Nurse Education Today 58 (2017) 25–31

Contents lists available at ScienceDirect

Nurse Education Today

journal homepage: www.elsevier.com/locate/nedt

Interprofessional simulation of birth in a non-maternity setting for pre-professional students☆,☆☆,☆☆☆

Gayle McLelland[a,*], Chantal Perera[b], Julia Morphet[a], Lisa McKenna[c,d], Helen Hall[a], Brett Williams[e], Robyn Cant[f], Jill Stow[a]

[a] School of Nursing and Midwifery, Monash University, PO Box 527, Frankston, Victoria 3199, Australia
[b] Faculty of Science Health and Engineering, School of Nursing, Midwifery and Paramedicine, University of Sunshine Coast, Sippy Downs, Queensland 4556, Australia
[c] Nursing and Midwifery, George Singer Building room 317, College of Science Health and Engineering, La Trobe University, Bundoora, VIC 3086, Australia
[d] School of Nursing and Midwifery, University of Queensland, Australia
[e] Department of Community Emergency Health and Paramedic Practice, Monash University, PO BOX 527, Frankston, Victoria 3199, Australia
[f] School of Nursing and Midwifery, Monash University, Building 903, Clyde Road, Berwick, Victoria 3806, Australia

ARTICLE INFO

Keywords:
Birth
Emergency department
Education
Simulation-based learning
Midwifery
Nursing
Paramedicine
Undergraduate students

ABSTRACT

Background: Simulation-based learning is an approach recommended for teaching undergraduate health professionals. There is a scarcity of research around interprofessional simulation training for pre-professional students in obstetric emergencies that occur prior to arrival at the maternity ward.
Objectives: The primary aims of the study were to examine whether an interprofessional team-based simulated birth scenario would improve undergraduate paramedic, nursing, and midwifery students' self-efficacy scores and clinical knowledge when managing birth in an unplanned location. The secondary aim was to assess students' satisfaction with the newly developed interprofessional simulation.
Design: Quasi-experimental descriptive study with repeated measures.
Setting: Simulated hospital emergency department.
Participants: Final year undergraduate paramedic, nursing, and midwifery students.
Methods: Interprofessional teams of five students managed a simulated unplanned vaginal birth, followed by debriefing. Students completed a satisfaction with simulation survey. Serial surveys of clinical knowledge and self-efficacy were conducted at three time points.
Results: Twenty-four students participated in one of five simulation scenarios. Overall, students' self-efficacy and confidence in ability to achieve a successful birth outcome was significantly improved at one month ($p < 0.001$) with a magnitude of increase (effect) of 40% ($r = 0.71$) and remained so after a further three months. Clinical knowledge was significantly increased in only one of three student groups: nursing ($p = 0.04$; $r = 0.311$). Students' satisfaction with the simulation experience was high ($M = 4.65 / 5$).
Conclusions: Results from this study indicate that an interprofessional simulation of a birth in an unplanned setting can improve undergraduate paramedic, nursing and midwifery students' confidence working in an interprofessional team. There was a significant improvement in clinical knowledge of the nursing students (who had least content about managing birth in their program). All students were highly satisfied with the interprofessional simulation experience simulation.

☆ Acknowledgements/contribution: Teaching and Learning Grant Faculty of Medicine, Nursing and Health Science, Monash University.
☆☆ Authors contributions: Gayle McLelland (GM), Chantal Perera (CP), Julia Morphet (JM), Helen Hall (HH) and Jill Stow (JS) conceived the study. GM, CP, JM, HH, JS, Lisa McKenna (LM) and Brett Williams (BW) were substantially involved with the design of the study. All authors were involved with the analysis and interpretation of the data and writing the manuscript. GM takes responsibility for the paper as a whole.
☆☆☆ Funding: The project was funded by an internal teaching and learning grant provided by the Faculty of Medicine, Nursing and Health Science at Monash University.
* Corresponding author.
E-mail addresses: Gayle.McLelland@monash.edu (G. McLelland), cperera@usc.edu.au (C. Perera), Julia.Morphet@monash.edu (J. Morphet), l.mckenna@latrobe.edu.au (L. McKenna), Helen.Hall@monash.edu (H. Hall), Brett.Williams@monash.edu (B. Williams), Robyn.Cant@monash.edu (R. Cant), Jill.Stow@monash.edu (J. Stow).

http://dx.doi.org/10.1016/j.nedt.2017.07.016
Received 2 July 2016; Received in revised form 27 June 2017; Accepted 30 July 2017

1. Introduction

Paramedics and nurses can be the first health professionals to provide care for pregnant women in unplanned births that occur in the community or in emergency settings. Although infrequent, birth before arrival (BBA) at an unplanned place of birth, is increasing in Australia (Kildea et al., 2015; McLelland et al., 2013a). Whilst obstetric emergency management is a key principle underpinning midwifery education (Australian Nursing and Midwifery Council, 2006), and is included to varying levels in all Australian paramedic training programs (Council of Ambulance Authorities, 2014), it is not mandatory in undergraduate nursing curricula (Australian Nursing and Midwifery Accreditation Council, 2012).

There is a dearth of research about whether inter-professional teams consisting of midwifery, paramedic and nursing students have the confidence and knowledge to manage a BBA in an unplanned location. A simulated interprofessional education activity aimed to investigate whether a simulation would increase final year undergraduate paramedic, nursing and midwifery students' confidence and clinical knowledge in managing birth in an unplanned location. The secondary aim was to assess student satisfaction regarding a purpose-designed simulation.

2. Background

The rate of BBAs has increased in Australia, and this has been linked to the policy of closing small maternity units over the last 20 years (Kildea et al., 2015). BBAs are known to occur in both rural and metropolitan regions. Although the number of BBAs is relatively small, at around 0.49% of births nationwide (Kildea et al., 2015), this represents a stressful birth experience for around 1100 women per year. As first responders either in the community or in an emergency department, the maternity knowledge of paramedics and nurses is central to this issue. Whilst midwives have expertise in the management of childbirth, paramedics and nurses have considerably less expertise and often lack confidence (Blake, 2012; Lyons, 2010; McLelland et al., 2014). The outcomes for mothers and babies after BBAs (*even those occurring in an emergency department*) have been shown to be poorer; which have been attributed to a lack of appropriate management immediately after the birth (Unterscheider et al., 2011). Nurses and paramedics could therefore play an important part in improving these outcomes and as such, studies have called for more paramedic education (McLelland et al., 2014; Unterscheider et al., 2011).

Simulation-based education is an integral component of undergraduate midwifery curricula and is recommended as a method to teach students about infrequently occurring cases (Cooper et al., 2012) as in obstetric emergencies. Based on goal-based role plays and using a replica woman (a manikin or actor as simulated patient [SP]), this approach has the benefit of providing students with authentic practice of a range of skills without risk to any real person (Motola et al., 2013). Compared to traditional teaching methods including didactic lectures and skills-based clinical laboratories, simulation-based education involving deliberate practice has been shown to be more effective in the acquisition of skills and knowledge in paramedic (Williams et al., 2009) and medical education (McGaghie et al., 2011). The process of *interprofessional* education occurs when individuals from two or more professions learn with, from, and about each other to improve collaboration and the quality of care (Barr et al., 2006). With students in the pre-professional environment, interprofessional education enables increased understanding of the roles of other professions' when working in teams (Thistlethwaite, 2012) as well as a sense of their own professional identities (McLelland et al., 2013b), thus facilitating effective teamwork. When simulation education for training in obstetric emergencies is conducted with interprofessional teams of qualified physicians/midwives, it improves obstetric emergency management (Calvert et al., 2013; Deering and Rowland, 2013; Freeth et al., 2009). In a recent review of obstetric literature regarding acute situations, it was found that interprofessional training using simulation improved clinicians' knowledge, communication, and team performance (Merién et al., 2010).

When developing learning outcomes it is important that they are congruent with the tools used to measure desired educational outcomes (Salas et al., 2009). In addition to measuring changes in students' knowledge of emergency births, we also aimed to measure changes in perceived self-efficacy of their role in managing an emergency birth. Self-efficacy is defined by Bandura (1997) as an individual's future-oriented optimistic belief in their own ability and skills to achieve goals or objectives. High self-efficacy scores are associated with greater motivation and better performance (Bandura, 1997). Greater improvements in self-efficacy have been demonstrated among postgraduate students when participating in interprofessional rather than uniprofessional simulation activities (Watters et al., 2015). Multiple healthcare student disciplines (not including paramedicine or midwifery) have shown significant improvement in self-efficacy after participating in a program of interprofessional clinical training (Nørgaard et al., 2013; Tofil et al., 2014).

Simulation is a recommended modality to teach paramedic students about pre-hospital care (Boyle et al., 2007) and is embedded in nursing and midwifery curricula (Cooper et al., 2012; Ricketts et al., 2013). Thus, in line with the course emphasis on interprofessional education, the current intervention was developed to enhance final year paramedic, nursing and midwifery students' interprofessional training for obstetric emergencies using simulation-based learning.

3. Methods

This quasi-experimental repeated measures study was conducted in 2014 using a purposely developed scenario of a birth in the emergency department. The sample was a small group of final year paramedic, nursing and midwifery students from one university in the state of Victoria, Australia.

To enhance teamwork, interprofessional practice is dependent upon the individual practitioners' contribution of their own knowledge to the group's knowledge, and developing understanding of each other's roles. The simulation was informed by cognitive learning theories which state learning is based upon an individual's previous experience, knowledge, beliefs, culture and attitudes (Braungart et al., 2011; Hughes and Quinn, 2013). The aims of this study were threefold. The first two were to examine whether an interprofessional team-based simulated birth scenario of managing birth in an unplanned location would improve undergraduate paramedic, nursing, and midwifery students' self-efficacy scores and clinical knowledge. The final aim was to assess students' satisfaction with the newly developed interprofessional simulation. The University (blinded for review purposes) Human Research and Ethics Committee approved the study.

3.1. Sample Selection

Final year students from three disciplines: paramedicine, nursing and midwifery were given an explanation of the project by faculty and invited to participate. A convenience sample of volunteers comprised ten paramedic, ten nursing, and four midwifery students. Students were recruited and allocated according to their availability. The participating students provided written consent to participate and for the video and audio recordings of the simulation and debriefing.

3.2. The Intervention

All final year students in paramedic, midwifery and nursing courses completed pre-preparation: traditional classroom education about clinical management required during and immediately after, an uncomplicated spontaneous vaginal birth in an unplanned location. This