



Qualitative perspectives of teaching and learning in clinical skills laboratories in a developing country

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ABSTRACT

Introduction: Simulation laboratories help students build a strong foundation of clinical competence in a stress-free environment. There is a paucity of research findings on this topic from nursing education institutions in resource-constrained countries. An evaluation study was therefore conducted at the Kamuzu College of Nursing in Malawi. The purpose of the study was to explore the experiences of students and educators on teaching and learning in a college-based skills laboratories.

Data were collected using in-depth and focus group interviews with nurse educators (n = 6) and students (n = 45) respectively following semi-structured interview guides. Seven focus groups were conducted with students and six in-depth interviews with nurse educators. Data were managed using a MAXQDA software and analysed thematically. Ethical approval was obtained from the Human Research Ethics Committee, University of the Witwatersrand and the College of Medicine Research Ethics Committee, University of Malawi. The findings show that demonstrations, return demonstrations, practise sessions and resources contribute effectively to learning. Hasty demonstrations, limited practice time and inadequate resources, affect learning negatively.

Conclusion: Increasing practise sessions, increasing staff and modernizing resources, can improve the quality of learning with respect to transitioning to practice and building students' competence and confidence.

1. Introduction

The Kamuzu College of Nursing is one of the oldest institutions of higher learning for nursing and midwifery education in Malawi. Following global trends in nursing education, the college adopted the usage of skills laboratories for clinical teaching, learning and evaluation in undergraduate nursing and midwifery education. Prior to the advent of skills laboratories, and for the longest period of time, clinical teaching at the college followed the apprenticeship model where students learned and were evaluated at the bedside of patients. Due to multiple constraints in clinical service sites, clinical teaching, learning and evaluation remained a challenge for both nurse educators and students. Some of the challenges included resource scarcities, patient and student congestion in the clinical sites and ethical dilemmas associated with using humans, again and again, to standardize clinical learning experiences (Malawi National Training Operational Plan, 2011; Shellenbarger and Hagler, 2015).

As a consequence, the college under study adopted simulation laboratories for clinical teaching and learning. In this paper, simulation

laboratories have been used as a synonym for skills laboratories. Since its inception, this initiative has not been evaluated to assess the impact on student teaching and learning. In view of this, the study was conducted to evaluate how clinical teaching and learning in the skills laboratories are being experienced from the perspectives of nurse educators and undergraduate students. This paper presents the qualitative findings from their perspectives on teaching and learning in simulation laboratories in a university nursing college environment.

2. Study purpose and objectives

2.1. The purpose of the study was to explore the experiences of students and educators regarding teaching and learning in college-based skills laboratories.

Specifically, the study set out to:

explore and describe students' and educators' perspectives of clinical demonstrations in the skills laboratory;

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extrapolate from these perspectives, the factors and issues that affect clinical learning in the skills laboratories.

3. Methods

The study used a qualitative design, and in-depth and focus group interviews for data collection from 2016 to 2017. The interview guides contained semi-structured questions on teaching and learning experiences in the skills laboratory, factors promoting or impeding success and views on how to improve teaching and learning in the skills laboratory. The population of interest comprised two subsets namely, nurse educators (N = 30) and undergraduate nursing students (N = 891) at the Kamuzu College of Nursing. Nurse educators, including clinical supervisors, with a minimum of six months theoretical and clinical teaching experience, and students with two or more semester experience of learning in the college-based skills laboratories, were included in the study. Students who were in their first year of study, those who failed or who were once employed as enrolled nurses and midwives were excluded.

3.1. Sampling and sample size

Non-probability, purposive sampling was used to select the participants for in-depth (n = 6) and focus group interviews (n = 45). Sampling for representativeness of the nurse educators was observed by recruiting nurse educators from the three departments in the college: Community and Mental Health, Medical-Surgical Nursing and Maternal and Child Health Nursing. The educators had varied characteristics in terms of gender, qualifications, position and teaching experience. Student representativeness was observed by recruiting second, third and fourth year students from the student population grouped as junior (second years, Lilongwe campus) and senior students (third and fourth years, Lilongwe and Blantyre campuses). Both male and female students participated in the study.

3.2. Research setting

In-depth and focus group interviews were conducted in two rooms, designated for this purpose, on both campuses of the College. Except for their location both venues were similar in their size and content - venues were convenient for the interviews and were neutral environments with minimal noise levels for successful recording of interviews, and enabled freedom of expression for the participants.

3.3. Data collection process

In-depth interviews were conducted with six nurse educators. In addition, seven focus group sessions were held with 45 nursing and midwifery students, with group sizes varying between six and eight. In both interviews, two separate interview guides were used to collect data. The interview guides were piloted during two focus group sessions and one in-depth interview prior to the main study. The results from the trial run provided an opportunity to refine, adjust the questions and test the recording device for both interviews. The amendments involved grammar and reorganization of the questions; the pilot study data did not contribute to the main findings. In both groups, saturation was determined when no new data emerged during the interview process.

3.4. Ethics approval

Ethical approval was obtained from the University of the Witwatersrand Human Research Ethics Committee (M130527), the University of Malawi, College of Medicine Research Ethics Committee (P.07/13/1417). Before the interviews, all participants received an information sheet for them to understand the study purpose and for informed consent purposes.

3.5. Data analysis

Thematic data analysis commenced simultaneously with data collection until its completion. All data sets were transcribed verbatim and verified by an academic colleague with expertise in listening and analyzing law cases to ensure the validity of the data transcripts (Polit and Beck, 2019). Data transcriptions were imported to MAXQDA software version 11, enabling each portion of the narrative to be coded for retrieval and to be displayed in specified codes. MAXQDA was chosen for its usefulness in organising, managing and coding the data, and for its ability to examine relationships in codes and themes that emerged.

After the initial coding process, we followed a step by step process of thematic analysis, espoused by Braun and Clarke (2013). The steps involved familiarization with data, generating initial codes, searching for the themes, reviewing and refining the themes, defining and naming the themes, and the production of the report. Specific to the analysis of focus group data, both the group and individual participants' data were useful as advocated by Jamieson and Williams (2003). At group level, responses were subjected to both interactional and sequential analysis, considering the issues of conformity and 'group thinking' (Jamieson and Williams, 2003) while at individual level, responses were analyzed in response to the group context and the congruency to the study objectives. Important themes and concepts were isolated from the data (Polit and Beck, 2019).

Although verification of themes with participants is recommended in qualitative studies, it was not done due to unanticipated events, which led to the abrupt closure of the institution at a time when verification was to take place. Throughout the analysis, deductive reasoning facilitated the reduction of teaching and learning data. Definition and examination of each theme in relation to the overall narrative occurred to generate clear definitions and names for each theme. Three themes and eight sub-themes emerged on completing the data analysis.

3.6. Academic rigour

For qualitative quality control, three strategies were adopted namely: credibility, consistency and confirmability (Polit and Beck, 2019). Credibility was ensured by following the processes of qualitative research design, using focus and in-depth methods of enquiry and thematic data analysis. During data collection, the researcher established a relationship with the participants to build trust and elicit the right information from their personal perspectives. Data were recorded to capture all the relevant data and transcribed verbatim to maintain the meanings thereof. Field notes taken during in-depth and focus group interviews and working together with the co-coder ensured accuracy of the data transcription and analysis processes.

In terms of consistency, the dependability of the research was maintained by the description of the research process from the development of the proposal, data collection, analysis and presentation of findings with excerpts supported by literature. In addition, prior to data collection, piloting of the interview guides took place to test the questions framed. The findings from the trial run of the instruments, led to amendments of the interview guide and reordering of the interview questions. Thereafter, a full report was written.

To ensure confirmability, interviews were transcribed verbatim and audited by an expert in listening to and analysing law cases. Data were entered into the MAXQDA software for organization and management of the data. The software also supported the process of coding. The researcher used the co-coder to verify the transcripts, codes and themes. In addition, the truthful value of the research was maintained by the field notes and recording of data throughout the analysis process. A reflection of supporting excerpts from the individual participants is present in the presentation and discussion of findings. Data were stored in computer-based files that were password protected.

4. Findings

4.1. Demographic data

The age of the participants ranged from 30 to 62 years (nurse educators) and 21 to 28 years (students). Nurse educators' years of experience in clinical teaching in college-based skills laboratories ranged from one and a half to 12 years. Students' learning experience, in years, in skills laboratories ranged from one and a half to three and a half years. In terms of gender, all, except for one focus group session, were homogenous in gender orientation, which helped to promote free expression.

4.2. Themes and sub-themes

The findings are presented in three themes: theme 1 focuses on nurse educators' perspectives of teaching, theme 2 focuses on students' perspectives of learning, and theme three presents combined perspectives on the challenges that affect the quality of teaching and learning in skills laboratories (Table 1).

4.3. Theme 1: Educator clinical teaching perspectives

In this theme, both positive and negative experiences were expressed. Positively, teaching in the simulation laboratories provides an opportunity for demonstrations and return demonstrations using the ideal resources available in the skill laboratory. In addition, nurse educators have the passion to demonstrate clinical skills to the different groups of students. However, some organisational issues, limited resources and increased teacher-student ratio make the teaching experience stressful.

4.4. Sub-theme: Clinical demonstrations as nursing's reality

Demonstration is an essential strategy for teaching clinical skills and so too are students' return demonstration under supervision (Quinn and Hughes, 2013; Bruce and Klopper, 2017). Nurse educators' expressed an ability to conduct clinical demonstrations with the opportunity for students to do return demonstrations. Being able to use the ideal equipment, facilitates the clinical teaching process because it exposes the students to the real equipment, which in many practice settings in Malawian hospitals may not be available. Nurse educators expressed that clinical demonstrations give students the chance to observe the reality of nursing. Learning through observations and practise sessions is initiated with their support as expressed below:

"...it makes the teaching a reality of nursing,... with demonstrations, students are so excited when they see something from whatever you have taught them because they are able to apply, so it has been quite motivating..."(P1).

"....I would like to say that the skills lab has been very useful in terms of teaching the students... the use of the lab gives the students an opportunity to observe the demonstrations...."(P4).

Table 1
Themes and Sub-Themes.

Themes	Sub-themes
Theme 1: Educator clinical teaching perspectives	<ul style="list-style-type: none"> • Clinical demonstrations as nursing's reality • Intrinsic and extrinsic motivators • Double load, double stress
Theme 2: Nature of learning from practise sessions	<ul style="list-style-type: none"> • A way to transition to practice • Gaining competence and confidence
Theme 3: Quality of teaching and learning perspectives	<ul style="list-style-type: none"> • Resource limitations • More students, more haste • Lamenting organizational factors

4.5. Sub-Theme: Intrinsic and extrinsic motivators

Nurse educators' own passion for clinical teaching was highlighted as something that motivates them to maintain quality standards despite the resource constraints encountered. Positive feedback from students about their learning in the skills laboratory acts as a motivator for teaching sessions. Students' enthusiasm during clinical demonstrations and their verbal comments that they learnt a lot in the skills laboratory, encourage nurse educators' desire to provide high quality practical sessions in the skills laboratories.

"We have passion to still go through the skills lab despite those constraints, so our passion is really driving us to continue despite those constraints...." (P6).

"...we also get a chance to have the feedback from the learners themselves, they say that they are satisfied and feel they are learning a lot in the skills laboratory despite the constraints, so we feel there is an impact..."(P6).

4.6. Sub-Theme: Double load, double stress

Despite the success stories in a simulated learning environment, nurse educators expressed that clinical teaching is also stressful because of large student numbers. It doubles their workload to demonstrate and observe students during return demonstrations because of the staff shortages, making it difficult for them to observe every student doing a return demonstration and to give meaningful feedback.

".... it is very tough to demonstrate to the students because the students are too many,... a ratio of 1 teacher to more than 25-30 students per session, so it's difficult, stressful to observe them to perform individual return demonstrations"(P4).

"....it has not been easy to use the skills lab for the lab sessions....with the number of students we have it is difficult to observe every student do the return demonstrations and give them individual feedback"(P3).

4.7. Themes 2: Nature of learning from practise sessions

In this theme, the students expressed their views on how learning to practice takes place in the simulation laboratories. The students appreciated the privilege to practise skills prior to clinical practice exposure. They acknowledged that the available resources, although limited, help them to experience the ideal way to practice nursing that is different to the way they learn in the clinical practice environment. The students considered simulated practise sessions as the most appropriate way of transitioning from theory to clinical practice, an environment to build confidence and gain competence.

4.8. Sub-theme: A way to transition to practice

Students expressed appreciation for the clinical learning sessions in the skills laboratory and felt it as a primary link to the practicality of the theory they had learnt. In addition, the initial experiences in the skills laboratories help them to transition from learning in the laboratory to learning in the clinical practice sites. The quality of their learning in the skills laboratory thus determines how well they transition to and prepare for practice. Practicing in resource-constrained clinical environments pre-empts the need for students to improvise learning in a simulated environment that enables students to match more closely to resources they need to use during improvisation in the real setting.

"... in the skills lab, from the theory we are able to transfer the theory into action, it's like an overview of what is going to happen in the ward so it's like we get prepared for that..." (G5S3).

"...because you have an idea of what kind of resources that you need for each and every type of procedure, when you go to the hospital... you are

able to improvise something that is similar to something that will help you conduct that procedure in the similar manner (G6S5).

"the skills lab also gives us the chance to make mistakes that you can't make them on human beings so I think it is good that we have to practise in the skills lab before we go into the wards" (G2S4).

4.9. Sub-Theme: Gaining competence and confidence

This sub-theme captures students' views of becoming competent and confident during simulation-based learning. They experience the practise sessions as a way of developing in them, a sense of confidence, which contributes to the development of competence. Students felt that the skill laboratory environment equips them with baseline competencies prior to them practising on human beings.

"It's really nice to go through the laboratory before we work with normal/real people... the skills lab provides us with the baseline competences. You have to start with mastering the theory before going to the clinical..." (G5S1).

"it also helps us to be confident enough because when you practice a lot in the skills you become competent in whatever you do that means you will not be doing harm to the patient you will be doing it the way it has to be done" (G2S2).

4.10. Theme 3: Quality of teaching and learning perspectives

This theme captures both nurse educators' and students' views on issues that affect the quality of teaching and learning in the skills laboratories. Despite the best intentions, participants found that resource issues, and organizational factors detract from the quality of clinical teaching and learning in skills laboratories.

5. Sub-Theme: Resource limitations

Although skills laboratories have limited material resources compared to other well-resourced facilities, this limitation still makes a difference in the quality of clinical teaching because of the magnitude of resource constraints in many clinical settings. The skills laboratories under study have a good number of resources but not adequate for the student numbers. Examples include family planning equipment and midwifery manikins comparing with what is available in the clinical sites. As such, the students have an opportunity to practise using ideal resources that are not available in the clinical sites making learning for the practice of nursing and midwifery a reality. Thus, for onsite learning, increasing the use of portable resources was advocated. In addition, the participants reported that some resources are outdated and needed replacement with more modern resources and equipment.

"...the students have had an opportunity to have an exposure to some of the resources that are not available in the clinical area" (P6).

"Actually the models we are using these days are portable, we need more of these portable resources for on-site skills laboratory at the practical site for students to use them" (P1).

"...in the other skills lab we do have some outdated old resources but we are in a current era with some new things coming so maybe management should also take that into account (P2).

5.1. Sub-Theme: More students, more haste

Students expressed that an increase in the student to educator ratio contributes to educators conducting clinical demonstrations hastily, in order to reach all groups waiting for the same learning opportunity. They felt that effective learning does not take place, which contributes to limited or no practise opportunities at all for the majority of the students, which negates the purpose of the skills laboratories.

"...they (nurse educators) do things in a hurry to finish the whole group of two hundred something on a day... giving each group thirty minutes doesn't permit time for return demonstrations" (G2S1).

"...If the clinical instructor/nurse educators had ten students per session, then learning would have been better" (G7S2).

5.2. Sub-Theme: Lamenting organizational factors

Lamenting organizational shortfalls with respect to staffing and clinical laboratory logistics, both students and nurse educators expressed concern about the negative impact on the quality of clinical teaching and learning. Organizational factors include failure to utilise the skills laboratory hours for its intended purpose, rules governing the skills laboratory and quantity of staff. It was highlighted that sometimes, lecturers utilize the scheduled laboratory hours to finish theoretical content of courses. In addition, the skills laboratories are open mostly when students are either in class or in clinical placements. Due to the limited number of staff in the skills laboratory, this space is operational from 7.30 am to 5 pm, making it difficult for students to access the skills laboratory thereafter. Thus, the quality of learning experiences is compromised because the students are likely having more clinical experiences from the clinical sites where a lot of improvisation exists.

"...most of the times the teaching simulation hours are used for completing theory by the educators, lab hours with the students is sometimes overlooked despite the benefits..." (P1).

"... the students will only have time to use the skills laboratory either after 5o'clock or may be during the weekend which unfortunately the lab is closed..." (P3).

"...it would be better may be to recruit three nurse educators so that they will be changing their rosters because we want them to be operating like the library from Monday to Friday 7.30am to 10 pm..." (P6).

6. Discussion

From an educator's perspective, clinical demonstrations make teaching a reality because students have a chance to observe and conduct return demonstrations albeit within limited time. Although, clinical teaching is stressful, the passion and students' positive feedback about the benefits of the clinical demonstration session, provides the motivation for teaching the students. The use of ideal resources during demonstrations facilitates learning more positively. On the other hand, students felt that skills practise sessions help them to transform theory into action, allowing them to make mistakes and to rehearse or practise using the ideal resources available in the skills laboratory. The learning opportunities and experiences gained, equip them with confidence and provide the basis for building confidence.

Evidence from other authors support the findings that the demonstration of skills is an essential strategy for teaching clinical procedures (Houghton, Casy, Shaw and Murphy, 2012; Meyer, Marzen-Groller, Myers, Busenhart, Waugh and Stegenga, 2014; Landeen, Pierazzo, Akhtar-Danesh, Baxter, Eijk and Evers, 2015). Furthermore, clinical demonstrations give students the privilege to learn from the expertise of the faculty and allow them to role-play the skills for feedback and correction (Nilson, Pennbrant, Pilhammar and Wenestam, 2010; Houghton, Casey, Shaw, and Murphy, 2012). In a study conducted by Landeen et al (2015) in Canada, faculty expressed that during clinical demonstration, teamwork and communication skills among themselves as well as the students, are enhanced.

The benefits of skills laboratory learning for students prior to clinical practice placement has been similarly documented by other researchers (Ansary, Ara, Talukder, Alam, Amin and Rahman, 2011; Houghton et al., 2012; Foronda, Siwei and Bauman, 2013; Aggar and Dawson, 2014; Saaranen, Vaajoki, Kellomaki, Hyvarinen, 2015; Weatherspoon, Phillips and Wyatt, 2015). In these studies, students appreciated the

ability to grasp the concepts and be able to transfer theory into clinical learning experiences. The learners also expressed that skills laboratory experiences stimulate, encourage and facilitate their learning. Furthermore, in a study by Houghton et al. (2012), many students agreed that when the laboratory environment is similar to the hospital environment, students become better prepared for nursing practice. Students start embracing the caring role because of the confidence and competences they gain (Boellaard, Brandt, Johnson and Zorn, 2014). With regard to confidence and competence, Harder (2010), Lewis and Ciak (2011) found that clinical learning experiences in the skills laboratory increases confidence and competence among the students. The opportunity for hands-on practise, makes everything else meaningful and provides concrete experiences for students. Furthermore, in a study conducted among medical students by Dehmer, Amos, Farrel, Meyer, Neuton and Meyers (2013), it was suggested that there is need to maintain confidence and competence gained in the skills laboratories when the students are placed in the practical sites. Among fourth year medical students, it was observed that confidence and competence diminished because of limited exposure to the practical experiences. It was therefore suggested that educators ensure a more structured system with appropriately planned clinical experiences to maintain the confidence and competence gained even in clinical sites.

Commenting on educator to student ratios, Acton, Chipman, Lunden and Schmitz (2015), in their study on simulation at the University of Minnesota, found that simulation for the development of psychomotor skills, require active faculty involvement and reduced learner to faculty ratios to ensure sufficient practice with effective feedback. It was suggested that faculty should be creative to sustain and manage the workforce successfully and that appropriate measures to prevent faculty burnout should be put in place. It was also suggested that more qualified staff be recruited to consider nurse educator to student's ratio of 1 to 10 during practise sessions (Acton et al., 2015).

Evidence related to outdated and limited resources for clinical skills learning is not uncommon. Koretsky, Kelly and Gummer (2011), in their study of skills learning also showed that resources and equipment constraints remain a challenge in many institutions of higher learning. This leads to educators not achieving the intended learning outcomes. Similarly, in an explorative study in Norway by Haraldseid, Friberg and Aase (2015), to establish students' understanding of the clinical skills laboratory-learning environment at the college, it was found that the lack of equipment, the reuse of equipment and the availability of outdated equipment, made learning difficult. Although this was from a student perspective only, it is clear that resource and equipment constraints interfere with the students' acquisition of clinical skills (Haraldseid et al., 2015), which was also the case at the college under study. At the college under study, nurse educators made suggestions to purchase up-dated medium or high-fidelity teaching models to complement what the college already has. However, the cost of high fidelity manikins might be too high for developing and resource-constrained countries. In relation to high or medium fidelity manikins, Lapkin and Levett-jones (2011) suggest that using medium fidelity manikins is more cost effective than using high fidelity manikins. Furthermore, using low fidelity manikins offer the best opportunities for simulated practise of skills in most nursing and midwifery procedures (Shellenbarger and Hagler, 2015; Ricketts, 2011). It promotes active participation, provides instant feedback and a safe and non-threatening learning environment during repeated demonstrations. As such, it would be cost effective for the college to consider the purchase of both low and medium fidelity manikins for cost effectiveness with the increased student numbers.

Experiences from a Swedish university regarding operational hours of simulation laboratories, Ewertsson et al. (2015) found that students benefited from unlimited access to the skills laboratory. Students had enough hours to do procedures again and again to reach perfection. The students appreciated the privilege of repeated practice experiences of learning using both low and high-fidelity simulation. Limited time spent in the skills laboratory denies students the opportunity to deepen their

knowledge, understanding and application of their skills in the clinical site (Ewertsson et al., 2015). Even in student-led learning study conducted in a Canadian university, one group had time to practise on their own in the simulation laboratory while the other group of students did not have time to practise on their own (Hoogenes et al., 2015). They found that students who had a chance to practise or rehearse on their own felt that they had control over their learning and were more actively involved than a group which had no chance to practise on their own. It fostered more motivation and positive attitudes than the other group. The evidence suggests that active learning improves motivation and engagement in the process of learning (Hoogenes et al., 2015; Ewertsson et al., 2015). Repeated practice was greatly appreciated. However, the authors suggest that educators should be cautious on when to leave the students on their own because all students require expert demonstrations at the onset of their practical learning.

In terms of regulations that affect simulated teaching and learning, Svejda, Goldberg, Belden, Potempa and Calarcos (2012) suggest that nursing institutions should strive to create learning opportunities that enable students to achieve the leaning objectives. In addition, it is important to increase clinical hours even in simulation laboratories for students to gain competence and be confident to provide care.

7. Conclusion

The study sought to explore perspectives of teaching and learning during educator and student usage of clinical skills laboratories at a nursing college in Malawi. The findings show that these laboratories provide opportunities for educator demonstrations and student practise or repeat demonstration opportunities, which contribute effectively to teaching and learning in skills laboratories. The presence and passion of nurse educators and the availability of resources, not routinely available in clinical settings, make the laboratory environment more conducive to teaching and learning. Simulation practices help build confidence and to acquire essential competencies prior to be assigned to patient care/clinical experiences. Both nurse educators and students recommend increasing practice sessions, procuring new resources and equipment, improving staffing ratios in simulation laboratories, and extending practice hours. The purchase of more portable simulation resources for onsite clinical teaching and learning to reinforce learning when students are in clinical sites away from college, would enhance clinical learning. Nurse educators are encouraged to explore ways to maximise simulation laboratory usage to meet students' clinical learning needs.

Author contributions

I, Annie Msosa, as corresponding author, confirm that the manuscript has been read, supervised and approved by Professors Judith Bruce and Rosemary Crouch, as my supervisors from inception to completion. Therefore, they are the co-authors of this manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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