

Simulation-based Training in Nursing and Midwifery: A Literature Review

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Abstract

The purpose of the paper is to presents a literature review on various issues around simulation-based training in nursing and midwifery education. The review looked at both qualitative and quantitative studies conducted. The review starts with an overview of simulation training globally. The article further highlights on the importance of simulation based training as well as challenges faced by nursing and midwifery educators during simulation.

Keywords: Simulation, training, nursing, midwifery

Importance of simulation-based training

Simulation has globally been suggested as a new way to build skills among healthcare students within the high institution of learning (Kelly Hopwood, Rooney, & Boud, 2016; Shin, Park & Kim 2015). Lateef (2010) describe simulation as a technique that can amplify real experience with a guide one. Midwifery simulation –based training can be a tool that can mitigate litigations and ethical dilemmas that are very common in midwifery practice as it improve competency and confidence among students. Although the cost of simulation training is very high, it is worth it and can never be over emphasized as it act as a safety measure for patient safety. Therefore, simulation training refines skills needed to correct mistakes allowing the trainees to fine-tune the skills. In addition, simulation training helps to ensure that students and trainees gain clinical experience without having to depend on chance encounters of certain cases.

Simulation based training is very important as it offer ranges of benefits to students. In terms of knowledge simulation donates to expanding and consolidating students' knowledge building links for action, transmission value and endorsing its relevance (Dillard , Sid eras, Ryan , Carlton , Lasater, Siktberg,2009).Furthermore, simulation based training offers knowledge to a degree that students have option through simulation to use previous acquired knowledge and integrate theory into practice. Moreover, student reflect on the action and explain, justify it during debriefing in that way assigning value to tangible action and classifying, hence assigning values to concrete action and identifying required modification to develop students actions. Transferability of obtained knowledge into real situation during simulation based training has also been reported in various studies (Weaver, 2011; Baptista, Martins, Pereira, and Mazzo, 2014). A recent study conducted by Schneidereith, and Daniels, (2019) preliminary data shown that learning simulation experience helped to develop assessment, critical thinking, clinical reasoning, and decision making skills in multifaceted care situation. Above authors further stated that students also believed that they were well equipped to communicate with other health

care providers in this new role. Meaning simulation improves clinical experiences and allows for better learning assessment and better communication.

A literature review conducted by Calver, Mcgurgan, Debenham, Gratwick, and Maouris,(2013) on ninety-two articles about emergency obstetric simulation training which included conditions such as eclampsia, shoulder dystocia, postpartum haemorrhage, maternal collapse, cord prolapse identified that students could benefit in terms of knowledge, or skills from simulation training in small units without access to high fidelity equipment. The simulator was also evaluated to be effective training platform with outstanding fidelity and valid feedback mechanisms. It was demonstrated to be a feasible platform even for training Traditional Birth Attendances known as (TBAS). It is of the low cost, portable simulator and it believed to have potential to reduce maternal mortality from Post-partum haemorrhage (PPH) in developing world (Perosky et al, 2011). In addition, Nelissen et al, (2017) identified that introduction of obstetric simulation – based training was related with a 38% lessening in incidence of PPH and enhanced clinical performance of basic skills and management of PPH. Another study conducted in Senegal about improving obstetric haemorrhage using simulation indicated that training by simulation could highlight the various dysfunctions during obstetric emergencies. A pilot project conducted in Nigeria on simulation based PPH, showed an overall increase in their level of knowledge (Chukwu, 2017). On a contrary, a study conducted in Iran on comparing the effect of simulation competency of midwifery students on PPH found no significant difference in the groups that attended the simulation and that did not attend the simulation (Fakuri, et al., 2015).

Most studies in various clinical areas, which include midwifery showed clear benefits in cognitive and psychomotor domain. It is also associated with high fidelity(Yuan et al., 2012). Martins et al., (2012) identified that simulation promote skills such as intubation, conduct a delivery, management of shoulder dystocia , breech delivery and putting up intravenous line are becoming imperative. Simulation is used as learning strategy for assisting midwifery students in developing attitudes and behavior hence in applying ethical principles in clinical areas (Buxton et al., 2014). Moreover, it offers valid assessment of empathy, self-awareness and cultural awareness. Lendahls and Oscars son, (2017) indicated that simulation is greatly valued as students can have repetitive sessions with mistakes without fear of causing harm to patients. This therefore makes students more confident before their clinical placements (*ibid*). Literature indicated that students tend to be less anxious at the clinical practice after they had simulation training (Kelly. Butler. Dawn. & Veltre, 2006). Furthermore Jeffries and Rogers ,(2007) stated that students with limited clinical experiences have a fear of being overwhelmed and report high anxiety levels that can affect their learning This is a cause for concern, given that the major focus of clinical nursing education is facilitating the development of accurate clinical judgment, critical thinking, and clinical reasoning.

In their randomized clinical trial study, Steadman et al., (2006) found out that simulation-based learning is superior to problem-based learning for the acquisition of critical assessment and management skills. Moreover, high fidelity simulation –based training among team members at Harvard University was found to be highly effective and to have improved the behaviors of team

members (Shapiro et al., 2004). This was a single crossover, prospective, blinded, and controlled observational study. In the same study behavior, modeling was also done (*ibid*). Medium and/or high fidelity simulation using manikins is an effective teaching and learning method when best practice guidelines are adhered to Cant & Cooper (2010). However, high fidelity simulation equipment are not always available in developing countries such as skills laboratory due to lack of finances but this cannot prevent them from using simulations as low fidelity equipment are readily available and have a similar impact.

In addition, Simulation-based learning can provide repeated exposure to rare events in a learner-centered environment that could be made appropriately complex for the learner's stage of training. It also offers chances for students to undertake leadership roles that they could not assume in the clinical setting. Maginnis et al.,(2014) states that the simulation laboratory is key strategy where teamwork could happen that delivers the chances to practice the required skills by means of simulation activities. By giving basic visual, auditory, and tactile cues it generates a high level of physical, biological and psychological fidelity to the real environment and hence is capable to stimulate realistic responses from trainees (Halamek, 2008).

The Importance of Debriefing in Clinical Simulations

According to Sittner, and Todd, 2006, debriefing foster and enhance critical thinking skills through the practice of psychomotor skills and therapeutic communication techniques. This is supported by a study conducted by Cantrell (2008) that indicated that debriefing immediately after the simulation help students to decompress and integrate the experience into their knowledge base. Additionally, debriefing sessions shows the educator the shortcomings of the students that need to be addressed before the students are allocated to clinical practice (*ibid*).

In the literature, there are two comprehensive ranges of performance debriefing known as formative and summative. Most of health care based simulation debriefing is used as formative because its aim is to reform student clinical performance before send to clinical practice; rather than to allocate passing marks like in summative. According Rudolph et al., (2008) debriefing as formative assessment in health simulation is presented into crucial four steps. The four important steps are to (1)noticeable performance gaps related to predetermined objectives , .meaning objectives might be well defined and specified beforehand , because well-defined objectives affords the opportunity to examine how closer students' performance has approached a problem at hand. This step offer the evaluators to check what needs to be done to bridge the gap observed between performance and problem given. Debriefing used to ensure that specific learning outcomes are achieved. Moreover, structured debriefing gives the opportunity to explore the candidate's pre-existing knowledge and to understand the reasons behind any deviation from expected practice.

The second step of debriefing is to offer feedback recitation the gap; In a guided reflection the educator gives the students with time to explore the results based on the objectives and decisions (Shin nick et al., 2011). In this regard debriefing in simulated practice gives a main opportunity for students to arrange their thinking process during and after the simulated procedure and also

reflect on action, hence assisting students to consolidate knowledge and change behavior (Coutinho et al., 2014).

In addition, the third debriefing step includes examining the base for the gap by exploring the limits and emotions contributing to the current performance level. Recent literature has proven that in-depth debriefing was significant to foster professional identity committed to empathy and patients' interests. Activities planned to discuss the effect and significance of emotions in medical practice can assist students to resolve personal and professional identities (Schweller et al., 2018).

The last debriefing step is to assist to close the performance gap through discussion about values and skills relevant to performance. Debriefing focusing on human factors might help to create an open culture and could train health professionals to discuss near misses, mistakes and adverse events, which might have direct implications on patient safety (Ziv, Small, and Wolpe, 2000). Centre for Medical, Simulation, (2016) indicated that one of primary goals of debriefing is to help students to reflect, understand, analyze and synthesize what they thought felt and did during simulation. For this reason, debriefing is recognized as a key feature to foster critical thinking and judgment among students thus improve future performance (Al Sabei & Lasater, 2016). The authors further stated that debriefing enhances learning by giving opportunity for reflecting one's experiences making decision, identifying gaps in knowledge and transferring knowledge to practice. This therefore means that when debriefing is used in a form of questions during simulation it provided opportunities for reflection-enhanced participant's knowledge and impacted their self-confidence. According Verkuyl et al., (2017) one of the attributes of debriefing is individual reflection, the ability to repeat the experience and analytics that could be included in the debrief phase. Through debriefing the skilled educators enhanced meaningful, dialogical engagement by assisting students to navigate diverse peer perspectives and integrate theory into practice.

Challenges faced by nursing and midwifery educators during simulation

Nurse educators are challenged to find adequate clinical experiences for nursing and midwifery students (Butler, Veltre, & Brady, 2009). Rhodes and Curran (2000) indicated that limited clinical time in midwifery training, clinical facilities, and shortened lengths of stay for patients affect the opportunities for clinical experiences with patient care situations. Furthermore, Lukasse, Lilleengen and Fylkesnes, Henriksen (2017) concurred with the above outcome when they found in their mixed method study in Norway that more time for exposure during simulation was needed for students to gain necessary competence before clinical placement.

Eraut in Haigh (2007) stresses that for simulation to be effective the nature of simulation time have to be manipulated to suit student learning needs to allow enough time to discuss and analyze theory and to articulate implied knowledge. Moreover, competition among nursing schools for clinical placement at midwifery disciplines also poses a challenge to educators, as they do not find real life cases to teach students in order to link theory and practice and to

provide students with a variety of experiences (Williams, 2006). This therefore put patients at risk of being cared for by student who are not competent enough to care for them.

The International Confederation of Midwives (ICM) and the United Nations Population Fund (UNFPA) (2009) pointed out that the effort to train more midwives especially in the developing countries is challenged by limited infrastructure, such simulation laboratories, few clinical instructors, few preceptors, large number of students, and poor resourced clinical sites. Fullerton et al., (2016) provided evidence of lack of skills laboratories, computer required for evidences and competency – based education in existing schools. Lack of such as the signal functions of basic emergency obstetric and newborn care. Authors on above study stated that students from existing schools of nursing might feel unprepared and might require longer period of supervised after employed or some are forced to resign (*ibid*). A Study conducted by Fullerton et al ., (2011) in three African countries concerning midwifery training expressed concern in securing access to clinical practice experiences for enrolled students for specific clinical situations that occur unexpected for example management postpartum haemorrhage (PPH). These skills could be demonstrated and practiced on models and in simulated situations. However, most developing countries do not have enough resources to buy materials for simulation. Furthermore these artificial situations do not require that learners react (think, act, evaluate) in the short timeline of a true emergency neither rare simulated practices suitable to permit students to complete their programme of studies. There is therefore a need to support and strengthen simulation based training in developing countries.

A recent study done in Malawi about nursing education challenges and solutions in Sub Saharan Africa indicates that Sub Sahara Countries have increased healthcare training intakes in order to resolve shortage of human resource crisis, especial nurses and midwives. This has led to congestion of students in simulation laboratory and clinical sites thus, compromising quality of patient care in real clinical setting. Therefore, an increased intake of nursing students requires innovative ways to train these growing numbers (Bvumbwe, and Mtshali, 2018).Simulation has globally been recommended as a new way to build skills among students within higher institutions of learning that train nurses and midwives (Kelly et al. 2016; Shin, Park & Kim 2015).However, in most Sub-Sahara countries regardless of the growing number of students, there are no adequate or advanced simulation laboratories and the numbers of clinical practice sites have remained the same (Msiska, Smith & Fawcett 2014). Students are competing for clinical learning opportunities and resources. Literature has shown that clinical staffs usually do not have adequate time for student clinical teaching owing to duo roles (Msiska, Smith & Fawcett 2014).Fullerton et al., 2011; in their studies identified similar challenges, which included the competing demand for midwifery experiences by midwives students in clinical settings which pushing training institutions to send students across the country to areas where clinical instructors are unable to follow them up. Moshiro, Ersdal, Mdoe, Kidanto, and Mbekenga, (2018) pointed out that the existing skills training on manikin is not appropriate to prepare for actual resuscitation. The manikins do not respond in any way when some of interventions are performed on it. However, a study on simulation exercise to prepare student on neonatal resuscitation revealed a contrasting outcomes as it improved student confidence and greater

knowledge and skills in neonatal resuscitation (Carolan-Olah, Kruger, Brown, Lawton and Mazzarino, 2016).

According to Ballie et al. (2008) effective simulation requires small groups in the presence of appropriate educators. Kilmon et al., (2010) shared the same argument stating that compliant with smaller groups of students could be an asset to clinical educators during teaching and training of clinical nursing skills. Hence, careful planning of students learning experiences in both theory and practice is imperative to ensure that teaching and learning and service delivery are not negatively affected.

Conclusion

Simulation based training in nursing and midwifery is an important educational aspect as it helps students to simulate clinical procedures and gain confidence before they practice to the patients, thus ensuring patient safety. Nurse educators should ensure that students are divided in small groups during simulations so that they all get chances to practice and gain competency. It is recommended that the donor agencies should support the developing countries with resources needed during simulation training. There is a need to conduct more researches on simulation-based training in nursing and midwifery training in especially in Namibia as there were no known study conducted before regarding simulation based training.

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