Evaluation of Utilization of Simulation as a Teaching and Learning Strategy at Kenya Medical Training College, Nairobi

Purity Nyamu[1], Prof. Ruth Gatere (PhD)[2], Winfred K. Kithinji[3]

[1]Kenya Methodist University
[2]Associate Professor, Kenya Methodist University
[3]Kenya Methodist University

ABSTRACT

Simulation is a teaching and learning strategy that is used in nursing education for preparation of students into clinical practice. The use of simulation as an educational tool is endorsed in the nursing curricular. In general, the literature supports the use of simulation to benefit nursing student in areas of knowledge, value and realism. However, little emphasis has been placed to make effective use of the method. The aim of the study was to assess the perceptions of nursing students and tutors on utilization of simulation as a teaching and learning strategy at KMTC-Nairobi with view of improving the utilization of the simulation strategy. This study utilized descriptive cross sectional research design. The target population comprised of all nursing students and the tutors at KMTC-Nairobi. The study employed the stratified sampling technique to identify the nursing student respondents. For the tutors, census approach was applied where all the teachers were studied. Data collection tools were structured questionnaires which were used for data collection to obtain information from the respondents. Quantitative data analysis was conducted using the Statistical Package for Social Science (SPSS) software version 24 for windows. Both descriptive and inferential statistics particularly the T test statistics were used in data analysis. The findings obtained showed that a number of simulation experiences such as full-body mannequins or integrated simulators, partial task trainers and computerized simulators have been incorporated in the nursing program at KMTC. The study also found out that both the nurse students and the nurse tutors had a positive perception towards the utilization of simulation in teaching and learning. The study further found out that simulation models at KMTC were yet to be fully efficient in achieving their objectives. The coefficient of determination R square obtained indicated that 29% of simulation as a teaching and learning strategy is explained by perception on simulation, simulation models usage and perception of effectiveness of simulation of nursing students. From the model obtained, simulation application had a coefficient of 0.469 which implies a positive effect on simulation as a teaching and learning strategy. The relationship was significant at 95% since the p-values are less than 0.05.The study therefore concludes that KMTC is yet to fully and successfully integrate the simulation practices in their programs. The study recommends that the management to highly prioritize this during strategy formulations and budgetary allocation. They should also redesign the curricula, train the nurse tutors and sensitize the nurse students on the importance of the adoption of simulation methods. The study further recommends that the Ministry of Health to develop and equip simulation laboratories across country, and not only KMTC only.

Key Words: *Utilization of Simulation, Teaching and Learning, Nursing Education, Kenya Medical Training College, Nairobi*

1. INTRODUCTION

Simulation is a teaching and learning strategy that is used in nursing education for preparation of nursing students into clinical practice. Simulations are "activities that mimic reality of a clinical environment and are designed to demonstrate procedures, decision-making and critical thinking through techniques such as role playing and the use of devices such as interactive videos or mannequins" (Jeffries, 2005). Webster, (2003) states that to simulate is "to look or act like." The first healthcare simulation manikins used for simulation were introduced in 1962 (Jeffries, 2007).In the health care field, simulation was mostly used in medical education, for emergency room training, anesthesia crisis management, residents in trauma rotations, and first responders for cardiac care (Seropian, Brown, Gavilanes, & Driggers, 2004). In nursing education, simulation has existed in many forms and has been used teaching and learning various skills, for instance clinical decision making, critical care, and cardiopulmonary resuscitation. The different forms of simulations are fidelity and context (Gaberson & Oermann, (2010). Fidelity is the degree to which the simulation depicts the real situation, and varies from high to low (Jeffries, 2005; Rothgeb, 2008).Context is the extent of circumstance produced by simulation, and also varies from full to partial. According to Nagle et al, (2009) each approach is usually associated with the teaching and learning of a specific skill type that maximizes its potential as an educational tool. Gaberson & Oermann, (2010) states that with increasing numbers of nursing students and decreasing numbers available clinical sites and nursing faculty, the use of simulation has become an integral part of nursing education.

Simulation provides an opportunity for students to practice clinical situations such as patient monitoring, management, communication, and multidisciplinary collaboration. According to Hertel & Millis (2002), simulation allows nursing students to take patient's specific history and translate it into a real life scenario. The aim of simulation in clinical setting is to improve patient safety and to help the student nurse achieve competence, linking their theoretical knowledge with clinical practice (Ricketts, 2011). Jeffries and Rogers (2012) developed the Nursing Education Simulation Framework, which describes teacher and student characteristics combined with educational practices that affect student outcomes and simulation design characteristics. Internationally, simulation has been endorsed by nursing professional bodies such as National League for Nursing in the United States and Nursing & Midwifery Council in the United Kingdom (Nursing and Midwifery Council, 2015). The Nursing Council of New Zealand has made it a requirement that, all students have access to simulation learning resources in order to prepare them appropriately for clinical experiences to ensure the safety of health consumers, students and staff (NCNZ, 2010). Gaberson & Oermann (2010) affirm that simulation is an excellent teaching strategy for many skills in various nursing departments, as it is coupled by benefits like enhanced learning in a risk-free environment, practice of skills, and immediate faculty or tutor feedback. In the Lesotho, teaching and learning through simulation in nursing education has been used to prepare nursing students for clinical practice. Simulation has been implemented, to assist nurses in learning and practice these essential clinical skills. The Ministry of Health developed and equipped simulation laboratories across Lesotho and redesigned curricula, trained faculty in clinical simulation scenarios and student debriefing methods, and developed a plan for sustaining simulation-based education. The MOH Lesotho further, developed and implemented monitoring tools, provided mentoring and

13

supported continued faculty education research in clinical simulation. Through the Nursing Education Partnership Initiative simulation laboratories at nursing schools in Lesotho, Zambia, Malawi, and Ethiopia were also developed (ICAP, 2014).

Livingston Patricia *et al*. (2014) in their article Development of a simulation and skills centre in East Africa, found out that Rwanda is another country that recognized the benefits of simulation-based education in healthcare, a centre for simulation was established to address the challenge of shortage of clinical teachers. In Kenya there are a few nursing schools that have developed simulation centres for students training. For instance, Kijabe Hospital through the Improving Perioperative and Anesthesia Care Training in Africa developed simulation centre to enhance training of nurse anesthetist through simulation. Capacity Kenya, supported Kenya Medical Training College Kitui to upgrade the skills laboratory by setting up teaching tools such as training simulators, mannequins, and other humanistic models to improve instructional methods and build skills for students in Family Planning/Reproductive Health (Kimeu & Oyucho, 2012). The Nursing Council of Kenya recommends tutor to student ratios for nursing education and clinical placements. For classroom instruction, the NCK recommends a ratio of 1 tutor to 10 students (Nursing Council of Kenya, 2012). While the NCK recommends 1 tutor to 10 students for classroom instruction, the actual ratios vary across nurse training institutions. At the Kenya Medical Training Colleges (KMTCs), the tutor to student ratios vary from a low of 1 tutor to 6 students to a high of 1 tutor to 50 students, while the average is 1 tutor to 22 students, demonstrating the need for additional nursing faculty in many of the institutions. To illustrate nursing schools are faced with limited facilities, Appiagyei *et al*. (2014) in their study on factors affecting pre-service training capacity and production in Kenya, identified new student nurse enrolment doubled between 1999 and 2010. The findings indicated institutions were strained by the increased numbers in terms of having adequate faculty capacity, clinical sites and mentorship, and student housing and classroom space. To address the issue of congestion during students' clinical experience, the study recommended training institutions should consider the increased use of skills laboratory that simulates the clinical practice environment with patient models. Despite achievements in training through use of simulation, there is need to evaluate utilization of simulation as a teaching and learning strategy.

2. STATEMENT OF THE PROBLEM

Nursing education has been faced with numerous challenges and more precisely in the area of clinical instruction. These challenges have been identified as shortage in lack of qualified faculty, a shortage of clinical sites at which students can learn nursing care and also increased number of students who need supervision in clinical setting (Deloitte, 2015). The faculty shortage is not only affecting classroom instruction, but also affecting the ability of schools of nursing to provide quality clinical experiences. In Kenya, the Nursing Council of Kenya (2012) expects students to perform in the clinical setting in order to practice the nursing skills they have learned in the classroom and to learn how to provide total patient care to real patients. In order to perform in the clinical setting, they have to be overseen by clinical faculty.

Unfortunately, at KMTC, as detailed in the KMTC (2013) audit report, there are not enough clinical faculty members to provide clinical instruction to the high numbers of nursing

students. In addition, each specialty area of nursing requires nurse educators who are specialized in each area to oversee the clinical experiences. Emphasis is now put to increase use of skills laboratory that simulates the clinical practice environment with patient models minimizing the above mentioned challenges. Despite the usefulness and the benefits coupled in simulation use, the college has been criticized by the Auditor General of being under-utilized (Business Daily, 2015). Against this backdrop, the present study sought out to assess the perceptions of nursing students and tutors on utilization of simulation as a teaching and learning strategy at KMTC-Nairobi with view of improving the utilization of the simulation strategy.

3. PURPOSE OF THE STUDY

The aim of the study was to assess the perceptions of nursing students and tutors on utilization of simulation as a teaching and learning strategy at KMTC-Nairobi with view of improving the utilization of the strategy.

4. OBJECTIVES OF THE STUDY

   i.   To assess perceptions of nursing students on utilization of simulation as a learning strategy at KMTC-Nairobi.
  ii.   To assess perceptions of tutors on utilization of simulation as a teaching strategy at KMTC-Nairobi.
 iii.   To identify the extent of usage of simulation models for teaching by tutors at KMTC-Nairobi.
  iv.   To assess perceptions of nursing students on the effectiveness of simulation as a learning strategy at KMTC-Nairobi.

5. THEORETICAL FRAMEWORK

The theoretical framework for this study will be Experiential Learning (Kolb, 1984). Kolb's Experiential Learning Theory (Kolb, 1984) defines experiential learning as "the process whereby knowledge is created through the transformation of experience." Kolb's model includes a four-phase cycle of learning consisting of concrete experience, reflective observation, abstract conceptualization, and active experimentation as per Figure 1. The rationale for the use of experiential model is based on the purpose for the teaching or learning experience. Simulation is an ideal method to incorporate experiential learning into nursing education. Experiential learning is an experience of learning through practice. The "experience" is the student nurse practicing the skills learned and applying the knowledge that they have gained in the classroom to the simulation laboratory on a patient simulator. The "reflection" aspect is the debriefing session that occurs after the simulation. The students, peers, and academic instructors reflect on what occurred during the simulation. As a group they can identify strengths and weaknesses and determine how they can improve their patient care and apply their knowledge to different patient situations. The learner may begin at any stage but subsequently must follow the sequence: concrete experience, the doing phase; reflective observation, the observation phase; abstract conceptualization, the thinking phase; and active experimentation, the planning phase (Hartley, 2010).
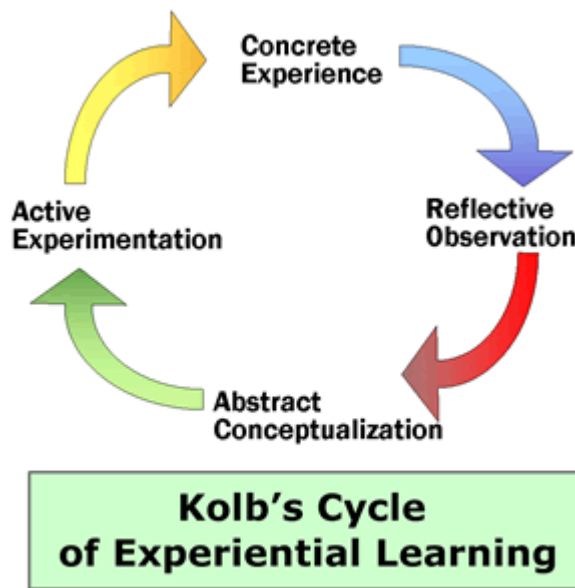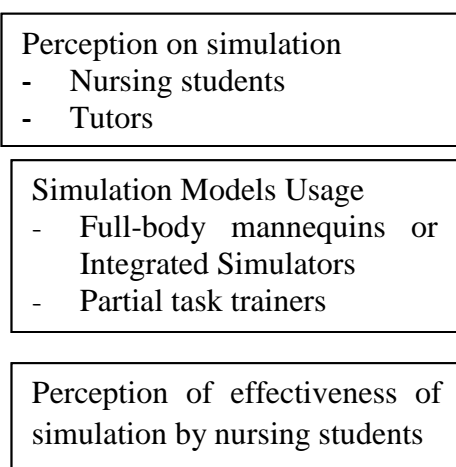
image by Karin Kirk

Figure 1: Kolb's Cycle of Experiential Learning

Concrete Experience refers to one getting experience through exposure to a real situation. This stage is considered the "feelings" stage and for the purposes of this study, the concrete experience is the classroom lecture where the students will gain didactic knowledge from experts. Reflective Observation refers to one's ability to reflect and observe his own experiences from different perspectives. Abstract Conceptualization is achieved through integrating one's observations with his previous experience, a new concept is created. The students will be able to think through case studies and actively participate with classroom questions to think about and apply their knowledge. Simulation allows the students to practice in an environment where the simulated patient care experience enables them to use knowledge gained from the traditional classroom lecture and apply it to a patient scenario in a safe environment (Hall, 2013).

6. CONCEPTUAL FRAMEWORK

Independent Variables   **Dependent Variable**

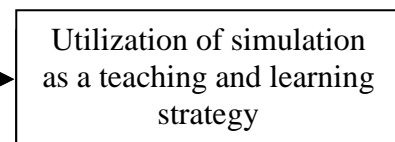| Perception on simulation - Nursing students - Tutors	
Simulation Models Usage - Full-body mannequins or Integrated Simulators - Partial task trainers	Utilization of simulation as a teaching and learning strategy
Perception of effectiveness of simulation by nursing students	

Figure 2.2 Conceptual Framework

7. RESEARCH METHODOLOGY

The study used descriptive cross-sectional research design. This design was best suited for the study since it used information obtained as at particular time. The design was considered appropriate in achieving the study objectives. This study was conducted at the Kenya Medical Training College, Nairobi campus. Nairobi County hosts the capital and largest city in Kenya. Nairobi County is Located in Nairobi Province, it borders the following counties Kiambu County to the North, Machakos County to the East and Kajiado County to the South. The KMTC-Nairobi campus is situated about three kilometers on the northern side of Nairobi city, Kenya. It is the KMTC headquarters and the main campus. The campus stands on a 20-acre piece of land, opposite the largest referral hospital in the east African region, Kenyatta National Hospital, along Old Mbagathi Road. The campus neighbors many colleges and universities in Nairobi County. KMTC Nairobi campus offers wide range of courses ranging from certificate, diploma to higher diploma. Currently, around 37 courses are offered at KMTC Nairobi campus. KMTC has 56 constituent colleges of the expansive institution offering 50 courses.

The target population comprised of all nursing students and the tutors at KMTC-Nairobi. There are about 400 nursing students and 30 nurse tutors. The researcher choose KMTC Nairobi since it is the main campus and headquarters for KMTC. The campus also offers the wide range of courses than all campuses and is expected to have the most advanced teaching methods. Further, since the Nairobi is the main campus, it is expected that any new teaching techniques would be applied in Nairobi before being implemented to other campuses. This makes the campus best suited for this study. The study used nursing students in session for clinical practice at Kenyatta National Hospital and in for blocks as well as all the tutors who agreed to participate in the study. Stratified random simple sampling was applied for the nursing students. The 400 nursing student population was stratified by year of study. The number of respondents per year was determined by the weight of the class to the total population. After stratifying the population, simple random sampling was used to identify the respondents. The total population of the tutors was 30 and was considered to be a small number hence the justification to take the whole population as the sample.

The researcher used two data collection assistants. The assistants had minimum qualification of diploma or certificate in nursing. The research assistants underwent a three day training on how to identify the respondents, how to approach them, courtesy when engaging the respondents, communication and how to administer the questionnaires. The research assistants administered the first twenty questionnaire with the researcher so as to ensure professional administration of the questionnaires. The research assistants directly delivered the questionnaires to the respondents at KMTC Nairobi for nursing students and tutors. The respondents were informed verbally and in writing about the study. Those who consented to fill the questionnaire were provided with questionnaire to fill, and on completing the questionnaire they collected and sealed in an envelope. The questionnaires were collected upon completion daily by the research assistants at designated areas for analysis. Daily review of the questionnaires filed and collected was done by the researcher. Raw data entries were reviewed for data entry errors and corrected prior to analyzing data to ensure accuracy and consistency. Data was all coded and entered into a database and quantitative data

analysis was conducted using the Statistical Package for Social Science (SPSS) software version 24 for windows. Both descriptive and inferential statistics were used in data analysis. Whereas descriptive statistics included frequencies, percentages, means, and standard deviations, inferential statistics included the T test. Quantitative data were presented in tables, graphs, and charts. Responses to qualitative data were thematically analyzed.

8. RESULTS AND DISCUSSION

The study sought at obtaining the nurse students perception on the use of simulations as a learning strategy. The respondents were required to rate their responses whereby, SA=strongly Agree, A= Agree, N=Neutral, D= Disagree or SD= strongly disagree. The results are shown by Table 1.

Table 1: Nursing student perception on simulation as a learning strategy

Perception	SA(%)	A(%)	N(%)	D(%)	SD(%)	M	SD
The laboratory skills adequately prepared before simulation	26.8	51.7	16.1	4	1.3	2.01	0.846
The skills laboratory can accommodate students during simulation.	21.2	44.4	20.5	7.9	6	2.33	1.081
Enough time allocation for simulation	18.9	42	19.6	16.1	3.5	2.43	1.078
Satisfactory number of students are assigned to each simulation session.	24.1	37.9	20.7	13.8	3.4	2.34	1.095
Return demonstration is achieved by every student	26	38.7	16	15.3	4	2.33	1.138
Instructors/tutors offer support during simulation sessions.	36.2	47.7	12.1	3.4	0.7	1.85	0.811
Participating in simulation enhances confidence and satisfaction.	51.3	36	10	2	0.7	1.65	0.795
Simulation enables meeting learning outcomes	49.7	41.1	9.3	0	0	1.6	0.655

As shown, the respondents (51%) strongly agreed on participation in simulation enhancing confidence and satisfaction with a mean of 1.65 and standard deviation of 0.795. On Simulation enables meeting learning outcomes, 50% of the respondents agreed with a mean of 1.65 and standard deviation of 0.655. The respondents (52%) also agreed on laboratory skills being adequately prepared before simulation with a mean of 2.01 and standard deviation of 0.846. On instructors/tutors offer support during simulation sessions 48% agreed with a mean of 1.85 and standard deviation of 0.811. On the skills laboratory can accommodate students during simulation, 44% of the respondents agreed with a mean of 2.33 and standard deviation of 1.081.

On there being enough time allocation for simulation, 42% agreed with a mean of 2.43 and standard deviation of 1.078. On return demonstration being achieved by every student, 38% agreed while 24% strongly agreed having a mean of 2.34 and standard deviation of 1.0965. While on satisfactory number of students are assigned to each simulation session the respondents were mostly undecided with 21% being neutral, 24% strongly agreed and 38% agreeing with a mean of 2.34 and standard deviation of 1.095. This implies that, based on the findings, the nurse students had a positive perception on simulation being used as a learning strategy as they agree with most of the statements.

The study further sough to determine the nurse students' perception on the benefit of simulation. The respondents were required to rate their responses whereby, SA=strongly Agree, A= Agree, N=Neutral, D= Disagree or SD= strongly disagree

Table 2: Perception on simulation benefit

Perception on simulation benefit	SA(%)	A(%)	N(%)	D(%)	SD(%)	M	SD
Simulation promotes communication skills	42.7	49.3	6.7	1.3	0	1.67	0.662
Simulation promotes safe practice	48.6	39.2	11.5	0.7	0	1.64	0.71
Debriefing and feedback from tutors is beneficial	39	44.5	12.3	4.1	0	1.82	0.805
Simulation reduce anxiety and fear to practice.	56	34	10	0	0	1.54	0.672
Relevant questions are addressed	47.1	42.1	8.6	1.4	0.7	1.66	0.755
Beneficial Knowledge is gained	41.8	51.4	6.8	0	0	1.65	0.606
Skill performance is enhanced	54.5	39.9	4.2	1.4	0	1.52	0.648
Simulation promotes Critical-thinking	41	45.8	10.4	2.8	0	1.75	0.753
There is learner satisfaction	44.4	39.6	13.2	1.4	1.4	1.76	0.838

As shown in Table 2, the majority (55%) of respondents strongly agreed on Skill performance being enhanced by simulation with a mean of 1.52 and standard deviation of 0.648. Most of the respondents (56%) also strongly agreed on simulation reduce anxiety and fear to practice with a mean of 1.54 and standard deviation of 0.672. On whether beneficial knowledge is gained, 42% strongly agreed while 51% agreed having a mean of 1.65 and standard deviation of 0.606. On whether simulation promotes critical thinking, 41% strongly agreed while 46% agreed with a mean of 1.75 and standard deviation of 0.753. As pertaining

19

to simulation enhancing learner satisfaction, 44% strongly agreed while 40% agreed having a mean of 1.76 and standard deviation of 0.838. Forty seven (47%) strongly agreed while 42% agreed that relevant questions are addressed, with a mean of 1.66 and standard deviation of 0.755. The respondents were affirmative on simulation promotes safe practice with 49% strongly agreeing and 39% agreeing having a mean of 1.64 and standard deviation of 0.71. The respondents also agreed on simulation promotes communication skills (49%) with a mean of 1.67 and standard deviation of 0.71. Debriefing and feedback from tutors was also agreed to be beneficial (45%) having a mean of 1.82 and standard deviation of 0.805.

The study sought to investigate the exact type of simulation models applied in teaching by the tutors at KMTC and their extent of use.

Table 3 Simulation Models Applied in Teaching by Tutors

Simulation Models	VLE(%)	LE(%)	ME(%)	SE(%)	Mean	SD
Full-body mannequins or Integrated Simulators	23.1(34)	46.2(70)	30.8(47)	0	2.08	0.76
Partial task trainers	23.1(34)	46.2(70)	23.1(34)	7.7(13)	3.15	0.90
Computerized simulators	0	23.1(34)	30.8(47)	46.2(70)	4.23	0.83

As shown in Table 3, Full-body mannequins or Integrated Simulators was adopted to a large and very large extent (69%), having a mean of 2.08 and standard deviation of 0.76. Partial task trainers was also applied to a large extent and very large extent (69%) with a mean of 3.15 and standard deviation of 0.90. While computerized simulators had a small extent of adoption (46%) with mean of 4.23 and standard deviation of 0.83. This implies that the most used simulation model was Full-body mannequins or Integrated Simulators while the least was computerized simulators. The study further sought to determine other simulation models applied in teaching by the tutors, other than those asked in the questionnaires.

The study aimed to establish the nursing tutor's perceptions on simulation models. The results obtained are shown by Table 4.

Table 4 Nursing Tutors Perceptions on Simulation Models

Perceptions on Simulation Models	SA (%)	A(%)	N(%)	D(%)	SD	Mean	SD
Additional trainings on simulation	15.4	15.4	38.5	23.1	7.7	2.92	1.19
High fidelity simulations in demonstrations	25	25	41.7	0	8.3	2.42	1.16
Adequate preparation and executing simulation time	7.7	53.8	23.1	15.4	0	2.46	0.88
Manageable ratio of lecturer to student during simulation	7.7	30.8	15.4	38.5	7.7	3.08	1.19
Adequate spacing in the skill laboratory.	15.4	15.4	38.5	23.1	7.7	2.92	1.19
Any additional practice hours are scheduled	15.4	23.1	23.1	15.4	23.1	3.08	1.44

Perceptions on Simulation Models	SA (%)	A(%)	N(%)	D(%)	SD	Mean	SD
Simulation enables students to meet their learning outcome.	84.6	7.7	7.7	0	0	1.23	0.60
Simulation is utilized in teaching all courses	23.1	23.1	38.5	15.4	0	2.46	1.05

The findings show that majority of the respondents (85%) strongly agreed on simulation enables students to meet their learning outcome with a mean of 1.23 and standard deviation of 1.23. The respondents also agreed on there being adequate preparation and executing simulation time (54%) with a mean of 2.46 and standard deviation of 0.88. The respondents were however neutral on high fidelity simulations in actual representation of the clinical setting (42%) having a mean of 2.42 and standard deviation of 1.16. On whether the simulations enabled the tutors to achieve their learning objectives, 39% were neutral of the respondents with a mean of 2.46 and standard deviation 1.05. However 39% of the respondents disagreed on additional practice hours are scheduled with a mean of 3.08 and standard deviation of 1.44.

On adequate spacing in the skill laboratory, 39% were neutral and 23 disagreed with a mean of 2.92 and standard deviation of 1.19. The respondents were undecided on manageable ratio of lecturer to student during simulation as 31% agreed and 39% disagreed having a mean of 3.08 and standard deviation of 1.19. While on additional trainings on simulation, 39% were neutral and 23% disagreed with a mean of 2.92 and standard deviation of 1.19. This therefore implies that the nurse tutors perceived that simulation models at KMTC were yet to be fully efficient in achieving their teaching objectives. This could be mainly due to challenges that may be experienced such as inadequate resources and a high number of nurse students being enrolled in the school.

The study sought to ascertain the effectiveness of the simulation models as teaching strategy. As shown by Table 4.19, 62% of the respondents indicated that the simulation models were effective while 38% stated they were very effective. This implies that the nurse tutors felt that the simulation models have a played a huge role in how they conduct their teaching sessions.

Table 5 Effectiveness of the Simulation Models

Effectiveness	Frequency	Percent
Very effective	9	38.5
Effective	14	61.5
Total	23	100

The regression analysis was used to establish the relationship that exists between the research variables. The independent variable were perception on simulation, simulation models usage and perception of effectiveness of simulation by nursing students while the

21

dependent variable was simulation as a teaching and learning strategy. The regression model summary results obtained are shown by Table 4.23.

Table 6 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.538a	0.29	0.285	0.421

a. Predictors: (Constant), Simulation Application

The coefficient of determination R square is 0.29 and R is 0.538. The coefficient of determination R square indicates that 29% of simulation as a teaching and learning strategy is explained by its application at KMTC. This shows that the simulation application accounted for only a small proportion of variations in simulation as a teaching and learning strategy. Hence 71% the variations in simulation as a teaching and learning strategy is accounted for by factors other than simulation application at KMTC.

Table 7 Model ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	10.691	1	10.691	60.315	.000a
Residual	26.232	148	0.177		
Total	36.923	149			

a. Predictors: (Constant), Simulation Application

b. Dependent Variable: Simulation as a teaching and learning strategy

The ANOVA was further conducted which indicated that the significance of the model is 0.000 are which are less than both 0.01 and 0.05 as shown by Table 4.24. This thus shows that the regression model used was highly significant in explaining the utilization of simulation as a teaching and learning strategy. Hence, implying a good fit for the model since it shows a significant influence of the study variables. Therefore, at any particular time, perception on simulation, simulation models usage and perception of effectiveness of simulation to nursing students were able to predict any changes on Simulation as a teaching and learning strategy. The model coefficients obtained by the study are shown in Table 4.25.

Table 8 Model Coefficients

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.754	0.128		5.91	0.000
Simulation Application	0.469	0.06	0.538	7.766	0.000

a. Dependent Variable: Simulation as a teaching and learning strategy

From the results obtained, simulation application had a coefficient of 0.469, while the constant had a coefficient of 0.754. The positive coefficient shows that simulation application has a positive effect on simulation as a teaching and learning strategy. This shows an increase in this variable would result in its effectiveness. Hence, increase unit in perception on simulation, simulation models usage and perception of effectiveness of simulation of nursing students will translate on Simulation as a teaching and learning strategy improving by 46.9%. The simulation applications were significant at 95% since the p-values are less than 0.05.

9. CONCLUSION

The study found out the both the nurse students and the nurse tutors had a positive perception towards the utilization of simulation in teaching and learning. The study thus concludes that the nurse students have a positive attitude and acceptance towards the simulation models. This is attributed to the fact that it makes learning and teaching both easier and simpler. The study also found out that simulation models at KMTC were yet to be fully efficient in achieving their objectives. The study therefore concludes that KMTC is yet to fully and successfully integrate the simulation practices in their programs. This could be there reason why there are barriers that limit the effectiveness of the strategy. The study further found out that simulation application has a positive effect on simulation as a teaching and learning strategy. The study thus concludes that increasing the application of simulation in the institutions through more programs and practices will result in its efficiency being improved significantly.

10. RECOMMENDATIONS

Based on the study's findings, the study makes several recommendations. The study established that KMTC was yet to be fully effective in the implementation of simulations as a teaching and learning tool. The study therefore recommends that the management to highly prioritize this during strategy formulations and budgetary allocation. They should also redesign the curricula, train the nurse tutors and sensitize the nurse students on the importance of the adoption of simulation methods. The study also found out that the institution was strained by the having a high number of nurse students and low number of nurse tutors. There is therefore congestion and difficulties in accessing the simulator facilities such as laboratories. The study therefore recommends that the organization to come up with strategies to increase the facilities and personnel in the simulation sector. The study recommends that the Ministry of Health to develop and equip simulation laboratories across country, and not only KMTC only. The ministry should ensure that it has formulated and developed monitoring tools that will act to ensure that there are proper simulation facilities in all the clinical institutions. They should also put measures to provide mentoring and continued support to the simulation programs integration.

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