Call the Midwife: A mixed method evaluation of obstetric emergency training on participant confidence.

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School of Allied Health

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The research involving human data reported in this thesis was assessed and approved by The University of Western Australia Human Research Ethics Committee. Approval #: RA/4/1/8888

The following approvals were obtained prior to commencing the relevant work described in this thesis: East Metropolitan Health Service – Human Research Ethics committee. Approval #: RGS000000096

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Date: 9th May 2019
Abstract

Obstetric emergencies cannot be predicted. It is imperative therefore that staff who may encounter such an emergency are equipped to deal with a crisis situation. Midwives and obstetricians are experienced in managing adverse obstetric situations since it is incumbent in their roles and such preparation is included in their mandatory training. However, clinical staff within the Emergency Department (ED), Operating Theatre (OT) and Intensive Care Unit (ICU) are not so prepared, yet they are often expected to attend such emergencies. Recognition of serious illness in a pregnant woman can be challenging.

A study day program of theory and simulated obstetric emergency drills was developed for the doctors, nurses and anaesthetic technicians from the above three clinical areas with the objective of providing the participants with the knowledge and skills to recognise and provide the first line management of obstetric emergencies until the arrival of the obstetric team.

The aim of this study was to explore if attendance at the newly developed Hospital Emergency Response – Obstetrics (HER-Obs) study day increased the participants’ reported confidence levels when confronted with an obstetric emergency at a later date.

This two-phase descriptive study used a mixed method approach. Phase one involved completion of a C Scale confidence questionnaire before and after the study day. In Phase two, the C Scale confidence questionnaire was repeated and ten participants were selected for interview. Participants were recruited from three study days over a six-month period. Thirty-eight of the 39 participants consented to take part: nine (23%) were doctors, twenty-six (67%) Registered Nurses and three (10%) Anaesthetic Technicians.

Results from this research shows that the participants reported a significant increase in confidence (p<0.005) following the HER-Obs study day and this confidence was maintained for up to 8 months. Thematic analysis of free text comments and interviews identified confidence relied on
good teamwork and communication, strong leadership and the presence and support from the midwife. Participants identified the need to maintain ongoing obstetric emergency training as knowledge diminished over time. These findings support current literature in emergency training.
Acknowledgements

I am indebted to my supervisors, Professor Sandra Carr and Dr Catherine Ward. Your support, guidance and “gentle nudges” were appreciated in order for me to complete the whole Masters journey. Catherine, without your enthusiasm for research and encouragement to share the work in midwifery education that has been achieved at the hospital, I might not have done it. Thank you. I also thank Dr Zarrin Siddiqui who commenced this journey with me.

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I dedicate this work to two very special people – my beautiful mum Jean and grandad John. I know you have been watching over me from above and would be proud of me.
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<table>
<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
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<tr>
<td>DR</td>
<td>Doctor</td>
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<tr>
<td>AT</td>
<td>Anaesthetic Technician</td>
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<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
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<td>ED</td>
<td>Emergency Department</td>
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<td>OT</td>
<td>Operating Theatre</td>
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<td>HER-Obs</td>
<td>Hospital Emergency Response – Obstetrics</td>
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<tr>
<td>UWA</td>
<td>University of Western Australia</td>
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<tr>
<td>SMHS</td>
<td>South Metropolitan Health Service</td>
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<tr>
<td>EMHS</td>
<td>East Metropolitan Health Service</td>
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<tr>
<td>PPH</td>
<td>Post-partum haemorrhage</td>
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<td>PE</td>
<td>Pre-Eclampsia</td>
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<tr>
<td>AFE</td>
<td>Amniotic fluid embolism</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>STAR</td>
<td>Supporting those at risk</td>
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<tr>
<td>MGP</td>
<td>Midwifery Group Practice</td>
</tr>
<tr>
<td>AAU</td>
<td>Antenatal Assessment Unit</td>
</tr>
<tr>
<td>RCA</td>
<td>Root cause analysis</td>
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<tr>
<td>NSQHS</td>
<td>National Safety and Quality Health Service Standards</td>
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<tr>
<td>C Scale</td>
<td>Confidence Scale</td>
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<tr>
<td>GRM</td>
<td>Gibb’s reflective Model</td>
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<td>IBM</td>
<td>International Business Machines</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package of Social Sciences</td>
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<td>WA</td>
<td>Western Australia</td>
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<tr>
<td>APGAR</td>
<td>A practical scoring method of evaluating the physical condition of a newborn infant shortly after birth.</td>
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Glossary

**Registered Nurse:**
A nurse registered with the Australian Nursing and Midwifery Board of Australia after completing a degree from a higher education institution or equivalent accredited program.

**Doctor:**
A medical practitioner working in the hospital in the Emergency Department or as an Anaesthetist in the Operating Theatre.

**Anaesthetic Technician:**
An allied healthcare worker who assists the Anaesthetist with the administration and monitoring of anaesthesia.
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1 Chapter 1 Introduction

1.1 Introduction

Education is a pivotal role of the health professional. Continued registration of the health professional is with the governing body. The Australian Health Practitioner Regulation Agency (AHPRA) requires evidence of ongoing education each year to stay abreast of the constant changes in knowledge and practice to ensure the health professionals deliver appropriate and safe care. In the hospital setting, the education department develops and provides professional development opportunities and resources to enable the staff meet their education requirements.

The researcher’s role as a Staff Development Educator in a general hospital involves planning, implementation, development and evaluation of education for staff employed at the hospital. Clinical staff (Doctors, Nurses and Anaesthetic Technicians) from the Emergency Department (ED), Operating Theatre (OT) and Intensive Care Unit (ICU) - are often the first line responders to an obstetric emergency if one occurs outside of the maternity unit. The majority of these staff have had minimal obstetric training. Investigation into obstetric emergency clinical incidents, and clinical staff requests for training in obstetric emergencies, identified a gap in knowledge. This led to the development of an obstetric emergency study day, the Hospital Emergency Response-Obstetrics (HER-Obs) study day, which is mentioned throughout this study, specifically for these aforementioned staff.

On completion of the HER-Obs study days, an evaluation of the training was undertaken. The evaluation form asked participants to comment on whether the study day was pitched at their level of understanding, provided them with further knowledge and skills to enhance their professional development and whether the presenters were knowledgeable and prepared. Whilst these evaluation summaries provided positive feedback indicating that the participants enjoyed
the study day, this feedback was not able to verify whether there was a change in practice in the clinical areas after attending the study day. Thus, it was decided to address this omission.

In preparation for this study, a literature search was performed using the University of Western Australia (UWA) electronic database Onesearch and access to journal articles via an alert system for articles under the topics of obstetrics and education through the South Metropolitan Health Service (SMHS) library. Guidelines, policies and other government or health documents were accessed via the East Metropolitan Health Service (EMHS) intranet. Other sources of literature included Google scholar, reports and theses. Reference lists of included articles were scrutinised to identify further studies that may have been of relevance to this study. Articles were screened for relevance by title and abstract prior to in depth review and inclusion in this study. Key words to guide the search included obstetric emergencies, simulation, teamwork and confidence. The bibliographic software program Endnote versions X7 and X8 were used to manage citations to format the references in this thesis.

1.2 Aim of the study

The aim of this study was to explore the influence of the attendance at the newly developed HER-Obs study day on participants’ reported confidence levels when confronted with an obstetric emergency at a later date.

1.3 Research question

The study was conducted to respond to the following research question:

Following attendance at the HER-Obs study day, will the participants report an increase in confidence when confronted with an obstetric emergency?

The researcher also explored factors that may have influenced that confidence. To address this, the aforementioned research question was broken down into the following parts:

- Did having experience with an obstetric emergency after the study day effect confidence?
• Did receiving further training after the study day influence confidence?
• Were there other factors that influenced confidence?
• Is the study day an effective way of increasing staff knowledge (and subsequent confidence)?

1.4 Significance of the study
Following the development and delivery of the HER-Obs study day, an evaluation was needed to explore how the study day fulfilled the learning outcomes. Evaluation is defined as a systematic process by which the worth or value of something, in this case, the study day, is judged.² Evaluation is a necessary and significant feature of education and a variety of approaches can be used. In this study, the Kirkpatrick and Kirkpatrick³ model of evaluation was used. This model of evaluation provides educators in many disciplines with a means of evaluating the effectiveness of education programs.⁴ Principally, it is important to ascertain if learning has occurred and if competence and confidence has increased for each participant. A review of the literature revealed only one study which had evaluated the effect of obstetric emergency training on staff who did not work within the maternity setting. An American study⁵ involved the administration of a 15 item survey to ascertain 212 Emergency Department (ED) resident doctors’ confidence and knowledge to manage obstetric emergencies. Results showed 56% of the participants considered they had experienced adequate exposure to obstetric emergencies but lacked confidence regarding obstetric conditions and had knowledge deficits. The researchers suggested that educational interventions may be of benefit to increase exposure to obstetric emergencies utilising simulation and web-based learning. This study however was limited by a small response rate of only 11.2% of the resident doctor cohort. As there were limited studies identified that evaluated the effect of obstetric emergency training on health professionals outside of the maternity setting, the intent of this research was therefore to address this deficit. This study has addressed this gap in the literature by investigating firstly, whether the development of the study
day was of benefit to the attendees and secondly, by identifying whether participants reported feeling more confident when confronted with a real obstetric emergency afterwards. An evaluation process assists to justify if offering the study day is of value to the hospital and if it ultimately improves the outcomes of the pregnant women and their babies.

Dissemination of the research findings will be by a report to the hospital in which the study day takes place. If the study day is considered to be of value, the program could be offered to other hospitals to address any training gaps of clinical staff outside of their obstetric units. It is envisaged that a paper will be submitted for publication in one of the reputable education, nursing or midwifery journals.

1.5 Organisation of the thesis

The thesis is organised into six chapters. Chapter one provides the aim of the study, the rationale and the research questions which guided the research study. Chapter two outlines the background to why the study day was developed, the models of maternity care and types of obstetric emergencies that may present at the hospital. Literature relevant to the study is presented in Chapter three, this includes; adult learning, reflective learning and published research of training-identifying the effect of the training in the context of self-efficacy, clinical emergencies, simulation, teamwork and communication. The research design and methodology and approach to data analyses is presented in Chapter four. This includes the setting for the research, the sampling and data collection techniques used, and the criteria for trustworthiness for the research. Chapter five presents the results and findings of the study, including demographic data, statistical analyses and emerging themes from the qualitative data. Chapter six discusses comparisons to the literature and highlighting where new knowledge has been added. It concludes by presenting the limitations and recommendations for future research.
2 Chapter 2 Background

2.1 Introduction

This chapter describes the background to why this study was conducted and the reasons why the study day was developed. The following discussion provides a background of the obstetric emergencies at the hospital where the study was undertaken and the role of the clinical staff responding to these emergencies. Discussed here is how the evaluation of the program was conducted and the pertinent outcomes in relation to clinical staff confidence when dealing with obstetric emergencies.

2.2 Obstetric emergencies

Obstetric emergencies are often unforeseen. It is imperative therefore that clinical staff who may encounter such an emergency are fully prepared to deal with a crisis situation. This factor has attracted serious consideration by the hospital for the following reasons. The past decade has seen a significant growth in the population within the hospital catchment area which resulted in an increase in birth numbers per year from 1214 in 2009 to over 2500 by 2015. Consequently, this growth in births increased the likelihood of obstetric emergencies. Thus, it was essential to ensure that clinical staff involved were confident to deal with any crisis situations. In 2010 the ICU was established and thereby enabled the management and care of higher acuity maternity cases more proficiently. Prior to opening of the ICU, women who presented with a serious condition such as a massive postpartum haemorrhage or severe pre-eclampsia, had to be transferred to a tertiary facility for effective management. This transfer of care, whilst essential for the well-being of the women and/or fetus, could result in an increase in risk due to the time to travel from the hospital to the tertiary centre. This journey takes approximately 30 minutes which in effect delays the required management.
Midwives and obstetricians are experienced in managing adverse obstetric situations since it is incumbent in their roles and included in their mandatory training. However, clinical staff within the ED, OT and ICU are not so prepared, yet they are often expected to attend and effectively deal with such emergencies. Recognition of serious illness can be challenging in any situation. Pregnant women are usually younger and fitter than the general medical patient cohort. However, the physiological adaptations of pregnancy can mask deterioration and conceal complications. Awareness of early warning signs of a possible complication is essential to improve detection and avoid unnecessary delays in effective management.  

There are several obstetric emergencies which necessitate prompt diagnosis and intervention to avert the potential of a life-threatening situation. Each situation can manifest differently, therefore knowledge of such emergencies ensures competent management of the woman presenting with such a condition.

O’Gorman and Penna\textsuperscript{7} (page 115) state: “the prompt and correct management of women who collapse in pregnancy and the puerperium is likely to have contributed to the significant reduction in deaths in pregnancy seen in the last 10 years”. This observation is most significant since many deaths are avoidable.\textsuperscript{8} In addition to recognising the cause of an obstetric emergency and providing prompt competent treatment, first responders must be aware of the how pregnancy can affect body systems. As previously mentioned, often these first responders are not obstetric trained staff. Significant physiological changes involve the major systems within the body and can have a direct influence on how maternal collapse is managed. Complex physiological changes occur in pregnancy which can accelerate the development of hypoxia and acidosis and make ventilation more difficult. Cardiovascular changes also instigate rapid blood loss and a reduced oxygen carrying capacity. From 20 weeks gestation, the pressure on the inferior vena cava and the aorta from the gravid uterus can be relieved by positioning the woman in a left lateral tilt. If there is no response to correctly performed cardio pulmonary resuscitation within four minutes of
maternal collapse or if resuscitation is to be continued, a perimortem caesarean section within five minutes of maternal collapse increases the chances of survival for the baby. However, the primary intent of resuscitation is to improve venous return and cardiac output to save the mother.  

Post-Partum Haemorrhage (PPH) is blood loss greater than 500ml or any amount that compromises the woman’s health. Blood loss is rapid, therefore all personnel involved in the management must be fully aware of their exact role and responsibilities to avoid a disastrous outcome. A six-month audit of 2773 live births conducted at a local tertiary hospital using the World Health Organisation (WHO) near miss criteria to identify cases of severe maternal morbidity, identified that PPH was the most common cause of maternal near miss.

Pre-Eclampsia (PE) is a multi-system disorder, which can adversely affect both the mother and the fetus. The aforementioned local audit stated that whilst the incidence of PE has reduced over the last decade, morbidity, in particular eclampsia, has not substantially reduced. Manifestation of symptoms can be either slow or rapid onset, therefore proficient antenatal care is paramount. This disorder can lead to long term morbidities and accounts for a substantial proportion of maternal mortality. Symptoms may appear similar to common antenatal complaints such as heartburn and nausea, frontal headache and epigastric pain. If a woman presents to ED with these symptoms, it is essential that exact diagnosis is made to prevent the catastrophic event of undiagnosed early onset PE. In addition to the variety of ways in which PE may present, the required drugs or drug regimes are also unfamiliar to the non-obstetrician therefore further hinder prompt and effective emergency management.

In relation to the cardio pulmonary systems, pulmonary embolism is a leading direct cause of maternal death. As well as thrombophilia and a previous history of venous thromboembolism; obesity, age greater than 35 years and caesarean section contribute substantially to the risk of pulmonary embolism for the woman. Cardiac disease is the most common overall cause of
maternal death and the majority of deaths are secondary to cardiac causes occurring in women with no previous history. The main causes are myocardial infarction, aortic dissection and cardiomyopathy.\textsuperscript{9}

Sepsis in pregnancy can also result in maternal death. Early recognition and treatment of severe sepsis is vital. However, the signs and symptoms in pregnant women may be less distinct and not necessarily present in all cases. Thus, cases can be overlooked or missed. Also, disease progression may be much more rapid.\textsuperscript{14}

Amniotic fluid embolism (AFE) is a rare but potentially lethal condition. The typical presentation is the collapse of a woman from sudden hypoxia and hypotension, followed by coagulopathy. Seventy percent of cases occur during labour but may also follow a vaginal birth or caesarean delivery.\textsuperscript{15}

Obesity in pregnancy is now a common risk and brings with it a series of problems. Compared to a pregnant woman with a normal body mass index, obese pregnant women have a small but statistically significant increased risk of severe morbidity. These risks include haemorrhage requiring transfusion, serious cardiac, respiratory, cerebrovascular or haematologic complications. They are also at higher risk of venous thrombosis / embolism, sepsis, shock, hepatic and renal failure, anaesthetic-related complications and uterine rupture.\textsuperscript{16}

Optimum care to improve outcomes are the priority of the health care system but to achieve this, strategies must be in place to identify those women at risk and reduce morbidity and mortality.

2.3 Obstetric care at the hospital

Woman who choose to birth at the hospital have several options of care depending on their needs and circumstances. Women may self-refer to the antenatal clinic or have a referral made on their behalf by their own General Practitioner (GP). The majority of the women booked into the hospital receive their antenatal care through the antenatal clinic with regular appointment
schedules to see the midwives and doctors. The antenatal system is designed to identify those women at risk, however as previously stated, sometimes incidences occur which cannot be predicted. To assist in the identification of risk factors, there are several options of antenatal care offered. For example, the Supporting Those at Risk (STAR) clinic. This clinic is for women with complex social histories, adolescent pregnancies or women with a known illicit drug taking history. Women with a very high-risk pregnancy due to medical complications such as a cardiac condition or insulin dependent diabetes, or women with high levels of illicit drug dependency are referred for antenatal management at a tertiary hospital. Another option is the Midwifery Group Practice (MGP) which involves a small team of midwives and one doctor providing continuity of care with evidenced benefits to the woman and baby. Within this framework is the Boodgari Yorgas program\textsuperscript{17} which provides holistic and culturally appropriate maternity and postnatal care services for aboriginal mothers and family. Research has shown that the benefits of continuity of care models include a reduced risk of pre-term birth, increased maternal satisfaction and lower caesarean section rates.\textsuperscript{18-20} Alternatively, women can elect to receive their antenatal care from their own GP. Women receiving antenatal care and booked to give birth at the hospital will be referred for closer monitoring by the Specialist Obstetricians if they have or develop risk factors such as a history of pre-eclampsia, previous caesarean section birth or blood abnormalities.

If complications or concerns should arise in relation to the health of the woman and/or fetus, the woman will be admitted to the Antenatal Assessment Unit (AAU) for review and assessment. In this unit, women are assessed and managed by obstetricians and midwives who are experienced in recognising and responding to an obstetric emergency.

Nevertheless, regardless of the different levels of antenatal care, there are situations which occur unexpectedly and require immediate intervention. Often these women may present to the ED. Thus, to provide first line care, ED staff must be equipped to differentiate between a serious condition pertinent to pregnancy and a minor discomfort. For example; symptoms of pre-
Eclampsia may mimic a gastro-intestinal upset, the woman may have experienced a trauma such as a car accident or arrive by ambulance in labour or bleeding vaginally. Whilst the doctors and nurses in the ED are highly skilled to deal with complex cases, few have obstetric training. Delay in diagnosis and initiating the correct intervention or treatment could be severely detrimental to the mother and/or fetus.

The OT staff are also involved in front line management of obstetric cases. Often maternity patients require an unplanned procedure in the OT, for example, an emergency caesarean section or retained placenta. A post-partum haemorrhage is more likely to occur following an emergency caesarean section; however, a scheduled elective caesarean section does not preclude such an event. Pregnant women with pre-eclampsia may require an operative delivery, exposing the theatre staff to potential involvement in an eclamptic emergency situation.

2.4 Obstetric emergency training

The obstetric team, which includes obstetricians, doctors and midwives receive comprehensive training and regularly attend mandatory updates to ensure all involved maintain the level of competence to effectively manage obstetric emergencies.

The mandatory training for the obstetric team at the hospital is the Interdisciplinary Teamwork in the Management of Emergencies (INTIME) course. This one-day course includes theory and simulation scenarios. This course was first developed at a tertiary hospital in Perth, Western Australia and is now available in both metropolitan hospitals and rural areas within the state.21 Prior to attending the program, participants are expected to complete the necessary pre reading and there is also an assumption of knowledge and practice. The attendees work together in three teams consisting of doctors and midwives. Involvement of small multidisciplinary teams to initiate cohesive teamwork which reflects the importance of clinical skills.22 Initially, the INTIME course was limited to the clinical staff working within the maternity unit. However, as previously
mentioned, many pregnant women present to the ED in crisis and often the ED clinical staff are not obstetrically competent. If the recognition and treatment of an obstetric emergency is delayed, the outcome could be catastrophic for the woman or fetus. Root cause analysis (RCA) of obstetric clinical incidents at the hospital identified that the ED staff required the essential education to enable the recognition of symptoms and the awareness to alert the obstetric team to initiate the appropriate management. As the OT and ICU clinical staff can also be involved in the management of obstetric emergencies, they too were invited to attend. It is essential that all individuals who care for a pregnant woman receive the necessary training to recognise and respond to an obstetric emergency.

Attendance of clinical staff from these areas identified the following two issues: Firstly, the course assumes a knowledge and practice level in obstetrics, and secondly, as the course has a strong emphasis on teamwork and communication, ideally participants from the same work area are assigned to the same team. Taking these issues into consideration, it was decided to develop a new program which would integrate the aforementioned factors, namely the Hospital Emergency Response - Obstetrics (HER-Obs) study day. This study day was adapted from the INTIME course and designed specifically for non-obstetric clinical staff. Whilst obstetric emergency education is available throughout the metropolitan and rural hospitals, to the researcher’s knowledge, this is a unique program as there is no similar course specifically for non-obstetric clinical staff available in Western Australia (WA).

2.5 Details of the study day

This study day was developed by the researcher, a Staff Development Educator. The researcher was also the facilitator of all three study days. Faculty included Staff Development Midwives, an Obstetrician and an Anaesthetist. The program included three essential components; firstly, a theoretical component pitched at a level to reflect the participants’ current knowledge and skills, secondly, appropriate simulation scenarios to engender cohesive teams of doctors and nurses
from each department (ICU, OT and ED) emphasising the importance of teamwork and communication – essential in any emergency situation. The third component was debriefing and reflection. Facilitated discussions enabled the participants to reflect and learn from their role during the simulation scenarios and at workshops. The outcomes for the study day are that participants will:

- Be able to recognise the clinical signs of an obstetric emergency;
- Have the ability to provide first line management of an obstetric emergency;
- Be aware of the escalation of care pathway;
- Understand the importance of multi-disciplinary teamwork and communication;
- Be able to provide safe, consistent and effective emergency management to the pregnant, intrapartum or post-partum women - which will endeavour to improve the outcomes for mothers and babies.

(See Appendix One for study day program).

Prior to attending the study day, registered participants are sent a pre-reading package which emphasises the theory of the obstetric emergencies, teamwork, communication and the hospital clinical guidelines for obstetric emergency management. This package ensures that the participants have some background knowledge. Participants are informed that on the day they will be reviewing case studies, having group discussions and participating in simulated scenarios.

The participants are allocated to teams consisting of senior and junior doctors and registered nurses from their own department. This team structure reflects how it would occur within the department during a real emergency situation.

Interprofessional learning is defined as: the occasions when two or more professions learn from and about each other to improve collaboration and the quality of care. Essentially the learning should focus on real practice situations and reflect local issues, structures and service delivery.23

In a simulation scenario, each team are presented with a critical emergency scenario which has to
be effectively resolved, thereby safeguarding the welfare of the mother and fetus (See Appendix two). These scenarios are based on real life scenarios and have a strong emphasis on teamwork and communication; a vital element in any emergency situation. In this case, the purpose is to escalate the care of the woman and fetus to the appropriate experts by initiating an obstetric emergency code.

Prior to the scenarios, the participants engage in workshops to discuss a particular obstetric emergency. This may include case study presentations or group discussions. These sessions are facilitated by a member of the faculty; obstetrician, anaesthetist or midwife.

Following the development and delivery of the HER-Obs study day, an evaluation was needed to determine if the program had achieved what it had been designed to do. Evaluation is a necessary and significant feature of education and a variety of approaches can be used. Principally, it is important to ascertain if learning has occurred and that competence and confidence has increased for each team member.24

2.6 Conclusion

This chapter describes the background as to why and how the HER-Obs study day was designed. Principally the course was developed to address an identified gap in obstetric emergency training at the hospital in which the study took place. Also discussed were the models of maternity care provided to pregnant women planning to birth at the hospital and a description of the types of obstetric emergencies that may present at the hospital. It explains how recognition and quick response to such emergencies is paramount for the safety of the mother and fetus, and that it may depend on the knowledge and confidence of clinical staff outside of the maternity unit to do this. This research evaluates whether the study day does give participants confidence in such an event. The following chapter presents a review of the literature and the theoretical basis of the research.
3 Chapter 3 Literature Review

3.1 Introduction

This chapter presents a targeted review of the literature related to the evaluation of the HER-Obs study day for staff confidence in obstetric emergencies. Evidence based education is pivotal to the provision of quality care and to determine its worth, evaluation must be conducted. The focus of the literature review was to explore the research related to training and education for obstetric and other emergency management and the behavioural characteristics required by personnel involved in emergency situations. The key words used to conduct the search included obstetric emergency, simulation, teamwork and confidence. Results of the review are identified under the sub headings below.

3.2 Adult learning theory – existing knowledge

In the past 30 years there has been a plethora of research by behavioural scientists and educationalists to explain how adults learn. It is recognised that adults learn differently from children. With the drive toward life-long learning, especially through professional education, it is useful to explore these differences more closely. Researchers such as Steven Brookfield and Malcolm Knowles have identified five primary principles for adult learning. These principles are that adults:

1) Must self-direct their own learning;
2) Must have opportunities for critical reflection when learning something new;
3) Must be able to access their own experiences when learning something new. Additionally, adults will need new experiences in order for learning to “stick”;
4) Need a purpose for learning. There must be a goal or outcome, as most adults will not learn...
for the sake of learning;

5) Must learn to learn.

These principles apply to the HER-Obs obstetric emergency management training. The participants take responsibility to self-register, attend and participate in the activities of the study day. Many attendees have not had much - if any, obstetric emergency training as part of their nursing or medical careers and therefore are not familiar or confident to deal with such an emergency.

Rogers and Horrocks \(^{27}\) state that attendees will come to the study day with their own desired outcomes and they will take from the study day what they want (Figure 3-1). This means that the intended outcomes of the study day may vary for the attendees from those planned by the facilitators. Therefore, at the beginning of the study day, as well as identifying the learning outcomes of the day from the facilitators’ perspective, the attendees are asked for their individual outcomes. These are listed and revisited at the end of the day to check if these outcomes have been covered.

![Figure 3-1 Rogers and Horrocks’ (2010) relationship between teachers and students’ goals.](Adapted from: Rogers, A; Horrocks, N. 2010 Teaching Adults 4th Ed. McGraw-Hill Education.)
Adults learn in different ways and as such, different methods of facilitating this learning can be used. Methods can be divided into four main categories:\(^\text{27}\)

- Presentation methods (facilitator activities such as demonstration, use of whiteboard, audio-visual or PowerPoint;
- Participatory (interaction between facilitator and learner such as questions, discussion or group work;
- Discovery (learners work on tasks to learn and discover knowledge for themselves through practice, experiments, reading, writing);
- Evaluatory (techniques used to evaluate the learning already done such as tests, quizzes, role play).

Adult learning styles are also taken into consideration. Kolb’s learning style inventory is the most frequently used to assess adult learning styles.\(^\text{28}\) Kolb’s learning styles are: Converger, diverger, assimilator and accommodator. He identifies four types of learning within the styles; these are: concrete experience (feeling), reflective observation (watching), abstract conceptualization (thinking) and active experimentation (doing).\(^\text{29}\)

Considerable research has been undertaken to study the effectiveness of different education interventions on adult learning. Research has shown that the traditional passive, non-interactive teaching methods have minimal effect on the behaviour of health practitioners and no discernible effect on clinical outcomes.\(^\text{28}\) A Canadian exploratory study involving 201 management undergraduate students examined the relationships between Kolb’s learning styles, learning types and learning preferences by using Kolb’s learning styles inventory (LSI) and the researcher’s new 12 item learning preference measure. Results revealed that there were differences in learning preferences within the different learning styles. Findings recommended that educators use a variety of learning methods and encourage students to be receptive to all methods rather than try to link specific learning methods to the learning styles of the group.\(^\text{29}\) Another non-
experimental study at an American university used a version of Kolb’s LSI to identify the learning style preferences of 89 health care professional students (nurses, physician assistants, occupational therapists, speech pathologists and physical therapists). This study identified that most groups had similar learning styles except the physical therapists who had a tendency towards active experimentation. The study suggested that understanding and incorporating learning styles into health care education could have a positive impact not only on teaching and learning but also on the effectiveness of interprofessional team interaction.

Bowman (2009) developed a learner-centered and interactive approach to adult education. This approach conveys that teacher-centered and lecture-based training sessions are a thing of the past and identified the four C’s to planning education sessions; these are:

- Connections – learners make connections to what they already know, and connections to what they will learn or want to learn during a training session;
- Concepts – the direct instruction part of the session which can be multi-sensory using hearing, seeing, writing, reflecting or participating;
- Concrete – learners have the opportunity to practice a skill using the new information;
- Conclusion – learners summarise what they have learned, evaluate the learning and commit to use the new knowledge or skill later.

Understanding of adult learning principles is important for educators to facilitate effective teaching and achieve the outcomes required. All the adult learning principles discussed above were considered when planning the HER-Obs study day. Discussions about the learning outcomes occurred from the facilitators’ and participants’ perspectives. Workshops and discussions about the different obstetric emergencies were followed by participation in simulated scenarios. At the end of the day, the learning outcomes were revisited to ensure participants learning needs were met. The program was revised after each study day to ensure that the content and delivery methods met the learning needs of the participants and the organisation’s requirements. This
study evaluates whether these principles have been effective in achieving the desired outcomes by assessing against the Kirkpatrick and Kirkpatrick first three levels of evaluation\(^3\) – as discussed in Chapter four.

### 3.3 Learning by reflection

Reflective practice forms the basis of deep learning from past experiences. It helps develop critical thinking, problem solving and self-directed learning skills through gaining new understandings, new perspectives and new alternatives for future experiences.\(^{32}\) It has the potential to help health care practitioners in all fields to use the tacit knowledge and understanding that they have of their practice and use this to generate knowledge for their practice in the future.\(^{33}\)

Reflective practice has been developed in education for over 100 years. John Dewey first wrote about reflective practice for teachers in 1910. Over the years, several other key educators such as Schon, Boud et al and Kolb have developed the theory of reflective practice.\(^{32}\) Within this century, Mezirow described the epistemology of transformative learning whereby the adult educator must help learners understand how their own beliefs, values and judgements influence their learning and how to acquire the skills, sensitivities and understandings. These elements are essential to become critically reflective of assumptions and to be able to participate more fully and freely in critical – dialectical discourse.\(^{34}\)

A cross-sectional descriptive study of 98 final year Diploma of Nursing students in Malaysia examined the perceptions of the students towards reflective practice to determine if it was useful for learning. Results showed that reflection encouraged critical thinking. Eighty four percent of the participants reported that it encouraged them to make a conscious effort to identify and learn from what was happening. Furthermore, 74% of these participants were able to apply the appropriate theory into practice through reflection.\(^{35}\) Similarly, a qualitative study\(^{36}\) using inductive thematic analysis of semi-structured interviews of undergraduate medical students, tutors and educators in the United Kingdom, investigated the understanding and experience of
the participants in respect to reflection in medical education. Results found that the participants acknowledged the importance of reflection to the profession and that it defined their learning needs. Also identified was a need for greater emphasis on reflection as the participants had received little or no formal training or education in reflection and had an incomplete understanding of it. Results suggested the need for reflection to be incorporated early in to the medical education program and to value reflective practice as a core professional skill. Reflective practice was also found to be an effective learning tool in Post Graduate education. A survey\textsuperscript{37} in the USA to examine the perceptions of Graduate Nurses and faculty regarding the learning outcomes associated with using reflective learning journals as part of online learning education, supported the use of reflective practice. Results showed that it reinforced course objectives and promoted understanding of new information. Ninety four percent of graduates and 80\% of faculty stated it assisted the integration of new ideas. Also, 88\% of graduates and 100\% of faculty felt it facilitated personal strengths and weaknesses; however, only 72\% agreed it facilitated development of coping skills needed to counter frustration, anger or to decrease stress.

3.4 Self-efficacy

Self-efficacy is an individual’s belief in one’s capacity to organise and execute the action required to manage a situation\textsuperscript{38} in simplistic terms, one’s level of confidence. A mixed method study by Curran et al.\textsuperscript{38} investigated the retention of resuscitation skills and performance amongst 28 health care professionals (medicine, nursing, respiratory therapy and paramedicine). Findings from this study showed that little attention has been directed at the impact of self-efficacy in relation to resuscitation skills, deterioration of the patient and the health care worker’s confidence to perform. Resuscitation events can be extremely anxiety provoking. If a person is not confident the application of knowledge and skills needed during a resuscitation, may significantly affect the level of self-efficacy. Ultimately, an obstetric emergency may also provoke such a reaction and such a situation could be detrimental to the health and outcomes for the mother and/or fetus/baby.
Previous studies have investigated the level of confidence in practice following a teaching course, however, only a few of these studies addressed obstetric emergencies. A study by Green et al.\textsuperscript{39} based in the USA involved 67 Registered Nurses, used pre and post intervention surveys to measure perceived confidence and compliance in maternal resuscitation before and after acute life support certification in combination with obstetric emergency drills. The results showed a 35% increase in confidence after the course; however, the researchers did not explore whether the results were sustained in practice. Findings from other studies\textsuperscript{40-48} also showed an increase in confidence following various training programs which included simulation and theory. Again, these surveys only focused on the participants’ confidence levels before and immediately following the training, not in practice. An English study\textsuperscript{49} explored the confidence of 43 junior doctor following small group training for emergency procedures. The researchers repeated the confidence questionnaire at three months after the course and found that the increase in confidence was sustained. However, a small but significant fall in confidence between the post course and three- month results occurred for the techniques least performed. It is unlikely that staff attending the HER-Obs day will encounter an obstetric emergency on a regular basis so these research results are significant to this present study. An evaluation of 219 nurses, physicians and allied health staff who attended the English SPRINT\textsuperscript{50} multi-disciplinary team insitu simulation program found that repeated exposure to simulation training was most beneficial to crisis resource management. However, simple isolated emergency exposure may not be sufficient. Comparison between traditional teaching methods - such as group discussions and case study reviews, and simulation showed there was no difference in confidence levels from either teaching method.\textsuperscript{51}

3.5 Clinical emergency training

Including the INTIME course previously mentioned, there are other courses similar to HER-Obs in Australia. The Advanced Life Support in Obstetrics (ALSO) course offers training around the country and overseas for health practitioners to develop and maintain knowledge and skills in the
management of obstetric emergencies. The ALSO course combines lectures and skills and emphasises the importance of interdisciplinary teamwork in obstetric emergencies. The course has two parts: Part one, Preparation in maternity safety is a two- day course suitable for doctors and nurses with limited experience in midwifery and obstetrics. Included is the management of a normal birth and psycho social health. However, the program is not aimed at health professionals who work outside of the maternity units. Part two is also a two- day course and is designed for health practitioners with at least two years of midwifery or obstetric experience. Another training package is the Practical Obstetric Multi-Professional Training (PROMPT) course. This program is offered globally and throughout Australia. PROMPT stresses the importance of effective interprofessional training and states that this training improves both teamwork and clinical outcomes. In 2014, a retrospective cohort study of staff in eight maternity units in Victoria, Australia found that after implementing the PROMPT training there were significant improvements in organisational culture in obstetric emergencies and in the clinical outcomes for the neonate. Another course available is the Multidisciplinary Obstetric Simulated Emergency Scenarios (MOSES) program. This is a simulation- based interprofessional continuing education program designed to enhance non- technical skills amongst obstetric teams and hence improve patient safety. Evaluation of the MOSES course determined that this forum of education is a positive learning environment as it can enhance communication and leadership skills in crisis situations. However, the results did not demonstrate whether these skills transferred fully into the clinical setting. The Fetal welfare, Obstetric emergency, neonatal training course (FONT) from New South Wales, Australia, is an interprofessional course. Obstetricians, General practitioners and Midwives were trained to provide FONT training in their hospitals. A study using a pre-test post-test method into the effectiveness of its aim of improving clinicians’ understanding of fetal heart rate (FHR) pattern interpretation and neonatal outcomes, showed that in a six year period after implementation of the training there was a 77% improvement in clinicians use of a common language for reporting FHR decelerations and a 35% improvement in identification of a
normal FHR pattern. This study identified the benefits of interprofessional education and subsequent improvement in neonatal outcomes.56

3.6 Simulation training

There is a plethora of literature which provides evidence that teaching procedural skills in a simulated environment improves confidence and technical ability.57 Furthermore, simulation can also improve learning, help learners to deal with anticipated medical events, develop teamwork and communication skills and improve performance.58-60 Beyond knowledge and dexterity, healthcare workers need to learn appropriate judgment, behaviour and attitudes. These essential skills include the ability to work in multidisciplinary teams, work under stress, make decisions with limited information, advocate for patients, know when to delegate and when to take control.61 These essential principles are incorporated into the HER-Obs study day.

A review of the current literature in relation to simulation training revealed many articles and studies which have discussed and explored the value of simulation within medicine, nursing and midwifery. Simulation allows learning to occur in a risk free environment, giving the participants permission to fail, learn from their mistakes and importantly decrease stress – which is a known barrier to learning.62 Preliminary data suggests that retention of knowledge and skills is increased with simulation than by passive or didactic teaching methods.63 However, the focus of this research was primarily directed toward the effect on teamwork, communication and skills. Lewis62 stated that beyond the initial “smile sheet” participants must feel that they have benefitted personally from the training. Participants should feel that personal worth; including psychological factors and other senses which have been enhanced by the training. The STORC safety initiative64 – a multicentre survey from the USA involving 614 clinical staff which explored preparedness and confidence in obstetric emergencies, found that more than 84% of staff felt that emergency drills and simulation team training would increase their confidence and performance.
3.7 Teamwork and communication

It is well documented that failure in communication during medical and other emergencies is the leading cause of avoidable adverse events. Within healthcare provision, a significant percentage of errors can be attributed to communication breakdowns and lack of effective teamwork. Thus, communication breakdowns and teamwork failures are a major contributing factor attributing to 70% of hospital sentinel events.63

The Canadian Safety Institute65 conducted a meta-analysis of training programs, models and tools used in healthcare. Explored were team training and organisational changes as interventions to enhance communication and teamwork by grounding these processes in theory. Results showed that current healthcare training in general does not address the generic or non-technical skills such as communication, situational awareness, decision-making and teamwork that underpin technical skills. Improvement in teamwork and communication contribute to a culture of patient safety. This review determined that improvement in theory development in relation to the constructs of teamwork and team effectiveness for healthcare was required. The majority of emergency training courses are based on crew response management derived from the aviation industry which is not directly transferable to the healthcare industry. Furthermore, there is insufficient theory on the framework of patient safety culture and how to achieve such a culture.

A review66 of 137 English language studies between the years of 1980 – 2009 into the definition of safety culture in healthcare found that the most commonly used definition was from the Health and Safety Commission.67 This definition being:

The product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety programmes. Organisations with a positive safety culture are characterised by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measure.
In addition, this review also determined that safety culture is multidimensional. In most cases, researchers and organisations adopt a model of safety culture that features several dimensions, for example:

- Leadership commitment to safety;
- Open communication founded on trust;
- Organizational learning;
- A non-punitive approach to event reporting and analysis;
- Teamwork;
- Shared belief in the importance of safety.

Essentially, improvements in safety culture were accomplished by implementing multifaceted interventions, targeting more than one dimension of safety culture at a time.

The Australian Commission on Safety and Quality in health care leads and coordinates improvements in areas relating to safety and quality in health care across Australia. It developed the National Safety and Quality Health Service Standards (NSQHS). One of the standards is NSQHS 6 – Communicating for Safety. This standard specifically addresses the importance of clear and concise communication and the transfer of responsibility within patient care. In order for the hospital to meet accreditation standards, it is important that staff communicate using the principles set out within the standard. The HER-Obs course incorporates these crucial principles during a teamwork and communication discussion as well as part of every simulation scenario.

A retrospective comparison of pre and post obstetric emergency training for doctors and midwives in rural WA by Maouris et al examined data from 127,753 births for neonatal and obstetric outcomes. Results showed a significant reduction in low five-minute APGAR scores and a trend for improvement in all other outcomes for example, a reduced caesarean section rate after the training. The authors stated that the quality of obstetric care depends primarily on how well
midwives and doctors function together as a team and that involving them in drills is the best way to improve teamwork.

Siassakos et al. (2009)70 used a mixed method approach involving 24 doctors and midwives who participated in simulated obstetric emergency drills to determine whether the teams receiving specific teamwork behaviour training demonstrated improved communication during the drills. The researchers concluded that the tasks were more likely to be acknowledged and performed within the teams who received the extra training because they used more directed commands.

In regard to teamwork, a qualitative study by Bristowe71 using interprofessional focus groups of 33 doctors, midwives and healthcare workers, found that optimal teamwork was dependant on good leadership and the availability of experienced staff. In England where clinical team training is embedded in practice, team training was shown to be associated with improvements in clinical processes and outcomes. The need to improve understanding of teamwork in medical emergencies has been recognised not least because of the risk of adverse outcomes, complaints and litigations. Whilst it was suggested that the availability of large print algorithms in clinical areas may reduce the reliance on recall in the heat of an emergency, it was ascertained that clear leadership and effective team communication was particularly valuable - especially if the emergency did not fit into well-known emergency algorithms. The findings from these studies suggest that teamwork and communication form a vital focus of training in medical emergencies.

3.8 Summary

This chapter presented the current literature related to this present study. Discussed was the consideration of adult education and learning principles and strategies. Identified were the importance of reflective learning in clinical practice and how confidence can be improved after training. Confidence to manage an obstetric emergency is essential for the wellbeing of the mother and baby. Reflective practice was incorporated in the study day. At the end of each simulation scenario, a debrief session was held whereby the participants could reflect on their
individual actions as well as those of the team. Critical thinking was included in each of the workshops. Participants were encouraged to draw on previous experiences with obstetric emergencies and engage in facilitator led group discussions to identify lessons learnt and identify gaps in knowledge.

It identified the importance of teamwork, communication and clear leadership in emergency situations. The HER-Obs study day embeds these principles into all aspects of the program to enhance the safety culture of the staff. The ultimate goal is to identify risk factors, provide optimum care for the pregnant, intrapartum and postpartum women, foetus / baby and ultimately reduce the morbidity and mortality of the women who present to the hospital. Also, this review outlined obstetric emergency training courses that are provided globally and within WA and research findings from analysis of some of these training programs. Chapter four will describe the methodology used in this research study.
4 Chapter 4 Methodology

This chapter presents a description of the study design, the research questions to be addressed and the methodology used to collect and analyse the data. Also included is a description of the sample group and ethical considerations.

4.1 Aim of the study:

The aim of this study was to explore the influence of the attendance at the newly developed Hospital Emergency Response – Obstetrics (HER-Obs) study day on participants’ reported confidence levels when confronted with an obstetric emergency at a later date.

To this end, the following research question was addressed:

- Following attendance at the HER-Obs study day, will the participants report an increase in confidence when confronted with an obstetric emergency?

The researcher also explored factors that may have influenced that confidence. To address this, the aforementioned research question was broken down into the following parts:

- Did having experience with an obstetric emergency after the study day affect confidence?
- Did receiving further training after the study day influence confidence?
- Were there other factors that influenced confidence?
- Is the study day an effective way of increasing staff knowledge (and subsequent confidence)?

4.2 Design of study:

This two-phase descriptive study used a mixed methods approach. Over time much discussion has been generated as to whether qualitative or quantitative are best suited to respond to particular research questions. Research has shown that both methodologies are important and useful. 72
Tashakkori and Teddlie (1998) stated that within social and behavioural sciences, research questions are best explored using a mixed methods approach rather than reliance on either qualitative or quantitative methods. Furthermore, a mixed method approach is not to replace either method but to draw on the strengths and minimise the weaknesses of both. The strengths and weaknesses of both quantitative and qualitative approaches are well known and strengths and weaknesses exist in a mixed method design. A strength includes the collection of narratives which enhances meaning to numbers. Conversely, numbers can add precision to words and narrative, and provide fuller, deeper and more meaningful answers to a single research question. This approach also provides stronger evidence for a conclusion through convergence and corroboration of findings – this is the principle of triangulation. In contrast, some researchers contend that the theoretical underpinnings of qualitative and quantitative research are basically incompatible. Others, however, promote that this approach can enrich the research outcomes and provide a more complete picture of the research problem.

Taking a mixed method position allows researchers to mix and match design components to offer the best chance of answering their specific research questions. Mixed method research can be designed in two ways:

Firstly, whereby different stages of the research utilise different paradigms. For example; having separate quantitative and qualitative phases. This is known as a sequential design.

Secondly, a concurrent design mixes qualitative and quantitative methodology within each phase of the research. Both phases of this research had quantitative and qualitative methodology. A concurrent design was used for this study as shown below (Figure 4-1).
The present study assessed the characteristics of individual subjects, groups and situations at a specific point in time. There was no attempt to determine cause and effect. The primary reasons for considering this approach were to identify any areas which may require further exploration, to assist if further resources were required to enhance the situations and finally, to provide further clarification about the situation being studied. These three factors are pertinent to health care provision, education and this present investigation.

Kirkpatrick and Kirkpatrick’s four stage model of evaluation was the theoretical framework used for the data collection process. Developed in 1959, origins were in the business sector. Since then it has been used in other disciplines including education. Kirkpatrick strongly suggested that educators take steps to ensure that the training delivered actually achieves its aim, meets the needs of the stakeholders and is delivered in the most effective way to meet the needs of individual members/participants. This model of evaluation has continued to evolve and provide educators in many disciplines with a means of evaluating the effectiveness of education programs. Phillips added a fifth level – Return on investment (ROI) – which assesses the cost/
benefit of the training undertaken. In recent years, the Kirkpatrick model adopted a similar fifth level which was named Return on Expectations (ROE). This level relates to focusing training and reinforcement efforts on the stated bottom-line expectations of the organisation, with the goal of delivering the key outcomes / results the organisation expects. Since the introduction of the model, nurse education research has acknowledged its versatility. A review of the literature showed that the 1996 version is cited in 873 research papers identifying its value in versatility.

Rajeev et al state that the most influential framework for the evaluation of education / training programmes has come from Kirkpatrick and that most of the models in use today are modified versions of the original four level framework. The four levels of Kirkpatrick’s evaluation model are:

1. Reaction: assesses the participants’ opinions of the study day;
2. Learning: assesses the participants’ perceived increase in knowledge and skills since the study day;
3. Behaviour: identifies how the education/training has changed the performance of the participants in the workplace when encountering a clinical emergency, and;
4. Results: how the education/training has impacted on the organisation or department. (Level four was beyond the scope of this research study)

To fulfil the aim of this present study, the researcher evaluated the course using Levels one to three.

Level one was evaluated by the participants’ yes/ no response to item four on the questionnaire (see Appendix three) completed at the end of the study day: “Would you recommend this study day to your colleagues?” In Phases one and two, participants were invited to provide further comments at the end of the questionnaire. These comments were used for qualitative analysis.

Level two was evaluated through the administration of confidence scale (C Scale) questionnaires at the beginning and conclusion of the study day. This level was also evaluated in Phases one and
two with item five of the phase one questionnaire (see Appendix three) and item four on the Phase two questionnaire (see Appendix four): “Have your obstetric management skills had improved since attending the study day?”

Level three acts as a reinforcer of new behaviours and was assessed by the questionnaire and interview. Level three took place once the participants had an opportunity to use the new behaviour in the clinical setting - that is during phase two which occurred between two and eight months after the study day. During the interviews, the participants were asked to describe an emergency situation they had experienced since attending the study day. Participants were asked to reflect on the experience guided by the questions listed below on page 39. This reflection time provided the opportunity to consider their behaviour and whether the study day had made a difference to their perceived ability to respond to a real emergency situation.

4.3 Setting

The setting for this study was in a public hospital in Perth, WA. The HER-Obs study days were held in a training centre comprising of a lecture theatre, tutorial rooms and a simulation suite. Positions on the course were allocated for one to two doctors and four to five registered nurses from each department (ED, OT and ICU). An extra position was available for one anaesthetic technician for the theatre team. This allocation ensured an appropriate mix of personnel who would manage an emergency in the clinical area.

On the study day, the participants were assigned to teams - depending on their designated work area. The HER-Obs program consisted of discussions, case studies and group activities in the lecture theatre, followed by simulated emergency scenarios within the simulation suite. (See Appendix one for study day program)
4.4 Sample

All participants in the study were employees of the hospital in which the research took place. A convenience sample of 38 of the 39 participants who attended one of the three HER-Obs study days offered over the six-month period between October 2017 and March 2018, were involved in the study.

4.5 Recruitment

Obstetric emergency training is not mandatory for clinical staff working outside of the maternity unit. Clinical staff from ED, ICU and OT registered to attend voluntarily. Prior to the study day, a letter explaining the research and inviting participants to be part of the research study was sent to all booked attendees (see Appendix five). Potential volunteers were invited to contact the researcher for further explanation if required.

Recruitment occurred when participants attended one of the three study days. The rationale for the research was explained to the group at the start of each study day and those willing to participate were asked to complete a consent form (see Appendix six).

4.6 Data collection

Data were collected over phases one and two. Each phase is now explained.

Phase one: On the study day, participants were asked to:

1. Complete a C Scale questionnaire and demographic information prior to commencement of the training (see Appendix three).
2. On conclusion of the study day, participants were invited to complete the C Scale questionnaire once again and of they chose to, add comments, in the space provided.
Phase two: At a follow-up at a later date the participants were invited to:

1. Complete another C Scale questionnaire and add comments if they wished to do so (see Appendix four).
2. Take part in one to one, semi-structured interviews

Detail of data collection in phases one and two are provided below. (Table 4-1)

Table 4-1 Data collected in each of the study phases.

<table>
<thead>
<tr>
<th>Data Collection stages</th>
<th>Phase one – On the study day. (three study days between October 2017 &amp; March 2018)</th>
<th>Phase two – Follow up (May - July 2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before and After study day confidence questionnaire completion Participant n=38</td>
<td>Confidence questionnaire completion Participant n=23 Semi structured face to face interviews with participants n=10</td>
</tr>
</tbody>
</table>

4.6.1 Data collection Phase one:

An outline of the study was presented on the front page of the questionnaire, also details of the researcher, supervisors and ethics approvals. Participants were asked to place the completed survey and separate consent form in to a sealed box situated at the back of the room at the end of the day. The surveys were de-identified to allow the participants to respond anonymously.

Demographic data were collected on pages one and two which included:

- Gender;
- Age range (20 – 29, 30 – 39, 40 – 49, 50 or over);
- Professional group (Registered Nurse, Enrolled Nurse, Anaesthetic Technician, Doctor);
- Current working department (ED, OT, ICU);
• Years of experience in current role (Less than one year, one-three years, three-five years, More than five years);
• Previous experience with an obstetric emergency (Yes / No).

This data were collected to compare the level of confidence between groups. This information was used to cross reference the confidence questionnaires collected in Phase two to the confidence questionnaires from Phase one. As the responses to the questionnaires were anonymous, this was required to compare individual results across the two survey periods.

Quantitative data were collected using an adaptation of the Confidence Scale (C Scale) developed by Grundy in 1993. The C Scale has been used in previous research and cited in 65 studies. The scale has a reportedly high internal consistency of Cronbach’s alpha – 0.84 – 0.93 and supported the construct, content and concurrent validity of the scale. The adapted scale used in this study was tested for internal consistency and has a Cronbach’s alpha of 0.745. This is appropriate as the size of the coefficient alpha should be greater than or equal to 0.70 for research purposes.

The C Scale had three statements to which the participants were asked to rate their perceived confidence when confronted with an obstetric emergency. They were instructed to circle the number which best reflected their response. The three C Scale questions being:

1. I feel confident in recognizing an obstetric emergency,
2. I feel confident in commencing the initial management of an obstetric emergency,
3. I know how to escalate obstetric emergency care to the Midwives and Obstetricians.

Participants were asked to respond to each item via a Likert type scale ranging from no confidence, minimal confidence, fairly confident to very confident. The midpoint category of neutral used in a five point Likert scale was avoided to ensure the participants did not provide an ambivalent response. Participants were instructed to circle the number which best reflected their response.
Using a pre-test / post-test method the C Scale was administered to the participants prior to the commencement of the study day and again at completion of the study day. The two Yes / No questions were added to the post-test. These two questions were:

4. Would you recommend this study day to your colleagues?
5. Do you think your obstetric management skills have improved since attending this study day?

Qualitative data were collected by inviting the participants to make further comments in relation to the study day. Participants could enter the comments with anonymity as the questionnaires were de-identified.

4.6.2 Data collection Phase two:

Following the completion of the HER-Obs study day, prospective participants were sent an email at two monthly intervals as a reminder to contact the researcher once they had experienced an obstetric emergency. The researcher was mindful the obstetric emergencies do not occur frequently, therefore it was acknowledged that the participants’ response time would vary. However, several months may elapse between the study day and an emergency situation. Consequently, the participants were invited to undertake in an interview regardless of whether they had experienced an obstetric emergency or not. It was anticipated that the participants could reflect and draw on the knowledge gained from the study day since there was a strong emphasis placed on teamwork and communication – which can be applied to any emergency situation including an obstetric emergency.

Two months after the third study day, despite the regular email contact, no participants had approached the researcher to confirm they had experienced an obstetric emergency. The researcher sent a copy of the Phase two questionnaire to the participants in a sealed envelope. Anonymity was maintained by omitting the option for the participants to add their name. The
completed questionnaires were returned to the researcher’s office via the hospital internal mail system. Of the 38 participants in Phase one, three staff could not be contacted due to terminating their employment with the hospital. Of the 35 remaining participants, 23 (66%) completed and returned the Phase two questionnaires (see Appendix four). A survey response rate of 66% is high as research has shown that the average response rate is around 50%.84

4.6.2.1 Quantitative data:

The Phase two questionnaire repeated the demographic questions from Phase one so that the responses could be cross-referenced to the Phase one demographic data to match the responses as the surveys were de-identified. The confidence questionnaire asked the participants to rate their confidence level after a period of time since the study day. The same three questions from Phase one were repeated and used with the four-point Likert scale response.

A further four questions were added to enable analysis of whether confidence levels altered over time and if other variables such as length of time since the study day, attendance at further training or experience with an obstetric emergency had an influence on their perceived confidence. These questions are listed (Table 4-2)

Table 4-2 Questions added to the Phase two questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Which study day did you attend?</td>
<td>October 2017</td>
</tr>
<tr>
<td></td>
<td>December 2017</td>
</tr>
<tr>
<td></td>
<td>March 2018</td>
</tr>
<tr>
<td>5. Do you think your obstetric management skills have improved since</td>
<td>Yes</td>
</tr>
<tr>
<td>attending the study day?</td>
<td>No</td>
</tr>
<tr>
<td>6. Have you attended any further obstetric training since the study day?</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>7. How long after the study day did you encounter an obstetric emergency?</td>
<td>Within 1 week</td>
</tr>
<tr>
<td></td>
<td>Within 1 month</td>
</tr>
<tr>
<td></td>
<td>Within 2 months</td>
</tr>
<tr>
<td></td>
<td>Within 3 months</td>
</tr>
<tr>
<td></td>
<td>Longer than 3</td>
</tr>
<tr>
<td></td>
<td>months</td>
</tr>
<tr>
<td></td>
<td>I have not</td>
</tr>
<tr>
<td></td>
<td>experienced</td>
</tr>
<tr>
<td></td>
<td>an obstetric</td>
</tr>
<tr>
<td></td>
<td>emergency</td>
</tr>
</tbody>
</table>
4.6.2.2 Qualitative data:

Of the 23 participants who returned the Phase two questionnaire, 10 agreed to undertake a one to one interview. The interview questions were guided by the Gibb’s Reflective Model (GRM) as this model is often used in the nursing profession because it allows the individual to explore the experiences from their perspective. At least three tertiary institutions in the Perth metropolitan area employ the GRM for nursing students (Personal communication via email: H Dugmore, O Gallagher, A McCallum December 2018). Gibb’s reflective model (Figure 4-2) consists of six stages which facilitates the person to reflect on a specific situation or event. The six stages comprise of: 1. Description (of the situation); 2. Feelings (about the situation); 3. Evaluation (of the situation); 4. Analysis (of the situation); 5. Conclusions; and, 6. Action to take to improve or not.

Figure 4-2 The six-stage reflective model developed by Graham Gibbs (1988)

The Gibb’s Reflective Model is based on a problem-solving approach. The model has been used previously to explore healthcare education and the effect on patient’s care. Rodigo\textsuperscript{67} states that the Royal College of Nursing (2012) believes that this model is superior because it emphasises the role of emotions and their importance in the reflection process. The literature suggests that Gibb’s model is useful because many practitioners have found it to be successful.\textsuperscript{35} Essentially, reflective practice can empower nurses. It enables nurses to deliver care which incorporates a better understanding, foster self-awareness, moreover, nurses become more competent and ultimately this assists them to initiate change and thereby improve the quality of care provided to patients.\textsuperscript{35}

Reflection places theory and practice in a two-way relationship between knowing and doing which results in the “knowledgeable doer”. Schon (1987 cited in McIntosh et al.)\textsuperscript{23} states that reflection bridges the gap between formal education and the complex questions and actual demands of clinical practice in two ways: Firstly, reflection in action, and secondly, reflection on action. The interview techniques used in this research enabled the participants to reflect on their action in an emergency situation.

The aim of reflective practice is for the participants to assess, understand and learn through their experiences. Critical incident analysis can be used as a tool to develop knowledge, skills and attributes\textsuperscript{23} in this case by using an example of experiencing an obstetric emergency and evaluate that experience from a confidence perspective. In the interview process, the participants were asked to relate an obstetric emergency they had experienced since attending the HER-Obs study day. Since an obstetric emergency cannot be predicted or planned, the time period between attending the study day and experiencing an emergency situation varied between participants.

The primary focus of the study day were the key concepts of teamwork and communication in an emergency situation. Thus, those participants who had not experienced an obstetric emergency were invited to relate another medical emergency they had experienced. Participants could draw on the knowledge gained from the study day to relate to any emergency they had experienced.
4.7 Qualitative data: Interviews

Interviews facilitated the collection of qualitative data. One to one interviews were conducted at a mutually agreed time and took place in a quiet office within the hospital. Time constraints of the interviewees who were rostered on duty at the time of the interview limited the length and possibly the depth of the data collected. The interviews were recorded using a voice recorder mobile phone application and securely saved to a Secure digital card which was kept locked in the researcher’s office. As stated, the six stages of the GRM were used to guide the interview questions. At the interview, the participants were asked to relate their own experience of being involved in an obstetric (or other) emergency. Before commencing the interview, the researcher re-iterated the intention and confidentiality of the study.

Participants were asked the following questions which followed the GRM steps. Probing questions were used to elicit more information:

Step one: Description

Please tell me what happened in the incident that occurred?

What happened next?

Can you tell me more?

Step two: Feelings

How did you feel at the time and later?

This question was asked on one or more opportunities during the interview to allow the participant to relate their feelings in relation to the experience.

Step three: Evaluation

What went well?

What didn’t go so well?
What were your observations of the team – regarding team work and communication?

Step four: Analysis

Did you draw on the knowledge from the study day? If so, how?

In relation to the study day, do you reflect on what was taught?

Step five: Conclusion

How could have this experience been a more positive experience for all involved?

If faced with another emergency in the future, what would you do differently?

Step six: Action plan

What further training would you like to attend, so that you can handle this situation better in the future?

Is there anything else you would like to add?

4.8 Data Analysis

4.8.1 Quantitative data:

Data from the C Scale were entered into the IBM SPSS v25 software program. Counts, frequencies and percentages were used to describe the demographic characteristics of the study participants. The confidence score of each participant was calculated in each survey period. With the four-point Likert scale, a score of one indicated no confidence, two minimal confidence, three fairly confidence and four very confident. To obtain an overall confidence rating, with the four-point Likert scale and three questions, the total score could range from three (no confidence) to 12 (very confident).

The Shapiro Wilks test was used to check for normal distribution. As this test showed that due to a reduced number of participants in Phase two, the distribution was not normally distributed.
Therefore, non-parametric tests were used. When comparing all test groups, the level of significance was set at $p<0.005$.

The Friedman test was used to identify any difference in the confidence scores obtained over the three survey periods. The Wilcoxin signed rank test was used to compare changes in confidence levels between the three survey periods. To test for differences in total confidence if participants had encountered an obstetric emergency since the study day or whether they had attended any further obstetric emergency training, the Mann-Whitney U test was used.89

4.8.2 Qualitative data:

The method of the qualitative component of this research was exploratory. This was to validate the views, perspectives and experiences of the participants in relation to the knowledge gained from attending the study day.90 Thematic analysis was used to analyse the data. A strength of thematic analysis is its flexibility – it can be used to answer any type of research question.90

For this study, analysis involved identifying any themes or patterns, such as possible changes to the program, gaps in teaching and the value of the program, whether confidence had increased (or not) and the value of cohesive team-work.

The process for analysing the data are described below and followed the six phases as described by Braun and Clarke (2012)91. Maguire et al. (2017) suggest that this process is arguably the most influential approach to use because it offers a clear and useable framework and is a very flexible method.92

Braun and Clarke (2012) six phases of analysis:

1. Familiarizing yourself with the data.

The audio recordings were transcribed verbatim by the researcher and listened to several times to ensure all sentences were transcribed accurately. The transcriptions were checked against the
recordings for accuracy, then each transcript assigned a code to ensure data were de-identified. Identification was labelled as: RN (Registered Nurse), Dr (Doctor) or AT (Anaesthetic Technician) and by work department ED (Emergency Department), OT (Operating Theatre) or ICU (Intensive Care Unit). This labelling was to enable analysis of the data in the same way as the quantitative data - that is by comparing professional groups and work departments. The transcribed interviews and the free text comments from the questionnaires were read and re-read to gain an overall impression of the information received.

2. Generating initial codes

The data were analysed to address the specific research questions. Not all segments of text were coded – only those of interest or relevant to the research questions. The codes were developed and modified as each transcript were read. Coding was undertaken manually by highlighting texts within the hardcopies of the transcriptions then transferring examples into codes within the NVivo12 software program. The coding system used was based on Kirkpatrick’s model of evaluation. Data from the transcripts and the free text comments were added. An example of this coding is displayed below (Figure 4-3). Reliability of the coding was by the researcher cross checking to eliminate any duplication. The researcher’s supervisors also reviewed the coding for consistency.
3. Searching for themes:

The codes were the analysed to identify themes and patterns that linked to the research question in relation to confidence and the reasons the participants reported confidence (or not) when encountering an obstetric emergency. The majority of the codes could be assigned to one or more themes. (Figure 4-4)
3. **Reviewing potential themes:**

The emerging themes were reviewed to check for repetition. All main themes were checked against the coded data and reviewed again to determine if they related to the research question and the factors that influenced confidence.

4. **Defining and naming themes:**

The names of the themes should clearly state what is unique and specific about each theme. Some themes were related but do not overlap or directly address the research question. Ideally, the theme names should be informative, concise and catchy. A thematic map was developed to give a visual representation of the themes and their relation to the research question.
4.9 Managing bias

The researcher designed and facilitated the study day which is the focus of this research project. As such, the researcher acknowledges that this involvement may influence the interpretation of findings and on participants’ responses. To mitigate bias, the questionnaires were de-identified to allow the participants to respond anonymously. During the process of collecting and analysing the qualitative data, the researcher endeavoured to focus on the issues and concerns of the participants instead of self-interest and pre-conceived conclusions. However, it is acknowledged that with qualitative research a personal interpretation of data may introduce possible bias. The transcripts and coding data were reviewed independently by the researcher’s supervisors to check for researcher bias.

4.10 Ethical considerations

Approval to conduct the study was obtained from the University of Western Australia Human Research Ethics Committee (Approval number RA/4/1/8888) and from the East Metropolitan Health Service - Human Research Ethics Committee (HREC) (Approval number RGS0000000096) following the WA Health Research Governance Policy and Procedures Framework. To safeguard confidentiality, participants were not required to add their name to any of the surveys. No individual has been or will be identified in any report generated from this study. Participation in the study was on a voluntary basis and the participant had the opportunity to withdraw at any time without censure. The participants signed a consent form at the beginning of the study day which included a section for consent to be contacted to take part in an interview at a later date. The completed surveys were kept in a locked drawer in the researcher’s office. Participants were reassured that all recorded data were assigned a code to safeguard confidentiality. All interviews were recorded onto a secure digital (SD) card and transcribed verbatim. The SD card and transcripts of the interviews were stored in a locked cabinet in the researcher’s office. Data were entered onto a password protected computer known only to the researcher. Data were reviewed
by the researcher and supervisors only. All data were managed as per the UWA data management plan. Transcripts, SD cards and study findings will be destroyed five years after publication of this study as per the Australian Code for the Responsible Conduct of Research.

Risks to participants: Discussing emergency procedures may be distressing. Participants were made aware of availability of debriefing or counselling services available through the East Metropolitan Health Service. Cards with the contact details of the Health Department counselling services were available to the participants on the study day and at the interview.

4.11 Summary

This chapter described the methodology used for this research project. Provided was the aim, study design and model used. The setting for the study and how participants were recruited was explained. Data collection methods and framework were discussed and how both quantitative and qualitative data were analysed. Finally, ethical considerations and approval for the study detailed. Chapter five will report the findings from the data analysis.
5 Chapter 5 Results and findings

5.1 Introduction

This chapter presents the analysis of data collected through the C Scale and interviews. As the study involves two parts, each will be presented separately. Part one involves analysis of the quantitative data which emerged from the C Scale survey component of the questionnaire. The C Scale was administered in Phase one, before and after attendance at the HER-Obs study day. Administration of the C Scale was repeated in Phase two which occurred between two and eight months after the participants attended the study day. Part two of the study presents the qualitative findings from the one to one interviews with 10 participants including participants’ comments from the questionnaires in both Phase one and Phase two.

5.2 Participant profile

Participants were recruited from three hospital departments external to the maternity unit. Of the total (n=39) participants attending the three individual study days during the research period, 38 (97%) consented to take part in the research project. Generally maternity patients are admitted to the ICU after an obstetric emergency has occurred elsewhere. Despite this, ICU clinical staff requested obstetric emergency training to increase their knowledge and to be prepared in the event that another obstetric emergency occurred whilst the woman was in the ICU.

5.3 Demographics of all participants:

As the study day involved the participants working in teams for simulated emergency scenarios, the places on the study day were allocated to Doctors and Registered Nurses from ED and ICU and Anaesthetists, Anaesthetic Technicians and Registered Nurses from OT.

In total, nine (24%) of the participants were Doctors, 26 (68%) were Registered Nurses and three (8%) were Anaesthetic Technicians. (Table 5-1) Of these, 17 (45%) of the attendees worked in ED, 18 (47%) worked in OT and three (8%) worked in ICU.
**Table 5-1 Study population by profession. (Phase one)**

<table>
<thead>
<tr>
<th>Profession</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>Registered Nurse</td>
<td>26</td>
<td>68</td>
</tr>
<tr>
<td>Anaesthetic Technician</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

All age groups were represented, however, 42% were aged between 30 and 39 years of age. Of the nine doctors, eight (89%) were aged between 30 and 49 years. Twelve (46%) of the nurses were aged between 30 and 39 years of age. Five (19%) of the nurses were aged between 20 and 29 years of age to the eldest nurses (n=4, 16%) aged over 50. Two of the Anaesthetic Technicians were aged between 20 and 29. The other Anaesthetic Technician was aged over 50 years. (Table 5-2)

**Table 5-2 Summary of ages of the study day participants**

<table>
<thead>
<tr>
<th>Age</th>
<th>Doctors n=9</th>
<th>Nurses n=26</th>
<th>Anaesthetic Technician n=3</th>
<th>Total n=38</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–29</td>
<td>1 (11%)</td>
<td>5 (19%)</td>
<td>2 (67%)</td>
<td>8 (21%)</td>
</tr>
<tr>
<td>30-39</td>
<td>4 (44.5%)</td>
<td>12 (46%)</td>
<td>0</td>
<td>16 (42%)</td>
</tr>
<tr>
<td>40-49</td>
<td>4 (44.5%)</td>
<td>5 (19%)</td>
<td>0</td>
<td>9 (24%)</td>
</tr>
<tr>
<td>Over 50</td>
<td>0</td>
<td>4 (16%)</td>
<td>1 (33%)</td>
<td>5 (13%)</td>
</tr>
</tbody>
</table>

Two thirds (n=6) of the doctors who attended the study days worked in ED, the remaining third (n=3) were anaesthetists working in OT. During the study period, no doctors from ICU attended the study day. Eleven (42%) Registered Nurses worked in ED, 12 (46%) in OT and three (12%) worked in ICU. All three of the Anaesthetic Technicians worked in OT. (Table 5-3)
Table 5-3 All participants according to profession and assigned work department.

<table>
<thead>
<tr>
<th>Work Department</th>
<th>Doctors n=9</th>
<th>Registered Nurses n=26</th>
<th>Anaesthetic Technician n=3</th>
<th>Total n=38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Department</td>
<td>6 (67%)</td>
<td>11 (42%)</td>
<td>0</td>
<td>17 (45%)</td>
</tr>
<tr>
<td>Operating Theatre</td>
<td>3 (33%)</td>
<td>12 (46%)</td>
<td>3 (100%)</td>
<td>18 (47%)</td>
</tr>
<tr>
<td>Intensive Care Unit</td>
<td>0</td>
<td>3 (12%)</td>
<td>0</td>
<td>3 (8%)</td>
</tr>
</tbody>
</table>

The majority of the participants had more than five years of experience in their profession. One doctor had less than one year of experience since graduating, four (44%) had been working as a doctor for one to five years and four (45%) had more than five years’ experience. Of the Registered Nurses, three (12%) had up to five years’ experience with the majority (88%) working as a Registered Nurse for more than 5 years. Of the three ATs, one had less than a year of experience, one had three to five years’ experience and one had more than five years’ experience. (Table 5-4)

Table 5-4 Participants by years of experience

<table>
<thead>
<tr>
<th>Years of experience</th>
<th>Doctors n=9</th>
<th>Registered Nurses n=26</th>
<th>Anaesthetic Technician n=3</th>
<th>Total n=38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>1 (11%)</td>
<td>2 (8%)</td>
<td>1 (33%)</td>
<td>4 (10%)</td>
</tr>
<tr>
<td>1 – 3 years</td>
<td>2 (22%)</td>
<td>1 (4%)</td>
<td>0</td>
<td>3 (8%)</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>2 (22%)</td>
<td>0</td>
<td>1 (33%)</td>
<td>3 (8%)</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>4 (45%)</td>
<td>23 (88%)</td>
<td>1 (33%)</td>
<td>28 (74%)</td>
</tr>
</tbody>
</table>

Regardless of the number of years of experience in their profession, the majority of the participants had previous experience with an obstetric emergency. Seven of the nine (78%) doctors had been involved in an obstetric emergency. Similar to the doctors, the majority (73%) of Registered Nurses had experienced an obstetric emergency prior to attending the study day. Two of the three Anaesthetic Technicians had also experienced an emergency. (Table 5-5)
5.4 Quantitative data collection and analysis.

5.4.1 Phase one: Data collected at the study day.

The C Scale was administered to the participants at the commencement and completion of the study day. The three questions asked in relation to the level of confidence were:

1. I feel confident in recognising an obstetric emergency;
2. I feel confident in commencing the initial management of an obstetric emergency;
3. I know how to escalate obstetric emergency care to the Midwives and Obstetricians.

Participants responded to the same three questions at the end of the study day to determine whether attendance had increased their perceived confidence level should they encounter an obstetric emergency.

Analysis of the responses to the C Scale questions.

Before the study day: Results showed that 15 (39%) participants reported minimal confidence, 22 (58%) felt fairly confident and only one participant (3%) felt very confident they could recognise an obstetric emergency. At the end of the study day: Results showed that all participants were either fairly confident 66% (n=25) or very confident 34% (n=13) (Table 5-6)
Table 5-6 Before and After study day results in response to question one - Confidence in recognising an obstetric emergency. (%).

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Before Study Day</th>
<th>After Study Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Confidence</td>
<td>3 (8%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Minimal Confidence</td>
<td>20 (53%)</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Fairly Confident</td>
<td>12 (32%)</td>
<td>22 (58%)</td>
</tr>
<tr>
<td>Very Confident</td>
<td>3 (8%)</td>
<td>13 (34%)</td>
</tr>
</tbody>
</table>

The second question related to how confident the participants perceived they felt at commencing the initial management of an obstetric emergency. Results from before the study day revealed that three (8%) of the participants had no confidence at all, 20 (53%) had minimal confidence, 12 (32%) felt fairly confident and three (8%) were very confident. After the study day results revealed that only one participant (3%) reported no confidence, two (5%) had minimal confidence, 22 (58%) were fairly confident and 13 (34%) felt very confident. (Table 5-7)
Table 5-7 Before and After study day responses to Question two - Confidence in commencing the initial management. (%)

Results from question three relate to how the participants felt about knowing how to escalate obstetric emergency care to experts in obstetric management to take over care of the patient. Before the study day results revealed two (5%) participants had no confidence at all, 10 (26%) minimal confidence, 20 (53%) felt fairly confident and six (16%) were very confident. After the study day results showed that 14 (37%) were fairly confident and 24 (63%) felt very confident. (Table 5-8)

Table 5-8 Before and After study day responses to Question three - Confidence in knowing how to escalate care to the Midwives and Obstetricians. (%).
Questions four and five asked for a yes/no response. These were:

4. Would you recommend this study day to your colleagues?

5. Do you think your obstetric management skills have improved since attending this study day?

All participants stated yes to both questions.

5.4.2 Phase two: Data collected between two- and eight-months following completion of the study day.

The Phase two questionnaire was sent to all participants during the months of May to June 2018. The demographic questions from the phase one questionnaire were repeated. The C Scale asked the participants to rate their confidence level after a period of time since attending the study day. The same three questions from Phase one were repeated using the four-point Likert scale response. A further four questions were added to analyse whether confidence levels altered over time and if other variables such as length of time since the study day, attendance at further training or experience with an obstetric emergency had influenced their perceived confidence.

(Table 5-9)

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Which study day did you attend?</td>
<td>October 2017</td>
</tr>
<tr>
<td>5. Do you think your obstetric management skills have improved since attending the study day?</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Have you attended any further obstetric training since the study day?</td>
<td>Yes</td>
</tr>
<tr>
<td>7. How long after the study day did you encounter an obstetric emergency?</td>
<td>Within 1 week</td>
</tr>
</tbody>
</table>
Of the original 38 participants, three (8%) were no longer employed at the hospital. Of the remaining 35 available participants, 23 (66%) completed the questionnaire. The Phase two sample group had a similar representation to the Phase one sample. *(Table 5-10)*

**Table 5-10  Phase two Sample by work department**

<table>
<thead>
<tr>
<th>Work Department</th>
<th>Doctors</th>
<th>Registered Nurses</th>
<th>Anaesthetic Technician</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=4</td>
<td>n=16</td>
<td>n=3</td>
<td>n=23</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>3 (75%)</td>
<td>7 (44%)</td>
<td>0</td>
<td>10 (43%)</td>
</tr>
<tr>
<td>Operating Theatre</td>
<td>1 (25%)</td>
<td>7 (44%)</td>
<td>3 (100%)</td>
<td>11 (48%)</td>
</tr>
<tr>
<td>Intensive Care Unit</td>
<td>0</td>
<td>2 (12%)</td>
<td>0</td>
<td>2 (9%)</td>
</tr>
</tbody>
</table>

**5.4.2.1  Results from the C Scale for all participants in Phase two**

In Phase two, the C Scale survey was repeated and participants responded to a Likert scale. Results are presented as a percentage and show the comparison of confidence levels for the questions over the three survey collection points – before and after the study day and at a later date (between two and eight months after the study day). Each result is compared.

Results of the C Scale questions administered to the participants at a later date are now reported. In response to question one - I feel confident in recognising an obstetric emergency, 18 (78%) of the participants reported that they continued to feel fairly confident and five (22%) reported being very confident. *(Table 5-11)*
The second question related to how confident the participants perceived they felt at commencing the initial management of an obstetric emergency. Results revealed only two (9%) of the respondents had minimal confidence to commence the initial management of an obstetric emergency. Of the remaining responses, 15 (65%) felt fairly confident and six (26%) felt very confident. (Table 5-12)

*Table 5-12 Responses to Question two - Confidence in commencing the initial management of an obstetric emergency over the three survey periods. (%)*
Results from question three relate to how the participants felt about knowing how to escalate obstetric emergency care to experts in obstetric management to take over care of the patient.

Results revealed seven (30 %) of the participants reported feeling fairly confident and 16 (70%) felt very confident. (Table 5-13)

Table 5-13 Responses to Question three - Confidence in knowing how to escalate care to the Midwives and Obstetricians over the three survey periods. (%)

![Confidence level chart]

Total confidence scores were calculated individually for all of the participants at each of the three survey time periods. (Table 5-14)

Table 5-14 Total confidence score calculation

<table>
<thead>
<tr>
<th>Confidence level</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Confidence</td>
<td>1</td>
</tr>
<tr>
<td>Minimal Confidence</td>
<td>2</td>
</tr>
<tr>
<td>Fairly Confident</td>
<td>3</td>
</tr>
<tr>
<td>Very Confident</td>
<td>4</td>
</tr>
</tbody>
</table>

As the same confidence questions were asked at each of the three survey periods, the scores from the three questions were combined to give each participant an overall confidence score for each
individual survey period. The total score could vary between a score of three if the responses to all three questions reported no confidence, to a score of 12 if all three responses reported very confident. The total scores were entered into the SPSS V25 software for analysis. Results of the increase in confidence level between the three survey periods is shown below. (Table 5-15)

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total confidence score Before study day</td>
<td>38</td>
<td>7.8158</td>
<td>1.70619</td>
<td>5.00</td>
</tr>
<tr>
<td>Total confidence score After study day</td>
<td>38</td>
<td>10.2105</td>
<td>1.29777</td>
<td>7.00</td>
</tr>
<tr>
<td>Total confidence score later</td>
<td>23</td>
<td>10.0435</td>
<td>1.10693</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Representation of the total scores for the three survey periods are displayed below. (Table 5-16)

Table 5-16 Box Plot: Total confidence scores – All three survey periods.

![Box Plot](chart.png)
To test if the data were normally distributed, the Shapiro Wilk test was used. Results show that the data in the first two survey periods appeared to be normally distributed. As there were less participants in the third survey period, the total data was not normally distributed. Total confidence score at a later date: Sig. 0.031  \( p = <0.05 \) (Table 5-17)

**Table 5-17 Shapiro – Wilk test: Total confidence scores – All survey periods**

<table>
<thead>
<tr>
<th></th>
<th>Stat</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total confidence score</td>
<td>0.927</td>
<td>23</td>
<td>.092</td>
</tr>
<tr>
<td>Before study day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total confidence score</td>
<td>0.938</td>
<td>23</td>
<td>.165</td>
</tr>
<tr>
<td>After study day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total confidence score</td>
<td>0.905</td>
<td>23</td>
<td>.031</td>
</tr>
<tr>
<td>Later</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To determine if a significant difference exists in relation to the confidence levels between the three survey periods, as the data were not normally distributed, the non-parametric Friedman test was used. The results of the Friedman test indicated that there were statistically significant differences in the total confidence scores across the three time points (Before study day, After study day and later date).  \( X^2 (2, n = 23) = 28.00, p = <0.005 \).

A Wilcoxin signed rank test revealed a statistically significant increase in confidence from before to after the study day, \( z = -4.974, p = <0.005 \) with a median score increased from Before study day (Md = 8) to After study day (Md = 10). There was a decrease in the total confidence score from After study day to later date however, this reduction was not significant. \( Z = -0.719, p = 0.472 \) with a median score for both survey periods of 10. Comparing the Before study day scores to the final survey, later date, there was a statistically significant increase in confidence. \( Z = -3.951, p = <0.005 \). The median score increased from Before study day (Md = 8) to later date (Md = 10). (Table 5-18)
Table 5-18 Wilcoxin signed ranks test: Total confidence scores All three survey periods

<table>
<thead>
<tr>
<th></th>
<th>Total confidence score After study day – Total confidence score Before study day</th>
<th>Total confidence score Later date – Total confidence score After study day</th>
<th>Total confidence score Later date – Total confidence score Before study day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-4.974&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.719&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-3.951&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Asymp.Sig. (2-tailed)</td>
<td>.000</td>
<td>.472</td>
<td>.000</td>
</tr>
</tbody>
</table>

<sup>a</sup> Based on Negative ranks

Table 5-19 Descriptive statistics: Total confidence scores All three survey periods.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>25th</th>
<th>Median 50%</th>
<th>75th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total confidence score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before study day</td>
<td>38</td>
<td>6.75</td>
<td>8.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Total confidence score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After study day</td>
<td>38</td>
<td>9.00</td>
<td>10.00</td>
<td>11.00</td>
</tr>
<tr>
<td>Total confidence score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later date</td>
<td>23</td>
<td>9.00</td>
<td>10.00</td>
<td>11.00</td>
</tr>
</tbody>
</table>

5.4.2.2 Results by professions

Statistical analysis was conducted to determine if there was a difference in confidence between the three professional groups (RNs Drs and ATs) represented at the study day.

Table 5-20: Total confidence Scores – All survey periods – by profession
Results of the Friedman test indicated that there was a statistically significant difference in the total confidence scores across the three time points for Registered Nurses. $X^2 (2, n = 16) = 24.644$, $p = <0.005$. A review of the median values showed an increase in confidence from pre-test ($Md = 7$) to post-test ($Md = 10$) and this confidence was maintained at a later date ($Md = 10$).

Comparing the responses of the Doctors and Anaesthetic Technicians however, there was no significant difference in the total confidence scores. Doctors: $X^2 (2, n = 4) = 4.667$, $p = 0.097$. pre-test ($Md = 10$) post-test ($Md = 11.5$) and later date ($Md = 11$). Anaesthetic Technicians: $X^2 (2, n = 3) = 1.400$, $p = 0.497$. pre-test ($Md = 8$) post-test ($Md = 8$) and later date ($Md = 9$).

### 5.4.2.3 Time between attending the study day and experiencing an obstetric emergency

Hospital statistics show that many women with an obstetric related diagnosis are treated outside of the Maternity Unit. During 2017, 503 women were treated in the ED with an obstetric related diagnosis, 448 were managed in the OT with an unplanned obstetric procedure and 22 women were admitted to the ICU due to an obstetric complication. An obstetric emergency may occur within a department; however, the participants may not be on duty at the time. To this end, 12 (52%) of the participants had not experienced an obstetric emergency since attending the study day when the Phase two survey was conducted.

The following table shows the time between attending the study day and experiencing an obstetric emergency. *(Table 5-21)*
Table 5.21 Time lapse between participants attending the study day and experiencing an obstetric emergency

<table>
<thead>
<tr>
<th>Time to Obstetric emergency</th>
<th>Number of participants</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 1 week</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Within 1 month</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Within 2 months</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Within 3 months</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>4 months or more</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Have not experienced an obstetric emergency</td>
<td>12</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
</tr>
</tbody>
</table>

A Mann-Whitney U test revealed no significant difference in the confidence levels of the participants whether they had experienced an obstetric emergency since the study day or not. Results from question seven were: Had experienced an obstetric emergency: \((Md = 10, n = 11)\) No experience: \((Md = 10, n = 12)\) \(z = -0.640, p = 0.522\).

5.4.2.4 Further obstetric emergency training

Participants were asked whether they had received any further obstetric emergency training since attending the study day. As the question required a Yes / No response, description of what further training occurred was not identified. Five (22%) had attended further education, but the majority 78% \((n=18)\) had not. A Mann-Whitney U test revealed a significant difference in the confidence levels if the participants had further obstetric emergency training. Of the results: Had further training: \((Md = 11, n = 5)\) No further training: \((Md = 10, n = 18)\) \(z = -2.132, p = 0.033\).
5.5 Qualitative data collection and analysis.

5.5.1 Phase one:
On completion of the study day, the participants had the opportunity to make any comments about the day if they so wished. The comments have been assigned to themes discussed later in this Chapter.

5.5.2 Phase two:
On completion of the C Scale (at a later date) the participants were invited to write comments in the assigned space on the questionnaire. Furthermore, participants were contacted and invited to take part in a one to one interview. Ten interviews were conducted.

As previously stated, three of Kirkpatrick’s’ Four Levels of Evaluation\(^1\) were used to code the free text comments and the transcribed interviews. Coding included participant’s development of knowledge, skills and changes in behaviour following attendance at the HER-Obs study day. The four levels within this model are: Satisfaction, Learning, Behaviour and Results. Data are presented in relation to levels one to three. As earlier stated, level four was beyond the scope of this research.

The codes identified from analysis of the data were then developed into themes and sub themes. Five themes were identified:

1. Where to from here
2. Further education
3. Interprofessional teamwork
4. Strength of the leader
5. Support of the midwife

These emerging themes in relation to the Kirkpatrick levels one to three are presented below.

(Table 5-22)
Table 5-22. Themes and sub themes developed from the Kirkpatrick model.

<table>
<thead>
<tr>
<th>Code</th>
<th>Subtheme</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level one: Satisfaction</td>
<td>Opinions of study day</td>
<td>Where to from here</td>
</tr>
<tr>
<td>Level two: Learning</td>
<td>Need to keep learning</td>
<td>Further education</td>
</tr>
<tr>
<td></td>
<td>Need to have experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge and experience are linked to feeling confident</td>
<td></td>
</tr>
<tr>
<td>Level three: Behaviour</td>
<td>Communication</td>
<td>Interprofessional teamwork &amp; support of the Midwife</td>
</tr>
<tr>
<td></td>
<td>Teamwork</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>Strong leadership for success</td>
</tr>
</tbody>
</table>

5.6 Naming Themes:

On identification of the themes, a thematic map (Figure 5-1) was generated to provide a visual representation of the themes and their relation to the research question.

![Thematic Map](image-url)

*Figure 5-1 Thematic Map*
5.6.1 Theme 1. Working together

Working together as a team within the department and activating the escalation of care to the Midwives and Obstetricians was important for the welfare of the mother and infant and for the confidence of the participant. Sub themes such as teamwork and communication were also identified.

5.6.1.1 Subtheme – Teamwork

During the interviews, the participants reflected on an emergency situation they had been involved with since attending the study day. Working together as a team featured strongly. The following RN works in the ICU and has cared for women in the unit since attending the study day. Women are stabilised in the OT prior to transfer to the ICU. However, the RN instead reflected on another recent emergency she had experienced. When recalling this emergency, she stated;

*In those kinds of situations, teamwork is very important. When you all coordinate your rationale when the patient is crashing. If there is a good expert team you feel more confident. Your confidence level increases, you know the patient is going to be ok, someone can take over from you. Because we had all of the resources around, the consultants were around, we had a good team and our manager was there. So, it was easy for me to handle the situation I had. The unit wasn’t busy at that time so we had enough staff and resources around and dealt with it well. (RN 8).*

An RN from the OT also valued teamwork and the important role of others not directly involved with the woman during a post-partum haemorrhage; the RN stated;

*.... I’m talking about teamwork and communication. So, ordering blood, liaising with the blood bank all the time and giving information about when the packs were ready or needed or not so all was planned in a very good way. Some of the team members were not actually involved in the team but we were staying outside the theatre, relaying instructions, bringing the instruments from the CSSD and consumables from the store. Those sorts of things when*
everybody worked together as a team and clear instructions went to everybody it went very well at the time. It was good. (RN 6).

Celebrating a successful outcome inspires confidence in the team. Such a situation was related by RN 10 who recalled the urgency surrounding a post-partum haemorrhage when in the OT;

I tell him (the anaesthetist) the problem, the request and the urgency of it. They come. Then I’m getting equipment out for them to scrub and join us. Then I’m assisting the circulating nurse to give more equipment to the scrub nurse so I’m almost like a sheep dog going from one corner, to the next, to the next. Run and fetch, quite fast, around and around in circles I felt I went. ... we not only saved her; we saved her uterus. The fact that the team worked fluidly throughout and everybody did everything as bid and had the knowledge set to pre-empt requirements as much as possible, I think is a big factor. The whole team worked so cohesively. (RN 10)

Successful teamwork relies on the appropriate personnel being available. RN 7 described a successful response to a post-partum haemorrhage in recovery. However, she reflected that without the team, the outcome may have been different;

My role was identifying it initially. The midwife was there with me. We identified it... We hit the assist button and then somebody got to phone the anaesthetist and the surgeon back and then they came and we initiated the transfusion policy and then we got back in to the theatre. I remember the team worked well together. I think it went well. The fact that at that time we had plenty of help but potentially if people had gone home, the surgeon had gone home, if the anaesthetist had been far away or busy with another case, then it would have been a different matter. (RN 7)

5.6.1.2 Subtheme – Communication

The quality of the communication within the team was reported both positively and negatively. All participants recognised the importance of good communication in an emergency situation.

RN 2 had been involved in several obstetric emergencies since the study day. Two of these emergencies had involved post-partum haemorrhages of between two and three litres of blood
loss. The participant reflects on the communication which occurred during one of the emergencies in relation to the interprofessional team and information learnt on the study day;

This course improved (sic) my communication definitely, and all these things need proper communication and a broader network by involving other departments in caring for these patients. So, this course actually helped, it really helped us to communicate, to coordinate things better, call the lab and organise the time and go down and send the emergency samples and all the stuff and **not to hassle and keep communication simple and clear**, they are all helpful in this context. We don’t have to disturb them, just pass on the information, wait for the message and make sure the communication is done. (RN 2)

RN 5 had not experienced an obstetric emergency in the ED since the study day. However, she had encountered emergency situations which can occur more frequently in that department. This participant commented on the important points that were internalised from the study day;

**Clear communication with everyone, feeding information back to say if the doctor orders something like a drug, the dose, that everyone closes the loop trying to work together.** Just communicating as much as possible what you want to achieve, what you are aiming for, any new findings or things anyone picks up to say aloud to the whole team so they are aware. (RN 5)

Feeling safe to speak up in an emergency was clearly identified by AT 9;

I have to say it’s always an area that unless you have an enthusiast it’s always less than satisfactory. I feel as though many barriers have been knocked down in recent years but whether you are allowed to say something or not depends. Generally, the communication is good but it can be improved. **It needs to be constantly emphasised to people if you do see something wrong, no matter how low down the food chain you are you should be able to point it out.** If you notice a huge puddle appearing around your feet you should be able to say without worrying you will be barked at. Certainly, for the patient, nice for them I think to have a well lubricated oiled machine rather than people getting upset with each other. (AT 9)
5.6.2 Theme 2: Make it clear

A strong team needs a clear leader. Leadership may change during the progression of an emergency, especially when the care is escalated to clinicians with specific expertise related to the emergency; but whoever is the leader at the time needs to be a strong leader and communicate clearly.

DR 4 regularly experiences emergency situations in the ED and encapsulates the situation simply;

*As with any emergency, it depends on how confident and calm the team leader is.* (Dr 4)

In addition, RN 5 identified what she considered to be important aspects of a good leader;

*Always identifying a team leader who will be giving out the instructions so everyone understands that we will be only taking orders from that one person, clearly identifying everyone’s role in the resus or in the scenario.* (RN 5)

This participant identified what the important factors are in an emergency;

*I think the communication and everybody taking a role and obviously somebody being the team leader is more crucial. You don’t want everybody doing their own thing.*

She supported the above statement by providing an example of what happened in the OT when a clear leader was not clearly identifiable;

*We had an emergency the other day, a code blue. Every anaesthetist turned up. There was no clear direction as they were all doing their own thing. It all turned out ok in the end but at the time I thought “oh my god!” nobody is knowing what the other one is doing and everybody was deciding, there was no clear leader. Just unsettled because you don’t know who to listen to, so it does make it confusing definitely and there were four anaesthetists. They are of equal seniority and you are thinking well... and the one anaesthetist that was the initial anaesthetist for the case kind of stepped back so you couldn’t even*
say that person (sic) was the leader so it was kind of weird. So, I think definitely that things could have been improved. (RN 7)

RN 10 described an emergency where the baby had died and they were fighting to save the mother. This RN describes how the experience of having clear leadership and how good direction sustain the team members to remain calm;

*The anaesthetist was probably one of the strongest people in an emergency that was that dire and he still has that lovely strength of calm perseverance in an emergency and just calls it as it needs to be called and doesn’t panic because he has a very good skill set and knowledge and experience that he obviously brought to the hospital. He worked with us as a team without getting us flustered. He got everything required as soon as was possible.*

She went on to reflect on what can happen if the leadership was not as clear;

*If you’ve got a situation that wasn’t like mine and the leadership becomes fragmented – I have been in that situation too. I think from the study day you really need to be able to identify who is the one primary leader and focus on that one person. Maybe ask the others to step back a little bit and maybe clarify who am I to get stuff for right now, what is the priority. I think that would be the other thing. The leadership standard might be different in other places, or you might be getting simultaneous requests from the anaesthetists needing their urgent things and the surgeons needing their urgent things and if there’s less staff available or they may not be able to process as quickly, you need to stop and say “what do you want the most?” so, I think its clarification of requests from leaders, communicating clearly...* (RN 10)

RN 6 recalled an emergency in OT, the mother was stable but the baby required resuscitation. The parents had already lost a child in similar circumstances and the team were visibly distressed. She described how a clear leader encourages the whole team to work to the best of their ability;

*I appreciated the leadership done by the paediatrician who was resuscitating at that time. He was in that situation, able to give clear instructions which everybody could follow and they did their level best. (RN 6)*
5.6.3 Theme 3: Call the midwife

The importance of working both within their own team and the wider team has been described above. Despite the objectives of the study day to give the participants the knowledge to recognise an obstetric emergency, provide the initial management and know how to escalate the care to the specialists. The participants clearly valued the support and presence of the midwife and other obstetric staff if an emergency did occur. Staff acknowledged that obstetric emergencies were outside of their “comfort zone”.

DR 4 described how staff have their own comfort levels;

_When I was a trainee in the UK, we did the MOET course which was a two-day course in the management of obstetric emergencies and trauma. There were obstetric emergencies one day and trauma the next. The obstetric team hated trauma and ED the obstetrics – you could see the comfort zones._ (DR 4)

RN 10 was confident that the woman was in safe hands, however, stated how she looked to the midwife for leadership and support;

_A confident urgency that we would do everything that was required to do at the time and would facilitate everything._ Interviewer: Does it make you feel more confident? ·Yes – _but we always take our cues from the midwife of course._ (RN 10)

RN 5 described a situation where a woman gave birth on the ambulance trolley as she was wheeled into the ED. The following statement clearly shows that the team felt out of their depth and wanted the obstetric team on hand as soon as possible:

_Really nervous because none of us really knew anything about it so we were all just looking around and saying “we will take the mum” we don’t know about the baby but we will take the mum._ (RN 5)
DR 4 voiced the same opinion;

*I’m glad the midwife was around.* I am aware that I occasionally work in situations where the midwife might not be there and yes of course it’s scary because I just don’t see enough of them. I think we have the option to call the midwife, the times that I’ve seen the midwife come it is pretty quick and they become part of the team, we usually have enough pre-warning to get the midwife there. (DR 4)

DR 1 recalled how learning on the HER-Obs study day she could call an obstetric emergency code to get support had made her feel more confident;

*It was during our night shift; we had a call - there was a P1 coming in for a lady. She wasn’t seizing but had Pre-Eclampsia. Unfortunately, at the time myself and the other reg were literally just intubating a patient so the thing that helped me from the study day was I didn’t realise before that we could call an obstetric emergency so the whole team came down. So, one of our residents kind of set up for the P1 and the whole team came and kind of run it which was great. I did feel stressed about because we were going to have two sick patients and we would both need to be with the first patient that was already there but before doing the study day I didn’t know we could call that code. If it had been the same situation and I hadn’t done the study day I would have felt a lot more stressed really.* (DR 1)

RN 7 identifies the presence of the midwife as vital to support the team in recognising and caring for a woman in an obstetric emergency. She describes her experience of recognising and responding to a post-partum haemorrhage in the recovery area of the OT and the role of the midwife, she states;

*My role was identifying it initially. The midwife was there with me. We identified it and then escalated it activating the massive transfusion protocol. Got the surgeon back and the anaesthetist back and got the patient back in to theatre.*
Interviewer: You said about recognising it in the first place, so what did you see and do? Her observations didn’t really reflect it. We looked under the blankets for the final time when we were going to send her back to the ward and there was a big blood bath actually. Interviewer: How did you feel about that? I was like “Oh my God!” then you are thinking didn’t I check for a long time but we kind of always do but then we checked for the last time and saw it.

Interviewer: So, when you first had a look and went “oh my god what’s going on there” and then calling for help, was there anything else that you think you could have done - or did you know what to do? No not really. I just passed it to the midwife (laughs) because she knows better than we do. Interviewer: As you said, if it wasn’t within that half hour and you had to get the surgeons back, would you have remembered what to do or not? Probably not. I would get the midwife to do it.

Interviewer: What if the midwife went back to the ward with the baby? I would have rung the midwife (laughs) Interviewer: So, you wouldn’t have felt confident to do the first line management? No. Just because we don’t do it. If anything appears and you’re going in to a proper crash situation that’s different. Then we can do that side of things but post-partum haemorrhage wise - no… Interviewer: At the end of the study day would you have felt like you could do the steps to initiate the management? After the study day – yes. But I’ve forgotten now. If you don’t use it you forget it – So, I’d still call a midwife. (RN 7)

5.6.4 Theme 4: If you don’t use it, you lose it.

The participants were asked two questions during the interview:

1. Did you draw on the knowledge from the study day?

2. Thinking about the course, what have you thought about it since?

The majority felt that knowledge was lost over time – especially if they had not encountered obstetric emergencies. This theme has two sub themes: Confidence gained – Confidence lost and Need to refresh.
5.6.4.1 Subtheme 1: Confidence gained – Confidence lost

Confidence to recognise an obstetric emergency, provide initial management and escalate care to the specialists was the main objective of the study day. Furthermore, whether participants still felt confident when encountering an obstetric emergency at a later date is the main research question of this study.

Twelve (52%) of the participants in Phase two had not experienced an obstetric emergency since attending the study day. As discussed in the quantitative results section, there was a significant improvement overall in the perceived confidence level of participants since attending the study day. However, as time goes by, some participants do not get the opportunity to practice what they have learnt, and due to this it is surmised that confidence to react to an obstetric emergency will wane. Comments written on the questionnaire in Phase two reinforced this observation;

- I feel more confident to manage obstetric emergencies.
- Improved my confidence level.
- Although I felt very confident after attending the study day, I haven’t had an encounter with an obstetric emergency yet and hence no opportunities to practice my skills.

During the interviews, participants commented on what made them confident (or not) during their emergency experience.

RN 8 works in ICU and stated that she felt confident in an emergency for a number of factors;

Because we had all of the resources around, the consultants were around, we had a good team and our manager was there. So, it was easy for me to handle the situation I had... I feel confident. I haven’t actually seen a lady fitting post-partum but since we have seen others with a history of convulsions and seen haemorrhage, I think it is ok. I feel that as long as the team is around me and they are directing me what to do I would be the same dealing with that emergency as well. (RN 8)
RN 10 professes confidence; however, her confidence relies on the support of the midwife in an obstetric emergency as the following statement explains;

"A confident urgency that we would do everything that was required to do at the time and would facilitate everything. Does it make you feel more confident? - Yes – but we always take our cues from the midwife of course. (RN 10)"

DR 1 relates her increase in confidence in knowing that she could escalate care to the Midwives and Obstetricians;

"...before doing the study day I didn’t know we could call that code. If it had been the same situation and I hadn’t done the study day I would have felt a lot more stressed really. (DR 1)"

DR 3 agreed.

"It made me more confident that I would get more help. I think that the study day was great to actually get information on what the other team members learnt and then what I can expect and to get it together in context of what’s happening in the hospital so it was a good experience. (DR 3)"

Despite attending the study day, RN 7 felt that not being involved in obstetric emergencies had lowered her confidence;

"Interviewer: Did you feel confident? No. Just because we don’t do it. If anything appears and you’re going in to a proper crash situation that’s different. Then we can do that side of things but post-partum haemorrhage wise - no. (RN 7)"

5.6.4.2 Subtheme 2: Need to refresh

Knowledge is lost over time – especially if there are not the opportunities to apply the knowledge or practice new found skills. Comments written on the Phase two questionnaire highlighted this omission;
• The study day was very good however I feel already rusty about the details... Obviously like with everything it’s also learning by doing, and I have never had an obstetric emergency.

• Regular simulations or in-services / education to keep the information we have learnt in the course fresh in our memory.

RN 8 still feels confident about experiencing an obstetric emergency but acknowledges that theory learnt is being lost over time;

This year all the theoretical part from the study day has is leaving my memory but I think my knowledge level in dealing with an emergency and confidence level before that was what I knew to expect but now I feel more relaxed, and when you know exactly what you will be doing and who to contact, I feel more confident. I still feel that I know how to deal with an obstetric emergency, the practical things are still with me as long as you work in an emergency area. It still remains with you. (RN 8)

Participants were asked if they had any suggestions for further training. Most participants felt the need to refresh their knowledge on a regular basis and offered suggestions in addition to repeating the study day. Two participants wrote comments in relation to what they would like included besides the study day to refresh their knowledge and skills in obstetric emergencies.

• I wish to have a debrief with midwives in ED after an obstetric emergency. I believe this will improve my knowledge and skills.

• Regular simulations or in-services / education to keep the information we have learnt in the course fresh in our memory.

During the interviews, a further question relating to reflecting on the emergency event was:

What further training would you like to attend, so that you can handle this situation better in the future?
Most of the participants would like to have scenario or simulation drills on a regular basis to keep their knowledge fresh. Suggestions made by the participants are listed below.

**RN 5.** It’s been two months since the course. The information is getting slowly less, I think regular simulations or the opportunity to participate or in-service or a simulation would be very helpful as a refresher. (RN 5)

**RN 10.** Scenarios are great even though I don’t like doing them I think that is a very, very good way. Simulations make you think the processes, slow down the reaction and process it logically and have that hands-on opportunity so when it happens in real life you’ve had that scenario experience. That I think is very valuable. The only other thing would be resuscitating babies and some are far less competent with that side. Others find that very stressful if there’s a neonatal emergency. What to do, what to do next, who to call without our blue buttons to press. (RN 10)

**RN 7.** Simulation, stuff like that. The study days are good because it does keep you fresh but maybe you need to update quickly really until it becomes more embedded in you. I think people learn in different ways don’t they. I certainly learn repeatedly. (RN 7)

**RN 6.** Because I am not encountering obstetric emergencies that I am losing information that’s in my head now. I want more frequent; either courses or exposure to some drills or scenarios so at least I could have an idea. I give emphasis for organising drills or other training to help the non-midwifery staff. Some information they will retain so we can do it in the time of an emergency. (RN 6)

**AT 9.** I need to keep on going to the course. I know it doesn’t happen very often but any updates. You know you do a course; you’ve got 20 odd staff so it may be years before you go again so there needs to be some room for updating, picking up on what we learnt on the course. I think if there’s something important, a short refresher or short sessions. To include all the previous course members in it although that could get quite big, maybe some sort of email, newsletter. (AT 9)
5.6.5 Theme 5. Way forward.

Knowing whether the study day was well-received is important to future education planning. As discussed in the previous theme, participants acknowledged the need to keep learning as knowledge is lost over time. They suggested simulation or regular in-services would help. Planning for future study days or other forms of education and training can be guided by both the participants’ satisfaction and the benefits to the patients and the organisation. As discussed earlier, benefits to the patients and organisation is at Kirkpatrick level four and beyond the scope of this study.

5.6.5.1 Satisfaction with the study day

The comments written on the questionnaire on conclusion of the study day and during Phase two gives an insight into whether the participants were satisfied that the study day met their own personal objectives for attending. All comments received were positive and participants felt that it was worthwhile attending. Example of the comments are listed below:

- *It was a very factual and informative study day. I would recommend to all.*
- *It was a good course and good to know what would be the skill set of others.*
- *This course was very informative and helps me to learn management of obstetric emergencies.*
- *Very informative course. I learnt some new things and it was good to review some knowledge that I don’t use day to day.*
- *The drills were very helpful*
- *Simulations were the most helpful part of the day.*
- *Very knowledgeable staff.*

In addition, the interviewees were asked the following questions guided by the Gibb’s Reflective Model\(^6\) when reflecting on an emergency they had experienced since attending the study day.

- Did you draw on the knowledge from the study day? If so, how?
• In relation to the study day, do you reflect on what was taught?

The participants all agreed that the study day provided useful information they were able to use in practice. AT 9 gained a wider scope of what is involved in an obstetric emergency;

_I found the study day very useful. Reminding me of all the different aspects. I mean we don’t tend to get them. By the time the patient gets to us, pre-eclampsia and other things have been dealt with on the ward. We either get the patient flat, the child flat or blood loss to deal with. They were reinforced on the day I thought very effectively, I found it very useful. For me the study day was a good reminder of what would be considered quite routine for obstetric staff... I was very impressed with it. I’m making sure all of my staff are going. I think of many courses outside our normal box - you always get more information and useful information._ (AT 9)

DR 1 felt that attending the HER-Obs study day helped her develop in her new role;

_I think the study day was really helpful for me because I’d stepped up as a registrar and previously, I wouldn’t have been a team leader in these scenarios. So helpful for me to be kind of refreshed while I haven’t seen an obstetric emergency before I suppose I never really had to think of the management on my own, I always had someone to kind of help and give me a nudge and so it’s good for me. I recommend it to people. When I come back here to work, I recommend it to the guys. I definitely would be more comfortable knowing I have done the course._ (Dr 1)

DR 4 expressed that she would like to repeat the course on a regular basis and thinks all doctors should attend;

_The course was great. I would personally be very interested in doing the course every year. I have told all the guys in the department to do the course. A lot of our consultants work part time here and at a (tertiary hospital) where they don’t see obstetric emergencies at all. I think it should be almost mandatory that they come and attend the course once a year. I would say as a consultant group we should make this mandatory once a year because it is just something that will keep us in the loop, keep us involved and once a year is not too often._
It is a great course, you will get more attendees for sure, they will really enjoy the course. (DR 4)

RN 8 recognised the importance of training for emergencies outside of the maternity unit;

I think these study days are good. As long as we are part of the hospital, and we have an obstetric department I think we all should be ready to meet any emergency no matter if you are a midwife or not. (RN 8)

RN 10 appreciated the underpinning knowledge she can now use in an obstetric emergency;

I think that has been a really good reflection that the course enabled me to deliberately do otherwise I’m just reacting to the situation instead of considering the way things are best to be flowing. It was a good course. (RN 10)

RN 2 expressed that the study day content was appropriate;

I think we are covering most of the things as the secondary hospital, covering all of them which we are dealing with on a regular basis. They are appropriately structured. With the knowledge – the course is doing the best it can. (RN 2)

RN 5 wants to encourage others to attend;

I just think a lot more of us should do the course because say if on a shift only one of us has done it and have that extra bit of extra knowledge and nobody else does and you have a resus, then you are the only one that knows the process or what to do, then how to go about things. I think everyone should do the course so they are aware. The course was fantastic. All of us working in the emergency department should do it. It’s really good. (RN 5)

5.7 Summary

This Chapter has discussed the results of the study. Both Phases of the study had quantitative and qualitative data interpretation. Evaluation of the quantitative data identified that participants’ confidence with obstetric emergencies improved after attending the study day and this was maintained over time. For RNs, the improvement was statistically significant. Doctors and
Anaesthetic Technicians also reported an increase in confidence but this increase was not statistically significant. Participants who had attended further training since the study day reported higher levels of confidence than those who did not. More than half of the participants had not experienced an obstetric emergency since the study day however, there was no significant difference in retained confidence levels between those who had or had not.

Five themes emerged from evaluation of the qualitative data from free text comments and interviews. The five themes identified from the data illustrate the importance of teamwork, communication, leadership and inter-professional support during an emergency. These themes, together with the need to maintain learning and practice, are paramount for participants to feel confident in their role.

Chapter six will discuss these findings in relation to theory and other research findings.
Chapter 6 Discussion

6.1 Introduction

The literature affirms that team training and emergency drills are proven methods of delivering emergency obstetric and neonatal skills training. Bergh (2015) states that all health professionals should have initial training and undergo regular mandatory in-service training including emergency drills. Emergency training works and can improve quality of life and ultimately save lives.

6.2 Overview of the study

The aim of this study was to explore the influence of attendance at the newly developed Hospital Emergency Response – Obstetrics study day on participants’ reported confidence levels when confronted with an obstetric emergency at a later date.

Exploration was undertaken using a mixed methods approach involving a sample group of RNs, Drs and ATs. Quantitative data were collected through the C Scale questionnaire, before and after the HER-Obs study day. The C Scale was administered between two and eight months after the study day. Qualitative data were collected using one to one interviews and in the free text comments during both Phases.

The findings clearly answered the research question of: Following attendance at the HER-Obs study day, will the participants report an increase in confidence when confronted with an obstetric emergency? Statistical analysis showed there was an improvement in confidence levels of the participants, at the end of the study day and that confidence was maintained over time. The five themes identified in the previous chapter explored what elements contributed to the increased confidence levels.
The final chapter considers the research findings in light of the aim of the study and includes a comparison of these findings with other relevant published literature. Discussed are the researcher’s interpretations, based on the findings in Chapter five, addressing the research question and sub questions. Key aspects are discussed including the importance of interprofessional teamwork, communication and the need to maintain practicing skills. It concludes with identifying the limitations of this study and suggestions for further research.

6.3 Increase in confidence and confidence maintained

Results from the C Scale questionnaire showed that confidence had increased after attending the study day and this confidence was maintained up to eight months thereafter. Prior to the study day 31% (n=15) of the participants felt they had no, or minimal confidence, in recognising an obstetric emergency. After the study day when the C Scale questionnaire was repeated, all participants reported feeling fairly or very confident. Question two asked participants to rate their confidence to initiate management in the event of an obstetric emergency. Prior to the study day 61% (n=23) had no or minimal confidence, after the study day only 8% (n=3) expressed that they had no or minimal confidence, and at a later date 9% (n=2) had minimal confidence. The final question asked participants if they felt confident in knowing how to escalate care to the obstetric team. Initially 39% (n=12) had no or minimal confidence prior but all participants subsequently felt fairly or very confident to call for assistance when required. When the total confidence scores for all three time periods (before study day, after study day and at a later date) were analysed, only the RNs showed a significant improvement in confidence levels. This finding is important because the registered nurse is at the bedside and may often be the first responder in an obstetric emergency. The small sample size of Doctors (n=4) and Anaesthetic technicians (n=3) may have indicated there was not enough power to detect any differences across the three time periods.
Confidence can be maintained over time. Several studies have examined confidence and self-evaluation of knowledge and skills over a period of time and found that retention of knowledge and confidence can be maintained up to 15 months after the training has occurred. A descriptive study from Denmark evaluated the impact on obstetric emergency training on 147 doctors, midwives and auxiliary nurses (first session) and 192 (second session) before, after and at a later date after the training. The participants from all professions completed self-assessment of their confidence at the three study periods. A significant improvement in confidence was reported and maintained nine – 15 months after the training. Significant improvements in behaviour and changes in management (Kirkpatrick level four) were also reported. A prospective follow-up study from Portugal found that 54 obstetric nurses and obstetricians had a 89% improvement in reported knowledge and skills one year after completing simulation training for obstetric emergencies. If the participants had experienced an obstetric emergency since the training, they rated the impact of the training significantly higher than those that had not.

6.3.1 Sub question 1: Did having experience with an obstetric emergency after the study day affect confidence?

In this present study, 52% (n=12) of the participants had not encountered an obstetric emergency since the study day. There was no significant difference in the confidence levels between those who had experienced an obstetric emergency and those who had not. However, some participants commented that since they had not experienced an obstetric emergency that they felt they were losing confidence and knowledge. As obstetric emergencies in departments outside of the maternity unit are rare, this is a valid concern.
6.3.2 Sub Question 2: Did receiving further training after the study day influence confidence?

Only five (22%) of the participants had received further training in obstetric emergencies since attending the study day. What training they had received was not identified as the question required a yes / no response. Statistical analysis revealed that having attended further training significantly improved the reported level of confidence. Therefore, as training improves confidence, it is recommended that regular training is required for staff to maintain their confidence levels. Training options will be discussed later in this chapter.

Sections 6.4 to 6.6 address Sub Question 3: Were there other factors that influenced confidence?

6.4 Interprofessional teamwork and communication.

It was evident from interviewing the participants, that feeling confident in an obstetric emergency relied on more than just training and knowledge of obstetric procedures. Interprofessional teamwork and good communication was essential. If staff worked cohesively as a team and communication was clear and directed, participants felt confident that they had provided the best outcome possible in the circumstances of the emergency situation they experienced.

In any emergency situation, working together as a cohesive team is paramount. Failure to communicate effectively within a team has been identified as the primary root cause in over 70% of sentinel events. Effective communication and teamwork is aimed at creating a common mental model so that everyone knows what is supposed to happen and everyone feels safe to speak up if they have safety concerns. This concept was emphasised strongly on the study day.

Good teamwork and communication are vital. Both components work hand in hand as effective teamwork cannot be achieved without communication between the team members. Deficiencies
in communication and team training have been identified as the most common root causes for infant death in developed countries.⁶

Many studies have appraised the role of interprofessional education to encourage teamwork and communication. Amatullah (2017)¹⁰³ reviewed the evidence evaluating the effectiveness of simulation training in the management of obstetric emergencies. This review found that interprofessional teamwork training integrated with simulation was effective in the prevention of clinical errors and therefore the improvement in patient outcomes. One study¹⁰⁴ undertaken was a pilot study in the Netherlands involving 76 post-partum women before and 68 post-partum women after interprofessional simulation-based obstetric team training, reviewed patient-reported quality of care. Using a validated tool, results showed a significant increase in reported quality of care after the team training. A randomised controlled trial¹⁰⁵ in the United Kingdom involving 140 doctors and midwives compared the effectiveness of training for the management of eclampsia with or without teamwork theory and with low fidelity simulation in the hospital setting or with high fidelity simulation in a simulation centre. Results demonstrated that training enhanced performance, resulted in shorter times to administration of Magnesium Sulphate and improved teamwork. However, training in a simulation centre or with specific teamwork theory training did not show additional benefits. In contrast, a randomised controlled trial¹⁰⁶ from the Netherlands involving 74 teams of doctors, midwives and nurses from 12 hospitals, found a significant difference in communication and decision making within a team after receiving multidisciplinary teamwork training in obstetric emergencies. Collins and Draycott (2015) state that The Confidential Enquiries into Maternal Deaths (UK) and the Royal College of Obstetricians and Gynaecologists recommend interprofessional training to promote understanding of each other’s roles and to foster good teamwork and communication.¹⁰⁷
6.5 Reliance on the midwife

This study shows that the participants – both Doctors and Registered Nurses - stated that the presence of the midwife increased their confidence. The presence of the midwife at an emergency was looked upon to provide support to the RNs and Drs and guide the management of the obstetric emergency. This finding emphasises the importance of the midwife when an obstetric emergency occurs. Responses from the participants indicated that the participants valued the midwife’s support and respected her expertise. Midwives are present within the OT to provide care for the newborn infant, in ED they review admissions of pregnant women and visit women in the ICU to facilitate breast feeding of the infant. However, the midwife is not always present at the commencement of an obstetric emergency – especially if the emergency occurs within the ED or ICU departments. Ideally, a midwife should be available wherever an obstetric patient is being treated, but unless midwives are employed within the ED, OT or ICU this cannot be assured. Women presenting to the hospital with known obstetric issues report directly to the antenatal assessment unit, but if their presentation is for assumed non – obstetric reasons they are seen in the ED. A recommendation from this study is that all obstetric patients are seen in the maternity unit regardless of their presentation. However, the geographical layout of the hospital and availability of senior obstetric staff onsite (especially overnight) limits the possibility of this eventuating, at least in the short term. Currently, when the midwife is called to an emergency, the midwife was able to blend in to the team as a valued team member. An essential component of the study day was to emphasise the process for escalation of care to the midwives and obstetricians when an obstetric emergency is first noticed. In 2016, the hospital developed a series of emergency response codes to ensure that the right personnel are called to attend the emergency. All codes are directed to the hospital switch board via the same call number. For obstetric emergencies, once the switch board is called, a code blue obstetric emergency is sent to the obstetric team pagers. The responding team consist of an obstetrician, obstetric doctor, senior midwives and an anaesthetist. Knowledge and use of this alert system is vital to avoid
delays in treatment in an emergency situation. All clinicians are made aware of this alert system on orientation to the hospital, however, this study identified that some participants did not recall this. The study day and other obstetric emergency training mentioned later in this chapter provide a means of reminding participants of the importance of using the system to improve the outcomes for woman and their babies.

A cross sectional secondary analysis \(^{108}\) of the randomised controlled study for eclampsia management discussed earlier in this chapter, reported that the presence of experienced midwives in teams had been shown to significantly enhance a team’s performance in an obstetric emergency. Another study\(^ {109}\) of 60 resident doctors’ obstetric emergency management training showed that their scores at simulation were markedly higher if an experienced midwife was present.

6.6 Attributes of a strong leader

This aspect is viewed as a very important factor and increases the participants’ perceived confidence. Participants discussed how a calm, confident leader influenced the whole teams’ response during an emergency. The leader also needs to give clear directions to the team so that all involved know their role. Together with teamwork and communication, leadership was encouraged and discussed during feedback after the simulation scenarios on the study day. Time is of the essence when managing an emergency, therefore, having a confident leader reduces risk for the mother and fetus/baby. One participant mentioned that if the team leader is not identified from the outset of the emergency, the team becomes confused and the management becomes disorganised. The leadership, teamwork and communication skills practised and discussed on the study day are essential for the management of obstetric emergencies but can also be transferred into practice in any emergency participants encounter in their workplace.

A qualitative study with thematic analysis of interprofessional focus groups\(^ {71}\) investigated health care professionals’ beliefs about effective teamwork in medical emergencies based on their
experiences. In their experience, both doctors and nurses felt that optimal teamwork was dependant on good leadership and the availability of experienced staff. A good leader verbally declares themselves as the leader, communicates clear objectives and allocates critical tasks to the team members. These results are similar to the findings of this present study.

The next sections answer the Sub Question: Is the study day an effective way of increasing staff knowledge (and subsequent confidence)?

### 6.7 Study day opinions

Participants had the opportunity to provide anonymous comments on the questionnaire. In response to questions four and five on the questionnaire administered on completion of the study day:

**Question four. Would you recommend this study day to colleagues?**

**Question five. Do you think your obstetric management skills improved since attending the study day?**

All of the participants stated yes to both questions. This indicates that the study day was well received and of benefit to the participants’ confidence in their ability to respond in the event of an obstetric emergency. Moreover, all participants enjoyed the study day and felt it was beneficial to their learning needs and prepared them to manage an obstetric emergency. Participants recognised that obstetric emergencies were not a common occurrence in their area of work, however, having new or refreshed knowledge in obstetric emergencies was still important.

Participants also stated that they drew on the knowledge from the study day when confronted by an obstetric emergency after the study day. Those participants who had not experienced an obstetric emergency still perceived that the study day prepared them to deal with other
emergency situations. This response was supported by the findings that the total confidence score for participants was not significantly different whether they had experienced an obstetric emergency or not. This may reflect that the emphasis on teamwork and communication on the study day can be transferred to any clinical situation.

However, as discussed prior, knowledge is lost over time and needs to be repeated.\textsuperscript{57,100-102,110} Participants felt that there was an ongoing need to refresh skills learnt. Some suggested repeating the study day on a regular basis – for example annually and all of the clinical staff who work in the three areas should attend.

6.8 Suggestions for future training

This research has shown that the HER-Obs study day is of benefit to the participants and has influenced participant behaviour when confronted with an obstetric emergency at a later date. As such, this study day will continue to be offered twice or three times a year, to educate new staff and provide the opportunity to refresh knowledge for those who have previously attended.

There are benefits of providing in-house training days. Participants receive the training without the need to travel, and importantly, participate in teams with their own colleagues and learn in a familiar environment. Financial benefits to the participants are that they can attend the study day at zero cost to themselves. The cost to the organisation includes supporting a paid study leave day to participants, payment for the presenters and small consumable costs. For staff to attend an external training course incurs much higher costs to both the participant and the organisation.

The WA study by Maouris et al\textsuperscript{69} mentioned in the literature review, found that providing local study days were of benefit. The researchers believed that a combination of multi-disciplinary involvement in training, adaptability of the course to local needs and running the training in local hospitals were important factors in that program’s success in improving neonatal and obstetric outcomes.
Participants have suggested other methods of education to keep them up to date and therefore feeling confident to recognise, respond to and escalate care during an obstetric emergency. A common request was for regular simulated sessions of the various drills. This has been addressed at the hospital. The ED department holds simulation training for the junior doctors every Thursday morning. Nursing staff are now invited to participate if the department acuity permits. Obstetric scenarios have been written and added to the program. Insitu (department based) scenario sessions are being developed throughout the hospital to cover many clinical needs (for example; recognising and responding to various clinical deterioration scenarios such as sepsis, hypovolaemic shock or respiratory impairment). Extension of this program is planned to develop scenarios for obstetric emergencies – not only within the maternity unit but also in the OT and ICU.

Another request was for the inclusion of neonatal resuscitation. This is an emergency that can occur outside of the maternity unit and may occur in the ED or OT. The HER-Obs program has since been adapted to include a session on basic neonatal resuscitation skills and how staff can assist the experts during such an emergency.

Flow charts have been developed to assist staff in the steps required during an obstetric emergency. These charts are available in ED, ICU and OT as a quick reference during an emergency. A massive blood transfusion policy and an accompanying flow chart have also been developed for use during all emergencies where excessive blood loss management is required.

6.9 Limitations of the study

There are several limitations to this study. Firstly, the study was only carried out in one hospital setting and the involvement of a relatively small convenience (non-probability) sample group. This raised questions in relation to external validity and whether the study would be applicable in other settings. However, to strengthen the findings, participants represented all three departments involved in the study day. Participants were from both medical and nursing professions with a
wide range of experience - both within their profession and with experience of obstetric emergencies in the past.

As stated in Chapter five, whilst many obstetric complications occur outside of the maternity unit, the participants of this study may not have been on duty when one occurred. To this end, 52% (n=12) of the participants had not experienced an obstetric emergency at the time of the Phase two data collection. These participants therefore, were unable to comment on confidence when experiencing an obstetric emergency at a later date, only comment on how confident they thought they would be. A larger study involving only those participants who had experienced an obstetric emergency may have provided more robust responses to fully address the aim of the study.

Another limitation of the study is that the researcher designed and facilitated the study day as an educator within the hospital. This involvement may have influenced on the responses provided by the participants. The researcher attempted to control this bias by ensuring the questionnaires were de-identified to provide anonymity. Being known to some of the participants, some responses may have been given to please the researcher.

The changes of behaviour reported during the interviews (Level three evaluation) were related to the experiences of the participants. No direct observations of participants in practice were recorded. Whilst the interviews did provide rich data, the interviews were short. The participants were interviewed in an office at the hospital during a quiet work period identified by themselves. Richer data may have been gathered if the interviews took place outside of the participant’s work time when constraints may not have impinged on the interview time.

6.10 Suggestions for further research

This study evaluated the effect of the HER-Obs study day on participants’ perceived confidence when confronted by an obstetric emergency at a later date. To evaluate whether this study’s
findings are applicable externally, the HER-Obs study day program could be conducted in a larger hospital, therefore, a repeat study would involve a larger sample group.

The evaluation used the Kirkpatrick and Kirkpatrick evaluation model - levels one to three. To determine whether this training has made a significant impact on the outcomes for the pregnant woman and fetus/baby, and is of benefit to the organisation, further research is required utilising Kirkpatrick Level four.

There is limited research from Australia studying obstetric emergencies – especially its effect on non-obstetric trained staff. Further research into this area is required.

6.11 Conclusion

This chapter has discussed the findings of the research study in relation to the literature. It has identified areas for improvement and how these have been addressed by the hospital. Finally, it has identified the limitations and provided suggestions for further research.
7 References

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8 Appendices
Appendix 1: Program example

Hospital Emergency Response-Obstetrics program

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Area</th>
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<tbody>
<tr>
<td>0800 - 0810</td>
<td>Introduction &amp; Welcome</td>
<td>Lecture theatre</td>
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<tr>
<td>0810 - 0820</td>
<td>Questionnaire</td>
<td>Lecture theatre</td>
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<tr>
<td>0820 - 0835</td>
<td>Teamwork and communication discussion</td>
<td>Lecture theatre</td>
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<tr>
<td>0835 - 0900</td>
<td>Maternal Collapse discussion</td>
<td>Lecture theatre</td>
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<tr>
<td>0900 - 0930</td>
<td>Post-partum haemorrhage (PPH) Overview</td>
<td>Lecture theatre</td>
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<tr>
<td>0930 - 1000</td>
<td>PPH Massive transfusion</td>
<td>Lecture theatre</td>
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<tr>
<td>1000 - 1015</td>
<td>Morning Tea</td>
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<tr>
<td>1015 - 1045</td>
<td>PPH surgical management workshop</td>
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<tr>
<td>1045 - 1100</td>
<td>Teamwork activity</td>
<td>Lecture theatre</td>
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<tr>
<td>1100 - 1115</td>
<td>Room familiarisation</td>
<td>SIM room</td>
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<td>1115 - 1200</td>
<td>Simulation scenarios</td>
<td>SIM room</td>
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<td>1200 - 1230</td>
<td>Ante-partum haemorrhage case study</td>
<td>Lecture theatre</td>
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<td>1230 - 1315</td>
<td>Lunch</td>
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<td>1315 - 1345</td>
<td>Maternal collapse workshop</td>
<td>Lecture theatre</td>
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<td>1345 - 1400</td>
<td>Teamwork activity 2</td>
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<td>1400 - 1430</td>
<td>Pre- Eclampsia workshop</td>
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<td>1430 - 1515</td>
<td>Simulation scenarios</td>
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<td>1515 - 1545</td>
<td>Other emergency considerations discussion</td>
<td>Lecture theatre</td>
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<tr>
<td>1545 - 1550</td>
<td>Video – Preventing maternal morbidity and mortality</td>
<td>Lecture theatre</td>
</tr>
<tr>
<td>1550 - 1600</td>
<td>Teamwork activity 3</td>
<td>Lecture theatre</td>
</tr>
<tr>
<td>1600</td>
<td>Conclusion, questionnaire part 2, evaluation</td>
<td>Lecture theatre</td>
</tr>
</tbody>
</table>
Appendix 2: Example of a simulation scenario
Scenario: Recognising and Responding to a Primary Postpartum Haemorrhage

Learning Objectives
1. Identify a primary postpartum haemorrhage and demonstrate the correct management of a responding to a primary postpartum haemorrhage as per AKG policy
2. Demonstrates Effective Team work
3. Demonstrates Effective Communication

Clinical Setting & History:
I: Summer has just had a BBA of a live baby girl; she has just been brought into ED
S: Summer is having skin to skin time with her baby when she states she feels like she is leaking something
O: BP 110/80, Pulse 88bpm, Temp 36.8, SaO2 98%
B: Uncomplicated Pregnancy, SVD in her car, intact perineum, EBL 250mls. Placenta delivered. No IVC insitu
A: Upon examination you can see that Summer is sitting in a pool of blood. Immediate action is required
R: Immediate Action is required

<table>
<thead>
<tr>
<th>Findings</th>
<th>Desired Action</th>
<th>Clinical course</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bp: 110/80</td>
<td>Call for Assistance. Organise 2 x 16g IVC, take bloods for Group and crossmatch 4 units of blood, FBC, Coags. Commence IV fluids 1000mls CSL</td>
<td>A. 2 ED nurses will arrive. Continues to bleed</td>
</tr>
<tr>
<td>Pulse: 88bpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resp Rate: 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sao2: 98%RA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundus: Boggy and 3 fingers above umbilicus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBL: 1250mls</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP 90/60</td>
<td>Initiate a Code Blue Obstetric Emergency stating Code; name and location they must use</td>
<td>B. Help not called: Confederate who is the partner will start becoming distressed asking what is happening “Summer are you ok” “Why is she closing her eyes and not talking to me”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr will arrive. And the other 2 Nurses will arrive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Trauma present</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drugs will start to be administered</td>
</tr>
<tr>
<td>Findings</td>
<td>Desired Action</td>
<td>Clinical course</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>• Pulse 120bp</td>
<td>the telephone and speak to the Supervisor in control room (not just state this).</td>
<td>• If Bimanual compression started ensure theatre has been called so urgent transfer to theatre</td>
</tr>
<tr>
<td>• Resp rate 22</td>
<td>Comence O2 via Non rebreather</td>
<td>• If Obstetric Emergency not called Confederate to prompt staff saying “Where’s our Obstetrician Where’s our midwife”</td>
</tr>
<tr>
<td>• Sao2 94% RA</td>
<td>Activate the massive transfusion protocol must call control room pretend they are calling the Lab.</td>
<td>• If drugs not given: Bleeding to increase to 3000mls, patient will become drowsy</td>
</tr>
<tr>
<td>• Blood Loss: 1800mls</td>
<td>Drugs:</td>
<td>• Requested Estimated Blood Loss: If Massive Transfusion protocol not activated patient to deteriorate further Bp 80/50, Pulse 128bpm, state blood loss now 3000mls</td>
</tr>
<tr>
<td>• Fundus Boggy 3F above umbilicus</td>
<td>• Syntocinon 10u IM</td>
<td></td>
</tr>
<tr>
<td>• Summer responding to voice</td>
<td>• 40U Syntocinon in 500ml CSL commenced 250ml/hr IV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ergometrine 0.25mg IM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Misoprostal 1000mcg PR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Consider Antiemetic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Carboprost 250mcg IM repeated every 15minutes for 8 doses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tranexamic Acid 1g IV bolus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr to check for Trauma, may initiate Bimanual compression (need to state what happens next)</td>
<td></td>
</tr>
<tr>
<td>• Bp 80/50</td>
<td>Bimanual compression</td>
<td></td>
</tr>
<tr>
<td>• Pulse 140bp</td>
<td>Insert IDC – hourly measure bag</td>
<td></td>
</tr>
<tr>
<td>• Resp Rate 32</td>
<td>Check Placenta</td>
<td></td>
</tr>
<tr>
<td>• Sao2 88% RA or 96% on 15L non rebreather</td>
<td>Blood Loss weighed: 3000mls</td>
<td></td>
</tr>
<tr>
<td>• Fundus Boggy 3F above umbilicus – No clotting</td>
<td>Transfer to Theatre</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Need to Discuss ICU admission</td>
<td></td>
</tr>
<tr>
<td>A. Placenta not complete,</td>
<td>Need to state transfer to theatre</td>
<td></td>
</tr>
<tr>
<td>B. Not detected Incomplete Placenta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Not Initiating transfer to OT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State blood loss now 3500mls if still not organising transfer to OT then Summer to become unresponsive, and no recordable Bp</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Findings

<table>
<thead>
<tr>
<th>Findings</th>
<th>Desired Action</th>
<th>Clinical course</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blood Loss 3000mls</td>
<td></td>
<td>Cease Scenario after this</td>
</tr>
<tr>
<td>• Summer Drowsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>responding to pain.</td>
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</tbody>
</table>

Depending on action taken clinical course will be A or B

A. Clinical Management will continue, Summer will continue to bleed to give the opportunity for staff to practice the full management of a woman having a PPH. The scenario will end once the patient is transferred to theatre.

B. If clinical management of a PPH is not followed the Summer will deteriorate requiring resuscitation

### Discussion points

#### Technical Aspects:

- Identifying the deteriorating maternity patient, Recognising the signs post-partum haemorrhage
- Management of post-partum haemorrhage
- Documentation
- Escalation of Care – requesting help and Calling Code Blue Obstetrics
- Critical Thinking Skills: massive transfusion protocol activated

#### Crisis Resources Management

- Situational Awareness
- Role Allocation
- Communication
Appendix 3: Phase One survey

Questionnaire

Effective management of an Obstetric Emergency is critical to ensure the safety of mother and baby. The purpose of this survey therefore is to identify if the HER-Obs study day increases your confidence level when confronted with an obstetric emergency in the future.

Completing the survey should take you approximately 10 minutes. Completion of the survey will be seen as your consent to participate in this study.

This project is being conducted by me and will form the basis for the degree of Master in Health Professional Education at The University of Western Australia, under the supervision of Dr Zarrin Siddiqui and Dr Catherine Ward.

When you have completed the survey place it in envelope provided and post it in survey return box marked ‘Study day project’. This box is situated at the back of the room.

You will be invited to attend a one on one interview & complete a further questionnaire once you have experienced an obstetric emergency. It is envisaged that this will take place within 3 – 6 months. You can notify me by email when this event has occurred or I will contact you at 2 monthly intervals.

Thank you for your participation, it is much appreciated.

Debra Jeavons.

Contact details: Debra.jeavons@health.wa.gov.au

The study has been approved by the Human Research Ethics Committee at The University of Western Australia (approval number RA/4/1/8888) and also by the East Metropolitan Health Service Research Governance Service (approval number RGS000000096).
Please label your questionnaire with your mother’s maiden name initials for anonymity: ______________

The following questions are designed to collect demographic information about you. Please tick the box of the response which describes you.

1. I am 1. Male ☐ 2. Female ☐
2. Age: 1. 20–29 ☐
   2. 30–39 ☐
   3. 40–49 ☐
   4. 50–59 ☐
   5. 60 or over ☐
   2. Undergraduate ☐
   3. Post Graduate ☐
   4. Masters ☐
   5. Other - please specify  -----------------------------
4. Which professional group do you belong to?
   1. Registered Nurse ☐
   2. Enrolled Nurse ☐
   3. Anaesthetic Technician ☐
   4. Doctor ☐

Please turn over
Page 1
5. Were your qualifications for your professional group obtained in:
   1. Australia ☐
   2. Overseas? ☐

6. What department do you currently work in?
   1. Emergency Department ☐
   2. Operating Theatre ☐
   3. ICU ☐

7. How many years of experience do you have in your current role?
   1. Less than 1 year ☐
   2. 1 – 3 years ☐
   3. 3 – 5 years ☐
   4. More than 5 years ☐

8. Have you had previous experience with an obstetric emergency?
   1. Yes ☐
   2. No ☐
The following questions relate to your perceived confidence when confronted with an obstetric emergency. Please circle the number which best reflects your response.

1) I feel confident in recognising an obstetric emergency:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
</tr>
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</table>

2) I feel confident in commencing the initial management of an obstetric emergency:

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
</tr>
</tbody>
</table>

3) I know how to escalate obstetric emergency care to the Midwives and Obstetricians:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>No confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
</tr>
</tbody>
</table>
Please complete this page at the end of the study day:

1) I feel confident in recognising an obstetric emergency:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>3</th>
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2) I feel confident in commencing the initial management of an obstetric emergency:

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</thead>
<tbody>
<tr>
<td></td>
<td>No confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
</tr>
</tbody>
</table>

4) Would you recommend this study day to your colleagues?

1. Yes □
2. No □

5) Do you think your obstetric management skills improved since attending this study day?

1. Yes □
2. No □

Any further comments, please add below.

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
Page 4
Appendix 4: Phase Two survey

The information obtained from this questionnaire is deidentified for your anonymity. Please label your questionnaire with your mother’s maiden name initials for anonymity: _____________

The following questions are designed to collect demographic information about you. Please tick the box for the response which describes you.

1. I am 1. Male ☐ 2. Female ☐

2. Age:
   1. 20–29 ☐
   2. 30–39 ☐
   3. 40–49 ☐
   4. 50–59 ☐
   5. 60 or over ☐

3. Education Level:
   1. Certificate IV ☐
   2. Undergraduate ☐
   3. Post Graduate ☐
   4. Masters ☐
   5. Other - please specify -------------------------------------------

4. Which professional group do you belong to?
   1. Registered Nurse ☐
   2. Enrolled Nurse ☐
   3. Anaesthetic Technician ☐
   4. Doctor ☐
5. Which study day did you attend?

1. 13th October 2017 ☐
2. 8th December 2017 ☐
3. 17th March 2018 ☐

6. Were your qualifications for your professional group obtained in:

1. Australia ☐
2. Overseas? ☐

7. What department do you currently work in?

1. Emergency Department ☐
2. Operating Theatre ☐
3. Intensive Care Unit ☐

8. How many years of experience do you have in your current role?

1. Less than 1 year ☐
2. 1 – 3 years ☐
3. 3 – 5 years ☐
4. More than 5 years ☐

9. Did you have previous experience with an obstetric emergency prior to the study day?

1. Yes ☐
2. No ☐
The following questions relate to your perceived confidence when confronted with an obstetric emergency.

Please circle the number which best reflects your response.

1) I feel confident in recognising an obstetric emergency:

<table>
<thead>
<tr>
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<th>4</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>No Confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
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</tbody>
</table>

2) I feel confident in commencing the initial management of an obstetric emergency:

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<tbody>
<tr>
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<td>No Confidence</td>
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<td>Very confident</td>
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</tbody>
</table>

3) I know how to escalate obstetric emergency care to the Midwives and Obstetricians:

<table>
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<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No confidence</td>
<td>Minimal confidence</td>
<td>Fairly confident</td>
<td>Very confident</td>
</tr>
</tbody>
</table>

4. Do you think your obstetric management skills improved since attending the study day?
   1. Yes □
   2. No □

5. Have you attended any other obstetric training since attending the study day?
   1. Yes □
   2. No □

6. How long after the study day did you encounter an obstetric emergency?
   - Within 1 week □
   - Within 1 month □
   - Within 2 months □
   - Within 3 months □
   - Longer than 4 months □

Any further comments, please add over the page
This study has been approved by the Human Research Ethics Committee at The University of Western Australia (approval number RA/4/1/8888) and also by the East Metropolitan Health Service (approval number RGS000000096).
Appendix 5: Information letter

Debra Jeavons
Health Professions Education
The University of Western Australia
35 Stirling Highway, Crawley WA 6009
Email: debra.jeavons@health.wa.gov.au

Participant Information Form

Project title: Evaluating the Hospital Emergency Response – Obstetrics study day for staff confidence in obstetric emergencies.

Name of Researchers:
Debra Jeavons Masters by Research student. Supervised by Dr Zarrin Siddiqui and Dr Catherine Ward.

Invitation:
You are invited to participate in a project of evaluating the Hospital Emergency Response – Obstetrics study day. You are being asked to take part in this project because I would like to evaluate the course’s effectiveness from the perspective of the attendees.

Aim of the Study (What is the project about?)
This course is the first of its kind in Western Australia to provide specific education and simulation training in obstetric emergencies to the hospital staff who do not have an obstetric background. My aim is to evaluate whether this course increases the confidence of those staff when they encounter an obstetric emergency at a later date.

What does participation involve?
There are 2 phases to the research. Phase one will occur on the study day.

You will be required to complete a questionnaire at the beginning of the study day. This questionnaire consists of 2 parts: a) Questions regarding your current confidence in obstetric emergencies and b) demographic information.

At the end of the study day you will be asked to complete the confidence questionnaire again and provide any comments you wish. These questionnaires should only take 5 minutes each to complete.
Phase two will occur after you have experienced an obstetric emergency in your area of work after the study day. As these events are unpredictable, you will be invited to contact me via email once this has occurred. In the event of no response, I will contact you at 2 monthly intervals to see if you have experienced one. When you have experienced an obstetric emergency, I will invite you to attend a 30-minute interview at a quiet location within the hospital. At this interview you will be asked to repeat the confidence questionnaire and then discuss your experience through several guided questions. This interview will be audio taped.

**Voluntary Participation and Withdrawal from the Study**

Your participation in this project is completely voluntary. You can withdraw from the study at any time, without giving an explanation. Data will be destroyed after withdrawal unless otherwise agreed. There will be no consequences associated with your withdrawal.

**Your privacy**

Participation in this study and any information you provide will be treated in a confidential manner. The data collected from this project will be kept in a de-identified format, in a password protected computer for minimum seven years.

**Possible Benefits**

The results of the evaluation of this course will be used to evaluate whether the objectives of the course are met and if any changes to the program or need for extra training are identified.

**Possible Risks and Risk Management Plan**

This project is deemed to be low risk, however there may be a risk of evoking distress when discussing an emergency response. All participants are advised of the availability of free counselling sessions provided by the health service employee assistance programs. Pamphlets will be available at the study day and at the interview.

**Contacts**

If you would like to participate or discuss any aspect of this study please feel free to contact me either by email or phone 93912547.

Sincerely,

Debra Jeavons

**Chief Investigator**

Approval to conduct this research has been provided by the University of Western Australia with reference number RA/4/1/8888, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time. In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Ethics office at UWA on (08) 6488 4703 or by emailing to humanethics@uwa.edu.au. All research participants are entitled to retain a copy of any Participant Information Form and/or Participant Consent Form relating to this research project.
Participant Consent Form

Project title - Evaluating the Hospital Emergency Response – Obstetrics study day for staff confidence in obstetric emergencies.

I, __________ have read the information provided and any questions I have asked have been answered to my satisfaction. I agree to participate in this research project, realizing that I may withdraw at any time without reason and without prejudice.

I understand that all identifiable information that I provide is treated as confidential and will not be released by the investigator in any form that may identify me unless I have consented to this. The only exception to this principle of confidentiality is if this information is required by law to be released.

Face to face interviews will be used in phase 2 of the project and the conversations will be audiotaped.

I agree to have my conversation audiotaped. ☐

Participant signature ____________________________ Date ________________

Approval to conduct this research has been provided by the University of Western Australia, in accordance with its ethics review and approval procedures. Any person considering participation in this research project, or agreeing to participate, may raise any questions or issues with the researchers at any time. In addition, any person not satisfied with the response of researchers may raise ethics issues or concerns, and may make any complaints about this research project by contacting the Human Ethics Office at the University of Western Australia on (08) 6488 3703 or by emailing to humanethics@uwa.edu.au. All research participants are entitled to retain a copy of any Participant Information Form and/or Participant Consent Form relating to this research project.