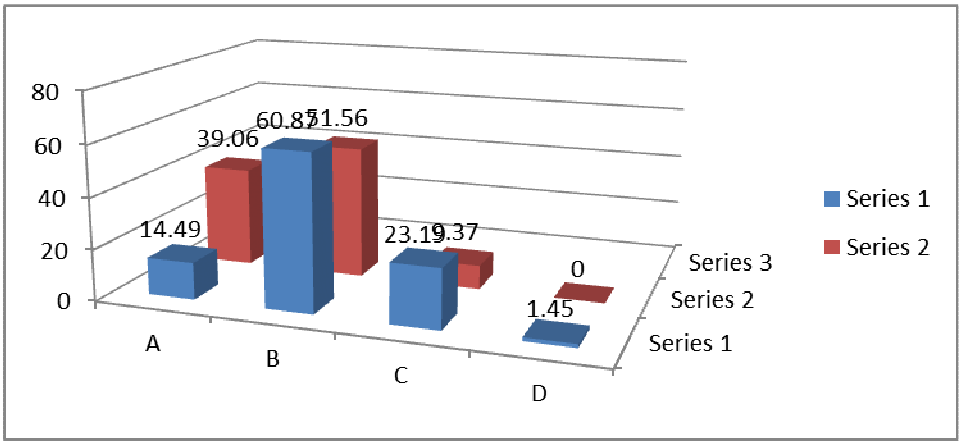
Figure 4: Relationship between Total Perception Score and Total Satisfaction Score



r = 0.740 **P = 0.000**

In figure 4 also there was a positive correlation between the total score of perception and the total score of satisfaction (p = 0.000, r = 0.740). This indicated that students with higher perception total score had a better satisfaction total score.

Figure 5: Comparison between Students Taught by Simulation and those who did not



P=0.000

Figure 4 showed the comparison between students taught by simulation and those who did not. There was a statistically significant difference of the final grades between students taught by simulation and students who did not. Students taught by simulation had higher course total score. The mean total score of the students who taught by simulation was 87.79 which is equivalent to B+ while the mean total score of the students who did not taught by simulation was 83.07 which is equivalent to B-.

Discussion

Simulation has been used in health care for both formal and clinical education and that it offers a realistic hands-on medium for acquiring basic skills It is well known that well designed simulation activities engage learners in situated professional knowledge-building (Jeffries 2007). The results of student assessment of the design, outcome and satisfaction provided evidence that using simulation in maternity course before clinical placement of the students was feasible and beneficial. Students agreed that Simulation assisted in understanding how the clinical practice will be (m = 4.04, SD = 0.93) Simulation was helpful and effective (m = 3.88, SD = 1.25). Participants also expressed that simulation was fun (m = 3.91, SD = 1.00), Helped building skill (m = 3.92, SD = 0.91).

A similar study was done by Wilson showed that nursing students expressed positive attitudes toward the simulation-based course. They agreed that the simulation was motivating (M = 4.50, SD = 0.58) and effective (M = 4.41, SD = 0.64). Participants also expressed satisfaction toward the resources used during the simulation (M = 4.00, SD = 0.69). They were confident in their mastery of skills and knowledge covered in the simulation (M = 4.31, SD = 0.79) and in their ability to apply this content to clinical settings (M = 4.15, SD = 0.54). They also felt it was their own responsibility to determine what was to be learned from the simulation (M = 4.46, SD = 0.58).(Wilson, 2012)
These findings are similar to those of other studies regarding the use of simulation in pharmacy education. Seybert and colleagues found that pharmacy students' satisfaction, knowledge, and confidence increased after participation in a human patient simulation exercise in a pharmacotherapy course (Seybert, et al. 2006)

The perception that there was a possibility of encountering similar patient situations in actual nursing practice was motivating to students. The students' response to an open ended question about the advantages of simulation indicated that simulation helped them to picture the clinical practice in a real situation and they can practice the same procedure several times (64.04% and 60.49% respectively). Students indicated that simulation was less stressful and fun (51.56% and 53.13% respectively).

Consistent with the call for changes in nursing education as described by Hauber et al. (2010), Piscotty et al. (2011) identified that the community-at-large is demanding that improved quality and safety in clinical care be addressed at the baccalaureate level of nursing education

As response to an open ended question about the disadvantages of simulation students mentioned three main disadvantages which are duration was short. Simulation was not really close to clinical practice, and the provided materials was not sufficient.

In the current study, implementing preclinical simulation lab for maternity nursing course was viewed as a positive learning experience by the majority of students involved. There was a significant improvement in the course overall grades which included clinical practice grades, course assignments and exams
Alinier et al. (2006) study results support the use of simulation in nursing education. Simulation should be used appropriately and as an educational tool that enhances quality of learning. High-fidelity simulation allows students to gain a minimal knowledge base of technical and non-technical skills prior to using the skills in an actual practice setting.

Grady et al. (2008) evaluated whether basic nursing procedure training in high fidelity versus low-fidelity mannequins results in differential skill acquisition and perceptions of simulator utility. Grady et al. formulated two hypotheses. The first hypothesis tested whether training with a reactive simulator would provide a better experience than a static simulation experience. Student performance on naso-gastric tube insertion and indwelling urinary catheter insertion in addition to the students' self-reported attitudes towards the difference in mannequin fidelity was used to compare the two. The second hypothesis tested was whether gender influenced simulation-based training. There was no clear framework listed for this study.

Students in this study reported that simulation helped to improve their critical thinking, using nursing process, problem solving, Nursing procedure, Communication, Reporting and recording, Patient Teaching, Decision making, and Team work

There were areas that could be strengthened such as assessing the satisfaction and perception of the faculty members. Data collected was attitudinal and self-reported by students. Further research regarding team performance and associated clinical outcomes, including quantitative measures, should be collected. because the simulated maternity experience was part of a required course, there was no control group used in the study design

The use of high fidelity manikin simulation is only one way of using simulation in nurse education. Simulations which are high in environmental, equipment and psychological fidelity can also provide an excellent learning opportunity for student nurses. Student engagement with this simulation and their feedback suggests that skills obtained during the simulation are transferable into and valuable for their clinical placements. The results of student assessment of the design, outcome and satisfaction provided evidence that using simulation in maternity course before clinical placement of the students was feasible and beneficial. The study provided evidence for future implications of simulation lab in Maternity course

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