Midwives' experiences of Shoulder Dystocia and investigation of its incidence rate: An exploratory sequential mixed methods study

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the degree of

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Under the supervision of:
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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Sonia Minooee declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.
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Signature:

Date: 10 May 2022

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Publications and Presentations Associated with This Thesis

This thesis is a compilation of published/ publishable manuscripts and thesis chapters. Four manuscripts have been published (Appendix 1). The published manuscripts include 1) a study protocol relevant to the topic of this thesis (Appendix 1) 2) a systematic scoping review (chapter two) and 3) two results chapters (chapters four and five). Findings of this thesis have also been presented at three virtual conferences (due to the outbreak of the Covid-19 pandemic in 2020-2021) (Appendix 2) and two UTS student forums/conference.

Publications

1. Minooee, S., Cummins, A., Foureur, M., Travaglia, J. 2021, 'Shoulder dystocia: A panic station or an opportunity for post-traumatic growth?', *Midwifery*, vol. 101, p. 103044.
2. Minooee, S., Cummins, A., Foureur, M., Travaglia, J. 2021, 'Catastrophic thinking: Is it the legacy of traumatic births? Midwives' experiences of shoulder dystocia complicated births', *Women and Birth*, vol. 34, pp. e38-e46.
3. Minooee, S., Cummins, A., Sims, D. J., Foureur, M., Travaglia, J. 2020, 'Scoping review of the impact of birth trauma on clinical decisions of midwives', *Journal of Evaluation in Clinical Practice*, vol. 26, pp.1270-1279.
4. Minooee, S., Cummins, A., Foureur, M. 2018, 'Shoulder dystocia and range of head-body delivery interval (HBDI): The association between prolonged HBDI and

neonatal outcomes: Protocol for a systematic review', *European Journal of Obstetrics and Gynaecology and Reproductive Biology*, vol. 229, pp. 82-87.

Presentations

1- Minooee S, Cummins A, Foureur M, Travaglia J. Long-term consequences of traumatic birth experiences for midwives. London Maternity and Midwifery Festival. January 2021 (virtual conference- oral presentation).

2- Minooee S, Cummins A, Foureur M, Travaglia J. Shoulder Dystocia: A traumatic birth experience with potential positive impacts on clinical practice of midwives. 24th Annual Congress of the Perinatal Society of Australia and New Zealand (PSANZ), Bridging Gaps in Perinatal Care. April 2021 Sydney (poster presentation, abstract has been published in the Journal of Paediatric and Child Health: the official journal of the Paediatrics and Child Health Division (The Royal Australasian College of Physicians))

3- Minooee S, Cummins A, Foureur M, Travaglia J. Towards professional growth or towards hypervigilance? Midwives' experiences of births complicated by shoulder dystocia. 15th Normal Labour and Birth Research Conference. December 2020 India (virtual conference- poster presentation)

4- Minooee S, Cummins A, Foureur M, Travaglia J. Long term impacts of traumatic birth experiences on clinical practice of midwives (Midwives' experiences of births complicated with shoulder dystocia). Faculty of Health, UTS, Research Student Conference. Spring 2020 (virtual conference- poster presentation)

5- Minooee S, Cummins A, Foureur M, Travaglia J. Shoulder dystocia; A Birth Emergency for Neonate, Mother and Midwife. Faculty of Health, UTS, Research Student Forum. Autumn 2019 (poster presentation)

Contributions of each co-author to publications:

1. Minooee S, Cummins A, Foureur M, Travaglia J. Shoulder dystocia: A panic station or an opportunity for post-traumatic growth?

Incorporated as chapter five

Area of contribution	**Percentage of contribution**
Concept and design of the study	SM 70%; AC 10%; MF 10%; JT 10%
Supervision and conduct of research	AC 30%; MF 35%; JT 35%
Data analysis and interpretation	SM 70%; AC 10%; MF 10%; JT 10%
Writing of the initial manuscript	SM 85%; AC 5%; MF 5%; JT 5%
Manuscript revisions	SM 70%; AC 10%; MF 10%; JT 10%

2. Minooee S, Cummins A, Foureur M, Travaglia J. Catastrophic thinking: Is it the legacy of traumatic births? Midwives' experiences of shoulder dystocia complicated births. Women and Birth. 2020

Incorporated as chapter four

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Supervision and conduct of research	AC 30%; MF 35%; JT 35%
Data analysis and interpretation	SM 70%; AC 10%; MF 10%; JT 10%
Writing of the initial manuscript	SM 85%; AC 5%; MF 5%; JT 5%
Manuscript revisions	SM 70%; AC 10%; MF 10%; JT 10%

3. Minooee S, Cummins A, Sims DJ, Foureur M, Travaglia J. Scoping review of the impact of birth trauma on clinical decisions of midwives. Journal of Evaluation in Clinical Practice. 2020

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Concept and design of the study	SM 70%; AC 10%; DS 0%; MF 15%; JT 10%
Supervision and conduct of research	AC 20%; MF 40%; JT 40%
Data analysis and interpretation	

Area of contribution	Percentage of contribution
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Writing of the initial manuscript	SM 85%; AC 5%; DS 5%; MF 5%; JT 5%
Manuscript revisions	SM 80%; AC 5%; DS 5%; MF 5%; JT 5%

4. Minooee S, Cummins A, Foureur M. Shoulder dystocia and range of head-body delivery interval (HBDI): The association between prolonged HBDI and neonatal outcomes: Protocol for a systematic review. European Journal of Obstetrics and Gynaecology and Reproductive Biology

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Data analysis and interpretation	Not required
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Manuscript revisions	SM 70%; AC 15%; MF 15%

Table of Contents

Abbreviations

ABS: Australian Bureau of Statistics

ACM: Australian College of Midwives

ACOG: American College of Obstetricians and Gynaecologists

ACT: Australian Capital Territory

AIHW: Australian Institute of Health and Welfare

ALSO: Advanced Life Support in Obstetrics

APDC: Admitted Patients Data Collection

APGAR: Appearance, Pulse, Grimace, Activity, and Respiration

BMI: Body Mass Index

CI: Confidence Interval

EAP: Employee Assistance Program

GDM: Gestational Diabetes Mellitus

Gm: Gram

HBDI: Head-to-Body Delivery Interval

HIE: Hypoxic-Ischaemic Encephalopathy

HREC: Human Research Ethics Committee

IEO: Index of Education and Occupation

IER: Index of Economic Resources

IRSAD: Index of Relative Socio-economic Advantage and Disadvantage

IRSD: Index of Relative Socio-economic Disadvantage

LHD: Local Health District

LMIC: Low and Middle Income Countries

MDC: Midwives Data Collection

NICE: National Institute for Health and Care Excellence

NICU: Neonatal Intensive Care Unit

NSW: New South Wales

NT: Northern Territory

OR: Odds Ratio

PDC: Perinatal Data Collection

PTG: Post-Traumatic Growth

PTSD: Post-Traumatic Stress Disorder

PROMPT: Practical Obstetric Multi-Professional Training

RANZCOG: Royal Australian and New Zealand College of Obstetricians and Gynaecologists

RCOG: Royal College of Obstetricians and Gynaecologists

RCT: Randomized Controlled Trial

RDMP: Research Data Management Plan

SCN: Special Care Nursery

SD: Shoulder Dystocia

SEIFA: Socio-Economic Indexes for Areas

SPSS: Statistical Package for the Social Sciences

SSA: Site Specific Assessment

STS: Secondary Traumatic Stress

UK: United Kingdom

US: United States of America

UTS: University of Technology Sydney

WHELM Study: Work, Health and Emotional Lives of Midwives Study

Glossary

Avoidance (in PTSD): Escaping from anything (thoughts, feelings, places, conversations, situations) which reminds the individual of the trauma.

Brachial plexus palsy: Injury of the neonate's brachial plexus at birth which may include Erb-Duchenne palsy (damage to the C5-6 nerve roots) or Klumpke palsy (damage to the C8-T1 nerve roots).

Burnout: Physical and emotional exhaustion due to chronic occupational stress.

Compassion fatigue: A state in which the clinician feels less empathic with the patient[1] and their sense of satisfaction with work diminishes.

Crowning: Emergence of the baby's head through the vaginal opening until it stays stationary and does not retract with uterine contractions.

Defensiveness (defensive practice): Clinician's attempt to avoid litigation through performing procedures which reduce medical uncertainty, but may not be appropriate.

Emotion work/ Emotional labour: Regulating emotions to fulfil organisational goals.

Fourth degree perineal tear: An injury to the rectal mucosa during vaginal birth.

Gaskin manoeuvre: Moving the labouring woman to her hands and knees.

Head-to-body delivery interval: The interval between the extraction of the baby's head and shoulders during a vaginal birth.

Hyperarousal (in PTSD): One of the criteria for the diagnosis of PTSD which is defined as hypervigilance and a state of exaggerated startle response.

Hypoxic ischemic encephalopathy: Serious neonatal brain injury caused by oxygen deprivation during prenatal, intrapartum or postnatal periods.

Iatrogenic injury: Injuries caused by medical treatment or the application of medical devices.

Intrusion: Recurrent involuntary distressing memories in PTSD.

Macrosomia: Birthweight of 4,000 gram or more.

[1] The word 'patient' is used only to refer to broad definitions which include all people regardless of their gender. Throughout the thesis, except for broad definitions, the word 'woman' is used to refer to women during the period of pregnancy, labour and postpartum.

McRoberts and suprapubic pressure manoeuvres: Hyperextending the birthing woman's legs onto her abdomen and simultaneously providing suprapubic pressure to assist the fetus in adducting the arms closer to the body in an attempt to release the impacted shoulders

Perineal trauma: Spontaneous or intentional (episiotomy) injury to the perineum during childbirth.

Posterior Arm Removal Manoeuver: Grasping the hand, moving the arm gently in a sweeping motion across the fetal chest, over the head and outside the vagina.

Postpartum haemorrhage: Estimated blood loss of ≥ 500 mL in vaginal birth or ≥ 1,000 mL in caesarean section.

Post-traumatic growth: Positive transformation in the aftermath of challenging events.

Post-traumatic stress disorder (PTSD): A mental disorder which develops due to failure in recovery after a traumatic event.

Primary traumatic stress: Stress due to direct experience or witness of trauma.

Reverse Woods Screw Manoeuver: Performed following an unsuccessful Woods Screw manoeuver by rotating the fetal body in the opposite direction by placing the fingers behind the posterior scapula.

Rubin Manoeuver: Placing fingers behind the anterior scapula and attempting to rotate the baby forward so that the shoulders are more likely to be in an oblique position.

Secondary traumatic stress: Clinicians' stress due their knowledge of others' trauma and their desire to help them.

Second victim: Healthcare professionals who are involved in a medical error, a patient safety incident or an unexpected health event and as a result of the incident they are personally and/or professionally affected.

Symphysiotomy: Mechanical widening of the pelvic outlet by separating the pubic symphysis.

Third degree perineal tear: An injury to the anal sphincter muscle during vaginal birth.

Transient femoral neuropathy: Transient femoral nerve injury due to the pressure from the overlying inguinal ligament during the McRoberts' manoeuvre.

Woods Screw Manoeuver: Placing fingers of one hand behind the fetal anterior scapula, and fingers of the other hand in front of the posterior arm, and attempting to rotate the baby in a counter-clockwise direction.

Zavanelli manoeuvre: The clinician's hand pushes the head of the partially born fetus back into the vagina, and extracts the baby by caesarean section.

Abstract

Introduction

Shoulder dystocia (SD) is known as one of the most traumatic birth experiences for midwives. Experience of a traumatic birth such as SD may cause emotional disturbances or in severe cases, mental health disorders for clinicians. It is well established that emotions can influence behaviours. However, evidence is limited on the professional behavioural consequences for midwives who experience births complicated by SD. This thesis explored the experiences of midwives regarding SD and the potential impact of such births on their clinical practice. In addition, I investigated the incidence and trends of SD, its risk factors and outcomes at one tertiary referral hospital in New South Wales (NSW), Australia over the period 2013-2018.

Methods

A two-phase sequential exploratory mixed methods study was conducted. The first phase included a qualitative descriptive study that consisted of semi-structured telephone/Zoom interviews with midwives who had experienced at least one case of SD in their career. A purposive sampling method was employed. Midwives were invited to the study through an invitation email sent by the Australian College of Midwives to its members. Thematic data analysis with an inductive approach was used to analyse the data. The second phase was a retrospective medical record review using de-identified data from one tertiary referral hospital in Sydney, NSW. Descriptive and inferential statistics were used to analyse data using IBM SPSS 27 software.

Results

For the first phase, a total of 25 midwives participated in the study. The core themes that emerged from the data were labelled 1) an unforgettable birth; a wake-up call 2) putting on a brave face 3) from passion to caution 4) factors worsening the experience 5) factors soothing the experience 6) towards the growth zone, and 7) I am resilient enough to recover. Midwives viewed SD as a traumatic birth associated with panic and anxiety. Following the

event, the pathways of thinking and practising were not similar among all midwives. Fear of repetition of the incident and negative thoughts after the experience shifted some midwives towards catastrophic thinking and hypervigilant behaviours. However, for some other midwives, SD was viewed as an opportunity to grow and to actualise their potential midwifery skills. A range of factors determined how midwives perceived SD and how they dealt with the event. These influencing factors included the model of care, the birth outcome, the midwives' sense of being judged or valued, having faith in birth normality and the workplace culture. Results from the second phase of the study showed that the overall incidence of SD was 6% among live births. Diagnosis of mild SD showed an increasing trend from 2013 to 2018. Binary logistic regression showed that SD was significantly associated with some antenatal and intrapartum risk factors, including post-term pregnancy (OR: 1.36, 95% CI: 1.29-1.44), maternal pre-existing diabetes/ Gestational Diabetes Mellitus (GDM) (OR: 1.57, 95% CI: 1.05-1.27), labour induction/ augmentation (OR: 1.63, 95% CI: 1.40-1.90) and duration of second stage of labour (more than two hours) (OR: 2.80, 95% CI: 2.40-3.27). The main maternal and neonatal adverse outcomes associated with SD were higher rate of postpartum haemorrhage (p-value <0.0001), APGAR score< 7 at the 1st and 5th minute (p-value <0.0001), and higher rates of neonatal resuscitation and admission to Neonatal Intensive Care Unit (NICU) (p-value <0.0001).

Conclusion

This study provided a snapshot of the incidence of shoulder dystocia at one metropolitan Australian hospital but importantly showed the insights about the emotional and professional impact of SD on midwives. It demonstrated that midwives' emotions (from previous experiences) can affect how they perceive normal birth, how they practise at birth and how they diagnose SD. The findings highlighted the need for further workplace and collegial support. Further, midwives are recommended to take up opportunities for ongoing reflection on their experiences and clinical performance to check if (un)consciously, they may have been affected by previous traumatic birth experiences. In addition, the increasing trend of SD is an alarm signal that suggests provision of further supports for midwives who may frequently be exposed to SD-complicated births are necessary.