



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

**AVAILABILITY AND QUALITY OF EMERGENCY OBSTETRIC CARE AMONG HEALTH
FACILITIES IN ETHIOPIA**

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**A Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of
Philosophy in Reproductive Medicine**

November 2020
The University of Newcastle, Australia

DECLARATIONS

Statement of originality

“I hereby certify that the work embodied in this thesis is my own work, conducted under normal supervision. The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made. I give consent to the final version of my thesis being made available worldwide when deposited in the University’s Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo”.

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I hereby certify that the work embodied in this thesis contains published papers of which I am a corresponding author. I have included as part of this thesis a written statement, endorsed by all of the co-authors, attesting to my contribution to the joint publications.

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Thesis by publication

I hereby certify that this thesis is in the form of a series of papers. I have included as part of the thesis a written declaration from each co-author, endorsed in writing by the Faculty Assistant Dean (Research Training), attesting to my contribution to any jointly authored papers.

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By signing below, I confirm that Ayele Geleto Bali contributed [conceptualization, proposal development, data collection, analysis and interpretation and manuscript writing] to the papers/publications detailed below.

1. **Ayele Geleto**, Catherine Chojenta, Abdulbasit Musa, Deborah Loxton. Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa—a systematic review protocol. *BMC Systematic Reviews* (2018) 7:60.
2. **Ayele Geleto**, Catherine Chojenta, Abdulbasit Musa, Deborah Loxton. Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa—a systematic review of literature. *BMC Systematic Reviews* (2018) 7:183.
3. **Ayele Geleto**, Catherine Chojenta, Abdulbasit Musa, Deborah Loxton. WOMEN's Knowledge of Obstetric Danger signs in Ethiopia (WOMEN's KODE): a systematic review and meta-analysis. *BMC Systematic Reviews* (2019), 8:63.
4. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele, Deborah Loxton. Incidence of maternal near miss among women in labour admitted to hospitals in Ethiopia. *Midwifery: March 2020 Volume 82*, 102597.
5. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele and Deborah Loxton. Association between maternal mortality and caesarean section in Ethiopia: a national cross-sectional study. *BMC Pregnancy and Childbirth* (2020) 20:588.
6. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele, Deborah Loxton. Magnitude and determinants of the direct obstetric case fatality rates among women admitted to hospitals in Ethiopia. *BMC Pregnancy and Childbirth* (2020) 20:130.
7. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele, Deborah Loxton. Perceptions of midwives on the quality of emergency obstetric care at hospitals in Ethiopia: A qualitative explanatory study. *Midwifery: November 2020, Volume 90*, 102814.

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11 November 2020

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1. **Ayele Geleto**, Catherine Chojenta, Abdulbasit Musa, Deborah Loxton. Barriers to access and utilization of emergency obstetric care at health facilities in sub-Saharan Africa—a systematic review protocol. *BMC Systematic Reviews* (2018) 7:60.
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5. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele and Deborah Loxton. Association between maternal mortality and caesarean section in Ethiopia: a national cross-sectional study. *BMC Pregnancy and Childbirth* (2020) 20:588.
6. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele and Deborah Loxton. Magnitude and determinants of obstetric case fatality rate among women with the direct causes of maternal deaths in Ethiopia: a national cross-sectional study. *BMC Pregnancy and Childbirth* (2020) 20:130.
7. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele, Deborah Loxton. Perceptions of midwives on the quality of emergency obstetric care at hospitals in Ethiopia: A qualitative explanatory study. *Midwifery: November 2020, Volume 90*, 102814, (Appendix X).

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Other thesis-related outcomes

Journal articles

1. Chaltu Yasin, **Ayele Geleto** and Yemane Berhane. Referral linkage among public health facilities in Ethiopia: A qualitative explanatory study of facilitators and barriers for emergency obstetric referral in Addis Ababa city administration. *Midwifery* 79 (2019) 102528.
2. Abdulbasit Musa, Catherine Chojenta, **Ayele Geleto** and Deborah Loxton. The associations between intimate partner violence and maternal health care service utilization: a systematic review and meta-analysis. *BMC Women's Health* (2019) 19:36

Conferences

1. **Ayele Geleto**, Catherine Chojenta, Abdulbasit Musa, Deborah Loxton. WOMEN's Knowledge of Obstetric Danger signs in Ethiopia (WOMEN's KODE): a systematic review and meta-analysis. *Ethiopian Public Health Association, Addis Ababa, Ethiopia, during February 26-28/2018 (Oral presentation)*.
2. **Ayele Geleto**, Catherine Chojenta, Tefera Taddele, Deborah Loxton. Magnitude and determinants of the direct obstetric case fatality rates among women admitted to hospitals in Ethiopia. *Ethiopian Society of Obstetrics and Gynaecology, Addis Ababa, Ethiopia, during February 16-18/2020 (Oral presentation)*.

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- Biostatistics A (6910)
- Biostatistics B (6920)
- Categorical Data Management and Generalized Linear Model (6940)
- Qualitative Methods in Health Research (6210)
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Conflict of interest

“I hereby declare that there are no conflicts of interests.”

Ayele Geleto Bali

11 November 2020

ACKNOWLEDGEMENTS

First, and most importantly, I would like to thank my almighty God for helping me at all stages of my journey to reach this level in my career. Next, I would like to acknowledge the Australian government and the University of Newcastle for providing me with a full scholarship to study my PhD. My special thanks go to the Deputy Vice-Chancellor (Research and Innovation) for their partial support of this research project. I would like to extend my heartfelt acknowledgements to my supervisors, Doctor Catherine Chojenta and Professor Deborah Loxton, for their invaluable contributions throughout my PhD study that represents a milestone in my career. Your tremendous support and guidance throughout my study assisted me to realise my career dream. My PhD, which would have been impossible to achieve without your help and close supervision.

Dear Cath, I remember my happiness when you accepted my request to supervise my PhD study at the University of Newcastle—an internationally recognised university. Your first response to my request, which was very positive and welcoming, encouraged me to finalise my application for admission as an international student under your supervision. I understand that it is difficult to accept a supervision request from someone whom you do not know in person. However, you were optimistic about me and accepted my supervision request without hesitation—thank you very much for believing in me. My gratitude for your patience and continuous motivation to improve my research skills throughout my studies is immense. Thank you, Cath, for encouraging me to grow as a researcher throughout my PhD career. I learned much from your positive feedback, incredible advice, dedication and timely responses to each of my requests. I appreciate all the professional advice you provided throughout my study—all I can do is say ‘thank you’, sincerely.

Deb, I would like to thank you for your continuous support and dedicated professional mentoring, guidance and encouragement, which have shaped me to become what I am today. Your invaluable comments and advice throughout every step of my study have helped me to grow professionally. Crucially, you shaped me to become a researcher who confidently works for the improvement of public health. Your mature and professional guidance assisted me to enrich all papers included in this research project and to improve all aspects of the thesis. The support you gave me during my work cannot be repaid—only with thanks, and this is beyond expressing with words. You motivated me to work and shaped the ways I can and will contribute to the field of public health. You were always there to assist me with any aspect of the research project, with no restrictions on time and place. Your positive outlook and confidence in my research inspired me greatly and gave me further courage. I cannot express how much you have helped me—you are special to me.

In my research, I used a representative national dataset available at the Ethiopian Public Health Institute; I wish to extend my special gratitude to the Ethiopian Public Health Institute for their permission to access the secondary data used in Chapters 6 through 8. I would like to thank the researchers who conducted the national survey titled ‘Assessment of emergency obstetric and newborn care in Ethiopia’

for their dedication and commitment during the data collection period. I would also like to extend my appreciation to the participating hospitals, data collectors, supervisors and partners who cooperated during the data collection process, in addition to those who funded the ‘national survey’. I also thank the interviewers, supervisors and the participants of the qualitative study for their cooperation during data collection.

I extend my thanks to the Faculty librarian, Debbie Booth, for her supportive and friendly contributions during the literature review, which was used throughout this study. I would like to thank Doctor Ryan O’Neill and Natalia Soeters for reviewing this document for English language usage and the proofreading of the manuscripts included in this study. My heartfelt thanks go to all staff of the Research Centre for Generational Health and Aging, School of Medicine and Public Health, for all the continuous support they provided me with, especially Ryan Tuckerman for IT support and Katherine Tuckerman and Clare Thomson for administration support. Finally, yet importantly, I also appreciate Haramaya University for facilitating my study by providing me with study leave. Capstone Editing provided copyediting and proofreading services, according to the guidelines laid out in the university-endorsed national ‘Guidelines for Editing Research Theses’.

I would also like to thank my family. Most importantly, my mum experienced discomfort when I was away from her; she always prays for my security. She cried when I began my time abroad for study. Mum, I have no words to express my gratitude to you for the sacrifices you have made for me since my childhood. Thank you very much for your unconditional love and consistent support throughout my life. Thanks, Dad, for your support and consistent help throughout my career development, although I did not have the chance to see you alive during this final stage of my career. Dad, I have only three words to say at this stage: ‘Rest in peace’. Thank you to all my brothers and sisters and all family members—your encouragement and prayers helped me during the difficult times. Finally, I wholeheartedly thank my lovely wife, Amerti. During my study, Amuu has been overburdened by caring for our kids, Webi and Beritina, in addition to her own work and study. Your encouragement, support and prayers strengthened me to finish my PhD. Altogether, you are the reason for my success. Webi and Beritina, I was usually relieved of tension and depression when we had our video chats. Your farewell ceremonies when I was leaving for Australia, although you had no chance to travel with me, were unforgettable. You often waved your hands while I was crossing the borderline (entering the airport) and you held flowers to welcome me upon my returns—these moments were unforgettable and well appreciated. Thank you, my kids, for those incredible events.

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ABBREVIATIONS

AFI	Acute Febrile Illness
AIDS	Acquired Immunodeficiency Syndrome
AMDD	Averting Maternal Death and Disability
AMTSL	Active Management of Third Stage of Labour
ANC	Antenatal Care
ART	Antiretroviral Therapy
AVD	Assisted Vaginal Delivery
BEmOC	Basic Emergency Obstetric Care
BMC	Biomedical Central
CEmOC	Comprehensive Emergency Obstetric Care
CINHAL	Cumulative Index to Nursing and Allied Health Literature
CS	Caesarean Section
DOCFR	Direct Obstetric Case Fatality Rate
EDHS	Ethiopian Demographic and Health Survey
EMA	Ethiopian Midwives Association
EmOC	Emergency Obstetric Care
EmONC	Emergency Obstetric and Newborn Care
EPHI	Ethiopian Public Health Institute
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
HC	Health Centre
HCW	Health Care Worker
HEW	Health Extension Worker
HIV	Human Immunodeficiency Virus
HP	Health Post
HSTP	Health Sector Transformation Plan
ICD	International Classification of Diseases
JB	Joanna Briggs Institute
JHPIEGO	Johns Hopkins Program for International Education in Gynaecology and Obstetrics
LTCs	Life-Threatening Complications
MDG	Millennium Development Goal
MDSR	Maternal Death Surveillance and Response
MI	Mortality Index
MMAT	Mixed Method Appraisal Tool

MMR	Maternal Mortality Ratio
MNM	Maternal Near Miss
MNMIR	Maternal Near Miss Incidence Ratio
MOH	Ministry of Health
MOOSE	Meta-Analysis of Observational Studies in Epidemiology
NGO	Non-Governmental Organization
PHCU	Primary Health Care Unit
PICOS	Participant Intervention Comparison Outcome Setting
PNC	Postnatal Care
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROSPERO	Prospective Register of Systematic Reviews
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goal
SNNPR	Southern Nations, Nationalities and People's Region
SSA	Sub-Saharan Africa
SVD	Spontaneous Vaginal Delivery
TBA	Traditional Birth Attendant
TLTL	Too Little Too Late
TMTS	Too Much Too Soon
TWG	Technical Working Group
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USD	United States Dollar
WHO	World Health Organization
KODE	Knowledge of Obstetric Danger Signs in Ethiopia

ABSTRACT

Introduction: In sub-Saharan African countries, where two-thirds of global maternal deaths occur, obstetric complications remain the major health threat for women. Ethiopia is among the countries with the highest maternal deaths in the world. The high maternal mortality ratio is mainly attributed to poor access and quality of emergency obstetric care (EmOC). However, there is a scarcity of literature on the availability and quality of EmOC in Ethiopia. Therefore, this thesis aimed to assess the availability and quality of EmOC in health facilities in Ethiopia.

Methods: This thesis employed a mixed methods approach where a combination of systematic reviews, meta-analysis, quantitative and qualitative studies were conducted. Initially, systematic reviews and meta-analysis were conducted to identify barriers to access to and utilisation of EmOC, and women's knowledge about obstetric danger signs. Then, three quantitative studies were conducted using a representative dataset accessed from the Ethiopian Public Health Institute to determine the availability and quality of EmOC in hospitals. The data used in this thesis were collected in 2016 as part of a national assessment of emergency obstetric and newborn care in Ethiopia. Finally, a complementary qualitative study was conducted in hospitals to assess midwives' perceptions about the quality of EmOC.

Results: In SSA, several factors that were seen at all levels of care affected women's access to and utilisation of EmOC. The pooled random effect meta-analysis revealed that only 48%, 43% and 32% of women know about obstetric danger signs that could happen during pregnancy, delivery and the immediate postpartum period, respectively. This study also demonstrated that, at the national level, maternal near miss incidence ratio and mortality index were 20.8% and 0.64%, respectively. The overall maternal mortality ratio in Ethiopian hospitals was 149 (95% CI: 136–162) per 100,000 live births while the annual caesarean section rate and the DOCFR in hospitals were 20.3% (95% CI: 20.2–20.5) and 0.64% (95% CI: 0.58–0.70%) respectively. However, there were significant regional variations in the magnitudes of these indicators. The findings of the qualitative study also revealed that a shortage of health infrastructure, insufficiency in trained providers, a shortage of medical supplies and essential drugs and poor management of services delivery affected the quality of EmOC.

Conclusions: In sub-Saharan Africa, several interdependent barriers that exist at multiple levels—either at home, on the way to health facilities or at the facilities—hampered access to and utilisation of EmOC for women in need. The observed regional disparities in the DOCFR, maternal near miss incidence ratio and mortality index indicate regional variation in the quality of EmOC. This necessitates the equitable distribution of health resources, strengthening maternal health interventions and quality improvement initiatives to tackle the observed regional variations. There is also a need for holistic strategies, including improvements to healthcare systems and the socio-economic status of women.