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Tern, Helena

2023

*Document Version:*
Publisher's PDF, also known as Version of record

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Printed by Media-Tryck, Lund 2023 NORDIC SWAN ECOLABEL 3041 0903

**HELENA TERN**, RN, RM, MSc in Public Health Science, conducted the work presented in this doctoral thesis at the Department of Health Sciences at Lund University, Sweden.

LUND UNIVERSITY

FACULTY OF MEDICINE

Department of Health Sciences

Lund University, Faculty of Medicine
Doctoral Dissertation Series 2023:145
ISBN 978-91-8021-487-2
ISSN 1652-8220

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LUND
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DOCTORAL DISSERTATION

By due permission of the Faculty of Medicine, Lund University, Sweden.
To be defended on 15th of December at 08.30 am in the Agardh Lecture Hall,
Department of Clinical Research Centre, Jan Waldenströms gata 35, Malmö.

*Faculty opponent*
Marie Berg, Professor, University of Gothenburg

**Organisation:** LUND UNIVERSITY
Department of Health Sciences
Faculty of Medicine

**Document name:** DOCTORAL DISSERTATION

**Date of issue:** 2023-12-15

**Author:** Helena Tern

**Title:** Collegial midwifery assistance during the active second stage of labour

**Abstract**

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Paper I has a qualitative design, using reflexive thematic analysis based on five focus group interviews with midwives (n=37). Papers II, III, and IV have quantitative designs using data from the Oneplus trial. In Papers II and IV, data was collected from clinical registration forms (CRFs) completed by the primary and second midwife after each birth (n=1430) and local databases. Paper III is a cohort study based on data from a questionnaire completed by women one-month postpartum, local databases, and CRFs (n=1050). For Papers II, III, and IV, we performed descriptive statistics as well as univariable and multivariable logistic regression analyses.

In Paper I, four key themes were constructed: (i) *challenging the professional role*, (ii) *a balancing act between different roles*, (iii) *not just why and how - but who,* (iv) *a potential arena for learning*. In Paper II, the majority of the midwives fully agreed on items related to perceived confidence and considered having a colleague present to be a positive experience (61% and 56% respectively). Midwives with less than two years of work experience were more likely to fully agree on feeling confident (aOR 9.18, 95% CI 6.28-13.41) and experiencing the presence of a colleague as positive (aOR 4.04 % CI 2.83-5.78). Paper III showed that the clinical practice was well received by women, with 36% strongly agreeing that they felt safe and 43% expressing willingness to have CMA in the event of a subsequent birth. Women who experienced fear of birth, who had a lower level of education, and who did not have Swedish as their mother tongue showed higher levels of satisfaction with CMA. Midwives with less than two years of work experience reported new learning in three out of four births (76%) and those with over 20 years of work experience reported learning in one out of five births (22%). The importance of various factors influencing learning differed for primary and second midwives and were also influenced by the level of work experience.

Our findings indicated that the CMA intervention was a well-accepted clinical practice among both midwives and women giving birth. CMA was found to provide valuable support and professional learning, which was especially pronounced among early career midwives. Experiences were complex and influenced by various factors, and the findings can be used to facilitate implementation and guide future practice.

**Key words:** Collegial midwifery assistance, midwifery, midwives' experiences, intervention, birth experience, severe perineal trauma

**Language:** English

**ISSN:** 1652-8220

**ISBN:** 978-91-8021-487-2

**Number of pages**: 116



Signature

Date 2023-10-26

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Cover art by Jörgen Lennartsson



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Faculty of Medicine

Department of Health Scienes

ISBN 978-91-8021-487-2

ISSN 1652-8220

Printed in Sweden by Media-Tryck, Lund University, Lund 2023

*”Med de andre mine Embetets Systrar skal jag hålla ett förtroligt och fridsamt umgänge, och med godt råd och willig handräckning, när sådant behöwes, gå dem wid handen;*

*Hämtas en eller flere til, på det stället jag är, skal jag uti wänlighet med dem saken öfwerlägga, och det som till den nödlidandes bästa lända kan, söka.*

*Jag skal ock, när någon mig anförtros uti konsten att undervisa, ingenting, konsten angående för henne dölja, utan hwad jag wet, troligen meddela, hos wåndande hustrur henne med mig föra, och fliteligen undervisa.”*

Jorde-Gummornes Ed, 1711.[1]

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# Preface

As the study coordinator at one of the study sites during the data collection period of the *Oneplus* trial, I often found myself faced with the same question from my colleagues: “Is it a good or bad thing to have two midwives present during childbirth?” I realised that adding a new intervention, which in this case involved summoning an additional midwife during the active second stage of labor, may not be as straightforward as it seems; there are many shades of gray between the concepts of *good* and *bad*. It made me want to scratch beneath the surface and explore the CMA intervention further, to dig deeper so I could examine the subject from various perspectives. Indeed, due to the strained conditions found at many obstetric units, this felt particularly relevant. Thus, within the context of this thesis, in the studies we undertook, I sought to illuminate the complexity of midwives’ and women’s experiences of the CMA intervention in the hope of enhancing knowledge and providing new insights that go beyond the effectiveness of the intervention in terms of reducing severe perineal trauma.

# Abstract

Severe perineal trauma (SPT) is a serious complication following vaginal birth. To reduce its incidence rate, various preventive strategies have been implemented in Swedish obstetric units. Collegial midwifery assistance (CMA), involving an additional midwife being present during the active second stage of labour, is a clinical practice that was evaluated in the *Oneplus* trial, which proved a 30% reduction in SPT. The primary aim of this thesis was to investigate midwives' and women's experiences of collegial assistance during the active second stage of labour. The secondary aim was to obtain an improved understanding of the learning embedded within this clinical practice. The four papers included in this thesis are part of the *Oneplus* trial.

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In Paper I, four key themes were constructed: (i) challenging the professional role, (ii) a balancing act between different roles, (iii) not just why and how - but who, (iv) a potential arena for learning. In Paper II, the majority of the midwives fully agreed on items related to perceived confidence and considered having a colleague present to be a positive experience (61% and 56% respectively). Midwives with less than two years of work experience were more likely to fully agree on feeling confident (aOR 9.18, 95% CI 6.28-13.41) and experiencing the presence of a colleague as positive (aOR 4.04 % CI 2.83-5.78). Paper III showed that the clinical practice was well received by women, with 36% strongly agreeing that they felt safe and 43% expressing willingness to have CMA in the event of a subsequent birth. Women who experienced fear of birth, who had a lower level of education, and who did not have Swedish as their mother tongue showed higher levels of satisfaction with CMA. Midwives with less than two years of work experience reported new learning in three out of four births (76%) and those with over 20 years of work experience reported learning in one out of five births (22%). The importance of various factors influencing learning differed for primary and second midwives and were also influenced by the level of work experience.

Our findings indicated that the CMA intervention was a well-accepted clinical practice among both midwives and women giving birth. CMA was found to provide valuable support and professional learning, which was especially pronounced among early career midwives. Experiences were complex and influenced by various factors, and the findings can be used to facilitate implementation and guide future practice.

# Populärvetenskaplig sammanfattning

Skador i ändtarmens slutmuskel, så kallade sfinkterrupturer (Grad III och IV-bristningar), är en allvarlig komplikation efter en vaginal förlossning. Under de senaste åren har stort fokus riktats mot att förebygga förlossningsskador då flertalet kvinnor har fått fysiska och psykiska besvär som påverkar deras liv negativt. För att minska dess förekomst har olika förebyggande strategier implementerats på svenska förlossningskliniker. En ny klinisk praxis, så kallat *kollegialt barnmorskestöd*, har införts på flertalet svenska förlossningskliniker i syfte att minska allvarliga förlossningsbristningar. Arbetssättet innebär att två barnmorskor tillsammans med en undersköterska närvarar under förlossningens krystskede. I jämförelse innebär traditionellt svensk standardvård att en barnmorska ansvarar för förlossningen med assistans från en undersköterska och att en extra barnmorska endast tillkallas om oro uppstår angående kvinnans eller barnets välbefinnande, om förlossningen inte fortskrider normalt, eller om en annan komplicerad situation indikerar ett behov. Effekten av kollegialt barnmorskestöd har nyligen utvärderats i en multicenter randomiserad studie (M-RCT) *Oneplus,* där fem av Sveriges förlossningskliniker deltog. Resultatet visade en minskning av sfinkterskador med 30% och de fyra artiklarna som ingår i denna avhandling är en del av multicenterstudien.

Utdrivningsskedet startar när modermunnen är fullvidgad och avslutas när barnet är framfött. Denna fas uppfattas ofta som det mest intensiva skedet för såväl kvinnan, barnet som barnmorskan. Barnmorskans vård och handläggning under detta skede innefattar inte bara kvinnans och barnets välmående utan också att ge respekt- och tillitsfull vård som bidrar till en positiv förlossningsupplevelse. Det saknas idag vetenskaplig evidens om faktorer som påverkar barnmorskors erfarenheter och uppfattningar gällande kollegial närvaro under förlossningens krystskede. Vidare saknas forskning rörande hur kvinnorna upplever kollegial närvaro samt professionellt lärande när arbetssättet utövas. Dessa är viktiga perspektiv att beakta när en ny klinisk praxis implementeras för att optimera arbetssättet och minimera eventuella oavsiktliga konsekvenser.

Det primära syftet med denna avhandling var därför att undersöka barnmorskors och kvinnors erfarenheter av kollegialt barnmorskestöd under förlossningens krystskede. Det andra syftet var att få en förbättrad förståelse för barnmorskors professionella lärande vid utövande av kollegialt barnmorskestöd.

**Studie I** är en kvalitativ studie baserad på fem fokusgruppsintervjuer med totalt 37 barnmorskor från de kliniker som deltog i *Oneplus-studien*. Syftet med studien var att utforska barnmorskornas erfarenheter av kollegialt stöd under förlossningens krystskede. Data analyserades induktivt med reflexiv tematisk analys. Barnmorskornas erfarenheter av arbetssättet var komplexa och påverkades av olika faktorer och omständigheter. Analysen resulterade i fyra nyckelteman: 1) *En utmaning av den professionella rollen*, 2) *En balansakt mellan olika roller*, 3) *Inte bara hur och varför – men vem* och 4) *En potentiell arena för lärande*. Resultatet

visade att kollegialt barnmorskestöd under förlossningens krystskede har potential att bidra med värdefullt stöd och lärande. För att undvika oönskade konsekvenser av interventionen och för att optimera förutsättningarna för kollegialt stöd så är det viktigt att ha tillräckligt med tid för planering, tydliggörande av förväntningar och möjlighet för den assisterande barnmorskan att sätta sig in i födseln.

**Studie II**, är en kvantitativ studie där data från *Oneplus-studien* användes. Syftet med studien var att undersöka hur ansvarig barnmorska upplevde att ha en kollega närvarande under förlossningens krystskede. Totalt analyserades 1430 födslar med två barnmorskor närvarande. Resultatet visade att majoriteten av de ansvariga barnmorskorna instämde helt att de kände sig trygga och positiva till att ha en extra kollega på rummet. Detta var speciellt uttalat hos de barnmorskor som var nya i yrket och arbetat mindre än två år inom förlossningsvården, jämfört med de mest erfarna med mer än 20 års erfarenhet. Resultatet visade att faktorer såsom tid på rummet (15 minuter eller mer), om barnmorskorna hade hunnit planera i förväg, och om den assisterande barnmorskan hade en aktiv roll var positivt associerat med den primära barnmorskans erfarenheter av kollegialt barnmorskestöd.

**Studie III** är en kvantitativ studie som baseras på enkäter skickade till kvinnor som erhöll kollegialt barnmorskestöd under krystskedet för att undersöka deras erfarenheter av interventionen (två barnmorskor). Utöver enkäten, användes även data från *Oneplus-studien* och materialet baserades på totalt 1050 födslar där två barnmorskor närvarat under krystskedet. Resultatet visade att kollegialt barnmorskestöd togs emot väl av kvinnorna, då 36% instämde helt i att de kände sig trygga och 43% att de önskade att få interventionen i händelse av en framtida förlossning. Kvinnor som var förlossningsrädda, hade lägre utbildningsnivå eller som inte hade svenska som modersmål visade högre tillfredsställelse med interventionen. Resultatet visade även, i likhet med barnmorskornas erfarenheter, att det sätt på vilket interventionen utfördes kunde påverka kvinnornas erfarenheter, där bland annat tid på rummet och den roll den assisterande barnmorskan intog hade betydelse.

**Studie IV** är en kvantitativ studie som baseras på samma data som på studie II. Syftet var att undersöka både den ansvariga och den assisterande barnmorskans lärande när interventionen utövades, utifrån olika erfarenhetsgrupper. Dessutom att undersöka betydelsen av faktorer såsom kollegans erfarenhet, tid för interventionen, samt om barnmorskorna återkopplat till varandra för professionellt lärande i de olika erfarenhetsgrupperna. Resultatet visade att barnmorskor med mindre än två års erfarenhet rapporterade att de lärt sig något nytt vid tre av fyra förlossningar (76%) och de med arbetslivserfarenhet över 20 år vid en av fem (22 %). Motsvarande i rollen som assisterande barnmorska för barnmorskor med erfarenhet mindre än 2 år var att de lärde sig något nytt vid tre av fem förlossningar (61%) och de mest seniora vid en av fyra förlossningar (26%). Resultatet visade även att kollegans erfarenhet, tiden interventionen varade samt om återkoppling skett påverkade barnmorskornas

lärande. Betydelsen av dessa varierade dock, dels mellan rollen som ansvarig barnmorska och assisterande barnmorska, dels mellan olika grad av erfarenhet.

Sammanfattningsvis ger avhandlingens resultat stöd för att kollegialt barnmorskestöd under förlossningens krystskede i syfte att minska allvarliga förlossningsbristningar var väl accepterat bland både barnmorskor och kvinnor. Erfarenheterna var komplexa och påverkades av flertalet faktorer. Vidare visade sig arbetssättet bidra till värdefullt kollegialt stöd och professionellt lärande, vilket var särskilt uttalat bland barnmorskor i sin tidiga karriär. Resultaten från denna avhandling kan användas för att underlätta implementering och vägleda framtida praxis.

# List of papers

*Paper I*

Tern H., Edqvist M., Ekelin M., Dahlen G H., Rubertsson C. (2023) Swedish midwives' experiences of collegial midwifery assistance during the second stage of labour: A qualitative study. *Women and Birth*, *36* (11), 72-79. doi.org/10.1016/j.wombi.2022.03.003.

*Paper II*

Tern H., Edqvist M., Ekelin M., Dahlen G H., Rubertsson C. (2023) Primary midwives' experiences of collegial midwifery assistance during the active second stage of labour: Data from the Oneplus Trial. *Birth.* doi: 10.1111/birt.12739.

*Paper III*

Tern H., Rubertsson C., Ekelin M., Dahlen G H., Häggsgård C., Edqvist M. Women's experiences of being attended by two midwives during the active second stage of labour: Secondary outcomes from the Oneplus trial. Submitted.

*Paper IV*

Tern H., Rubertsson C., Edqvist M., Ekelin M. Midwives' experiences of professional learning when practicing collegial midwifery assistance during the active second stage of labour: Data from the Oneplus trial. In manuscript.

# Additional work

Häggsgård, C., Edqvist, M., Teleman, P., **Tern, H**., Rubertsson, C. Impact of collegial midwifery assistance during the second stage of labour on women's experience: A follow-up study from the Oneplus randomised controlled trial. Submitted.

Edqvist, M., Dahlen, H. G., Häggsgård, C., **Tern, H**., Ängeby, K., Teleman, P., Ajne, G., Rubertsson, C. (2022). The effect of two midwives during the second stage of labour to reduce severe perineal trauma (Oneplus): a multicentre, randomised controlled trial in Sweden. *Lancet,* 399 (10331), 1242-1253.

Edqvist, M., Dahlen, H. G., Häggsgård, C., **Tern, H**., Ängeby, K., Tegerstedt, G., Teleman, P., Ajne, G., Rubertsson, C. (2020). One Plus One Equals Two—will that do? A trial protocol for a Swedish multicentre randomised controlled trial to evaluate a clinical practice to reduce severe perineal trauma. *Trials,* 21(1), 945.

# Abbreviations

| | |
|---|---|
| aOR | Adjusted odds ratio |
| CI | Confidence interval |
| CMA | Collegial midwifery assistance |
| CPD | Continuing Professional Development |
| CR | Critical realism |
| CRF | Clinical report form |
| CTG | Cardiotocography |
| FG | Focus group |
| FOB | Fear of birth |
| M-RCT | Multicentre randomised controlled trial |
| OR | Odds ratio |
| SCT | Social Cognitive Theory |
| SPSS | Statistical Package for the Social Sciences |
| SPT | Severe perineal trauma |
| TA | Thematic analysis |
| VBAC | Vaginal birth after caesarean section |
| WHO | World Health Organisation |

# 1. Introduction

## Setting the scene

In recent years, there has been an increased focus on methods aimed at reducing severe perineal trauma (SPT) during childbirth, driven by an enhanced awareness of its associated morbidity for women.[2] Consequently, various preventive strategies have been implemented in Sweden.[3,4] The motivation for this thesis was that, despite a lack of evidence regarding effectiveness, approximately half of the Swedish obstetric units have implemented a clinical practice referred to as *collegial midwifery assistance* (CMA).[5] In this practice, a second midwife is present during the active second stage of labour with the aim of preventing SPT.[5] This led to the initiation of a multi-center randomised controlled study - the *Oneplus* trial – designed to evaluate the effect of CMA. The trial revealed a 30% reduction of SPT among women who gave birth spontaneously for the first time.[6] Since it was hypothesised that the presence of a second midwife during the active second stage of labour might influence both midwives and women, the trial was designed to study their experiences of CMA.[5] Accordingly, all four papers included in this thesis are sub-studies of the *Oneplus* trial, and evaluate the concept of CMA from different perspectives.[5,6]

## Summary of the thesis background and rationale

The second stage of labour is often considered to be the most critical and intense phase of childbirth, and can be experienced as stressful for the midwife, the woman giving birth, and the child.[7] Midwifery care given during this decisive and critical period involves not only ensuring the wellbeing of the mother and child, but it also involves building relationships[8] and providing respectful care that will result in a positive childbirth experience.[9] In Swedish standard care, one midwife takes responsibility for the birth, with assistance from an assistant nurse. A second midwife is traditionally only summoned in cases when the primary midwife requests additional assistance due to concerns regarding the wellbeing of the woman or child. This additional support is typically requested in cases of prolonged labour or when the birth is deemed to have potential complications.

Swedish intrapartum care is currently strained due to a shortage of midwives and high workloads.[10] The shortage is in part explained by retirements, but in addition to this, many midwives are leaving the profession,[11] especially in the early stages of their careers.[12,13] This underscores the importance of reducing turnover and retaining midwives in intrapartum care,[13] where a focus on job satisfaction and professional pride is crucial.[14] In addition, burnout rates among midwives are high due to a stressful work environment and high demands being placed on staff.[15,16] Furthermore, research indicates that certain midwifery skills require more practice than is typically provided in educational programmes.[17,18] Early career midwives, in particular, require support for advancement in their profession, especially during the first year of their career.[19,20] This has resulted in a substantial number of junior midwives experiencing the transition into midwifery as a demanding period that require the swift acquisition of skills for efficient job performance.[21]

Collaboration between midwives during the second stage of labour is an unexplored area in research. However, previous studies have demonstrated that effective collaboration between maternity care providers is vital for achieving high quality and safe healthcare, even though barriers can be encountered.[22,23] It is important to evaluate CMA from the perspectives of midwives' in order to optimise clinical practice based on their insights, not only for improved job-satisfaction and professional growth, but also for identifying and preventing unintended side effects that could affect both midwives, and ultimately, the women in their care.

Moreover, it is essential to evaluate all interventions that are introduced during labour and birth from the women's perspective.[9] The act of giving birth is a significant event in a woman's life, where a positive experience can contribute towards long-term improvements in self-confidence and self-esteem. Conversely, a negative experience can have an adverse impact on psychological health[24] and have implications for future birth planning.[25]

Considering that CMA is a complex intervention that involves an additional midwife during the sensitive second stage of labour, it may influence the experiences of both midwives and the women giving birth. Given the lack of evidence regarding their experiences, my aim is to evaluate CMA from their perspectives in the studies undertaken within the framework of this thesis. In doing so, I hope to provide a more holistic picture and an improved understanding of CMA.

## The outline of the thesis

This introduction has provided information on the point of departure for the thesis. The subsequent chapters are organised as follows: Chapter 2 provides an overview of the research area, including Swedish intrapartum care and historical context, key concepts, and definitions. In Chapter 3, the rationale of the thesis is explained, while

Chapter 4 outlines the overarching aim and the specific sub-aims addressed in the papers. Chapter 5 presents a description of the theoretical frameworks used to frame and synthesise CMA in this thesis, while Chapter 6 provides theoretical information on ontology and epistemology and the rationale behind them. It also gives an overview and descriptions of materials and methods used in each of the four papers. In Chapter 7, the key findings are summarised and synthesised using the specified framework. Chapter 8 provides methodological considerations, and a general discussion and interpretation of the findings. This is followed by an overall conclusion in Chapter 9, clinical implications in Chapter 10, and future perspectives in Chapter 11. Finally, Chapter 12 acknowledges contributors and Chapter 13 lists references.

# 2. Background

## The Swedish birth care context

### Key figures and trends

Sweden holds one of Europe's highest birth rates,[26] with approximately 115,000 births annually, of which around 40 percent are first-time mothers.[27] Currently, the mean age of women giving birth for the first time is approximately 30 years.[27] Sweden is recognised as one of the safest countries in the world to give birth in, maintaining high-quality care with low rates of serious adverse events for both mothers and babies on an international scale.[28] As of 2021, Sweden ranks among the countries with the lowest maternal mortality ratios, with five deaths per 100,000 live births, and a neonatal mortality rate of 1.4 per 100,000 live births.[29] Efforts to further improve Swedish intrapartum care with the aim of achieving even more favourable outcomes include active engagement in the form of interdisciplinary projects with collaboration between the Swedish Association of Midwives, the Swedish Association of Obstetrics and Gynaecology, and the Swedish Paediatric Society's neonatal association. These initiatives receive support from the County Councils' mutual insurance company (Löf).[30] Despite all these positive indicators, there is a variation across birth units in terms of maternal and neonatal outcomes. This can in part be explained by differences in populations, organisational structures, and variations in practices and procedures in different settings.[31] Overall, Swedish birth care is characterised by ongoing transformations. The care burden has increased as a consequence of various factors, including rising maternal age and more risk factors in the birthing population, which in turn lead to an increased risk for complications.[28]

In recent years, there has been a decline in the number of spontaneous onsets of labour, currently accounting for around 65% of all births. Concurrently, there has been an increase in inductions with a national average approaching one third of all births. Currently, approximately 85% of primiparous women give birth spontaneously vaginally, while around 10% undergo instrumental births, primarily by vacuum extraction. The proportion of women who have their first vaginal birth after a caesarean section (VBAC) hovers at approximately 40%.[31] Although Sweden has one of the lowest caesarean section rates in the world,[32] with a national average of 19%, an increasing trend has been observed.[31]

## Swedish maternity care

Swedish maternity care is provided free of charge for all citizens and is financed by the government through tax payments, with the exception of home births.[33] Most women give birth in hospitals with Sweden currently having 42 public birth units.[34] The traditional model of care in Sweden involves pregnant women being enrolled in maternal health care, where they meet the same midwife for approximately eight appointments.[28] Maternal health care is provided independently of maternity care and is organised by the women's clinic, primary care or privately. Thus, a woman is usually assisted by different midwives during labour and birth, as the birth units are staffed by different midwives than those in maternal health care. Alternative models of care, such as continuity of care, also called *Case load midwifery*, where a primary midwife cares for the woman throughout the antenatal, intrapartum, and postpartum periods, have so far mostly been carried out in project form.[28] Despite all women having access to high-quality maternal care, the alternatives for giving birth outside public hospitals are limited. At present, Sweden has no midwifery-led birth units, and home births provided by independent midwives are rare.[33,35,36]

## Competence and skill development of midwives

Sweden has a longstanding tradition of regulating the professional competence and role of midwives, dating back to the church with the first regulations being recorded in 1688.[33] In 1711, the initial regulations for midwives' professional competence were implemented, stipulating a two-year training programme followed by an examination at the *Collegium Medicum*. The first Swedish midwifery training school was founded by the obstetrician Johan von Hoorn in 1708, where his textbooks *'The Swedish Well-trained Midwife' (1696)* and '*The Two God-fearing Midwives Siphra and Pua, true to their vocation and therefore well rewarded by God*' (1715) served as the foundation for the midwifery education. In 1757, a national education programme encompassing all parishes was established.[37]

Currently, Sweden has no direct-entry programme for students aspiring to become licensed midwives. The foundation for midwifery education is a bachelor's degree in nursing with 90 higher education credits at advanced level.[38] The midwifery programme combines theoretical education with clinical training across different areas and settings, including maternity care clinics and birth units. To become certified, every midwifery student is required to provide care to 100 women during labour and assist 50 births independently.[39] However, many midwives find the transition from student to independent midwife challenging. The work requires the swift adoption of tasks and skills for efficient job performance,[21] where more practice than the current education programme provides is needed.[17,18] Hence, newly graduated midwives often seek mentoring and support in the early stages of their careers in order to be able to advance professionally.[20] Collegial support such as experiential learning on-the-job with experienced colleagues observing and

providing feedback, has been shown to aid early career midwives in building confidence in their new role.[40] However, this kind of support can be hard to achieve in busy and strained birth units.[41] Another challenge is that many positions require midwives to rotate between different wards, leading to attendance at fewer births. The consequence of these factors is that it is more difficult to acquire and maintain competence in intrapartum care, particularly for newly graduated midwives.[17]

Continuing professional development (CPD) based on scientific evidence is an essential requirement for all midwives regardless of their work experience.[40,42] One concern that has been raised is the disproportionate emphasis on educational efforts for junior midwives, which has led to the continuing education of late-career midwives becoming deprioritised.[43] At the same time, advancements in intrapartum care are occurring at a rapid pace, accompanied by substantial expectations being placed on senior midwives.[28] Considering that learning needs differ based on work experience, collegial collaboration during childbirth has been identified as beneficial for professional development.[17,44,45]

## The role of the Swedish midwife

Swedish midwives work independently within a life-cycle perspective, providing care to women throughout normal pregnancy, childbirth, and postnatal care autonomously. Their occupational scope is extensive and their work targets women of all ages, including adolescents, young adults, and older women.[42] Midwives provide over 80% of sexual and reproductive services, including tasks such as prescribing contraceptives, inserting intrauterine devices and implants, and providing counselling and the administration of medication to women who have chosen abortion.[46]

During childbirth, a primary midwife independently manages normal labour and childbirth in collaboration with a nurse assistant. In complicated cases involving labour or birth, the primary midwife collaborates with colleagues and other professionals.[42] Team collaboration is standard practice across all birth units although the composition of healthcare professionals may differ between them. Each unit typically has a midwife, nurse assistant, and an obstetrician as part of a team. Major obstetric units have a senior midwife in charge who has the overall responsibility of overseeing the organisation and coordinating care, working to ensure a safe and efficient care environment. Responsibilities of this role may include managing staff, coordinating resources, communicating with other caregivers, and making decisions to meet the needs of the women and their families.[28] This position also includes supporting and assisting colleagues during labour and birth through counselling and conducting clinical evaluations when required.

### Attrition challenges

Despite Swedish maternity care maintaining a high level in terms of the medical outcomes for women and children,[28] it faces some major challenges. Similar to the rest of the world,[47] Sweden has a shortage of midwives, especially in intrapartum care, and it has previously been predicted that primarily due to retirements, this trend will persist until 2035.[11] Precise figures regarding the number of midwives who work within intrapartum care are, however, difficult to obtain, since many rotate between different departments, work part time, or are on maternal leave.[28] A recent report found that, in principle, Sweden has access to an adequate number of midwives, but the real dilemma is that one in four midwives working in intrapartum care has chosen to leave the profession.[34] This has been attributed to high workloads and strained working environments,[10] and, similarly to other countries, early career midwives often deciding to leave their positions.[12,13,16,] Further, research shows that symptoms of depression, anxiety, stress,[16] and burnout[15,16] are common among Swedish midwives. For these reasons, increased attention has been directed towards exploring the working conditions and the professional role of midwives within intrapartum care in recent years.[10]

## Workplace adversity

### Professional challenges

Emotional work is intrinsically embedded in the midwifery profession. Midwives work with women during some of the most profoundly emotional periods of their lives and have to manage the complexities of birth and death, physical and emotional pain, joy, and sadness.[48] The context of their practice highly influences this emotional work. This involves the work and effort midwives put into managing and regulating their own emotions as well as expressing and managing emotions in social interactions and relationships.[49] Midwifery can also include becoming a *second victim*, for example in extreme events a mother or baby can be injured or even die, which can trigger emotions of blame, shame, and guilt among midwives.[50]

Professional challenges within midwifery manifest at both micro and macro levels. At the macro level, bureaucratic rules within organisations can be perceived as hindrances to occupational autonomy and flexibility, disempowering and controlling midwives' practice. Professional challenges at the micro level may arise when midwives feel constrained in their clinical decisions when their practice is restricted by protocols and guidelines.[51] Many midwives are dissatisfied with how midwifery care is organised and with their own role as a midwife, in particular when there is a misalignment between a midwife's own professional ideals and reality, resulting in a perceived decrease in the quality of care provided.[52]

## Cultural norms and ideologies

Cultural norms and values within birth units play a role in guiding practices and procedures, influencing how maternal care workers approach childbirth.[53] The anthropologist Davis-Floyd stated that childbirth is situated on the border between biological and cultural processes and thereby the individual's way of managing it reveals our core cultural values. This can be understood as an appointed meeting hub where the natural and the medicalised perspectives meet.[54] Considering that evidence-based midwifery practice does not occur in isolation, the individual perspectives and values of the birth care provider will also influence the childbirth process.[33]

The effectiveness of teamwork is intricately tied to workplace culture, workload, level of competence, and the working methods.[28] Therefore, conflicting ideologies among professionals within intrapartum care can impede work,[55] creating a field of tension for midwives.[56] Although the relationship between midwives and obstetricians has predominantly been characterised by collaboration,[57] a lack of consensus on care ideologies and practices has been shown to be a potential source of conflicts and poor collaboration.[22] Thus, although they share the common goal of providing safe and high-quality care, obstetricians and midwives having differing views can result in a less effective collaboration.[22,23] The *medical model* of childbirth focuses on risk reduction, and a birth can only be considered normal in retrospect. This model consequently emphasises an active approach where interventions are an inherent component. In contrast, the *social model* sees the woman as the active participant, and care is focused on normality and giving support to the woman.[58] For midwives, these differences in views and values between colleagues could mean that they are forced to work according to an ideology, *with institution* or *with woman*, that conflicts with their own ideology. Divergent values have also been identified between junior and senior midwives, which can lead to emotional challenges and tensions.[55]

## Autonomy

Maintaining a sense of pride and fulfilment is essential for midwives to stay in the profession.[14] High levels of work autonomy further contribute to work-related wellbeing and job satisfaction among midwives.[59] Despite this, there is still a lack of consensus regarding the definition of *autonomy* in midwifery, with various definitions existing.[60] A central element, according to the literature, is the degree of control of both immediate real time task scheduling and organisational decision-making.[61] Changes in maternity systems could challenge the perceived level of autonomy for professionals in the field.[59]

Activities outside the birthing room can make midwives feel controlled by colleagues and physicians. One example can be when discussions concerning the

care of a woman occur in the office, which is described as the labour units *nerve centre*. The responsible midwife is aware of the transparency followed by CTG-monitoring (cardiotocography) where the baby's heart pattern along with the woman's contractions are displayed and discussed outside the room without those taking part in the discussion having the whole picture. The feeling of being controlled can also arise when senior midwives or physicians interfere by knocking on the door to the birthing room.[56] This type of surveillance, metaphorically referred to as *the all-seeing eye* based on Foucault's description of *Panopticon*, illustrates how power and control can be exercised in institutional structures like hospitals, creating an atmosphere of uncertainty. The constant threat of surveillance can lead individuals to internalise norms and behave according to expectations even without direct pressure or actual surveillance.[62,63]

Autonomy in healthcare settings, although understood as freedom of choice, can be hard to achieve due to the complexity of processes often involving several people concurrently. Autonomy is also connected to philosophical and moral issues as it is an essential legal requirement for working in health care.[64] Although autonomy can often be perceived as independence and being free from the control or power of others, it comes with the responsibility of meeting specific demands that are embedded in professional regulations, including midwifery regulations, rendering it complex. This poses specific requirements on having sufficient knowledge and capacity for decision-making and critical thinking skills. In midwifery, this also includes being confident enough to make decisions in collaboration with the woman giving birth.[60] Constrained work autonomy and capacity for making decisions have also been reported by midwives when specific methods to reduce SPT (perineal care bundles) have been introduced, as midwives then have to adhere to a prescribed way of working.[65]

## Resilience

Midwives' ability to cope with workplace adversity in terms of resilience has been regarded as important although, due to complexity, there is a lack of consensus regarding the definition.[51] Despite this, resilience can be described as a "*dynamic process encompassing positive adaptation within the context of significant adversity"* (p. 543).[66] An individual's personality is of significance to resilience, including traits such as ego-resilience i.e. the individual's capacity to adapt to perpetually shifting demands, positive self-concepts, hardiness and social support, and network.[67] Aaron Antonowsky's concept of *sense of coherence* (SOC) emphasises a person's ability to understand, manage, and find meaning in life experiences. SOC includes the key components *comprehensibility, manageability,* and *meaningfulness.* A strong SOC can act as a protective factor against stress, facilitating people's ability to cope with stress, resist illness and maintain good health.[68] Positive workplace emotions are further crucial for a thriving prosocial behaviour and favourable job attitudes that improve the work environment and task

performance.[69] An important resilient response to workplace challenges within midwifery is the development of *self-efficacy*,[51] which according to Albert Bandura is defined as: "*people's judgements of their capabilities to execute courses of action that are required to attain designated types of performances*" (p.53).[70]

In midwifery, the sense of belonging to a professional family strengthens both personal and professional identity, both of which are important for building resilience.[51] This sense of familiarity, where the influence of colleagues is important, has been shown to improve workplace confidence. Correspondingly, the opposite has been shown to have a negative effect.[71] Confidence has been defined as: *"the feeling that you can trust, believe in and be sure about the abilities or good qualities of somebody/something"*[72] and organisations should actively strive to enhance midwives' confidence.[71] There are pivotal *critical moments* in a midwife's career where the individual is especially vulnerable to workplace adversity, and access to collegial support has been shown to be advantageous for building and maintain resilience during these periods. This support is especially crucial for early career midwives, offering focused support from colleagues with greater expertise.[51]

# Midwifery care from the perspective of women

## The childbirth experience

Giving birth is a life changing, multifaceted experience in a woman's life and has powerful long-lasting effects.[24,73] The World Health Organization (WHO) emphasises women's right to a positive childbirth experience, recognising it as more than just the survival of mothers and babies. All interventions introduced during labour and birth, therefore, need to be evaluated from the women's perspective.[9] Positive birth experiences can bring psychological benefits, while negative experiences can result in long-term reductions in mental wellbeing.[24] Moreover, negative experiences can influence future birth planning and result in increased rates of caesarean sections.[25] They are also associated with post-traumatic stress disorder (PTSD),[74] postpartum depression,[75] poor mother-child bonding and impeded breastfeeding.[76] First-time mothers are more susceptible to negative birth experiences, with approximately 10% remaining dissatisfied with their birth experience one year later.[77]

The individual childbirth experience is inherently subjective and is unique for every woman. Hence, the ultimate judgement on whether it was a positive or negative experience rests solely upon the woman herself.[78] Childbirth experiences are complex, multidimensional, and influenced by both physical and psychosocial factors.[79] Although adverse birth outcomes for mothers and infants, such as suffering from severe perineal trauma (SPT) or the transfer of the newborn to a

neonatal care unit, have been demonstrated to have an impact,[80,81] childbirth outcomes are not necessarily predictive of the overall childbirth experience. Regardless of complications and negative outcomes, positive experiences can still be possible, and vice versa.[82] Evidence suggests that the behaviour and attitudes of maternity care providers, and the woman's feelings of confidence and safety, are key determinants in shaping the quality of her childbirth experience.[83]

A recent, inclusive, woman-centred definition of what constitutes a positive childbirth experience has been introduced, highlighting provider interactions that make the woman feel supported, in control, safe, and respected.[82] The quality of care from birth care providers is of vital importance for a woman's subjective birth experience, which includes providing emotional support, effective communication, involving the woman in decision-making, showing respect, and safeguarding privacy.[84] While there is consensus that care during childbirth should be women-centred, a universally accepted definition is yet to be established.[85] A recent review has evaluated the concept and shown that it entails elements such as protecting normal birth, safeguarding the woman's choices and control, as well as empowering her by involving her in shared decision making. Furthermore, the individual midwives' personal attributes were strongly linked to relationships and partnership with the woman and the provision of women-centred care.[85]

Women's experiences of childbirth are not only impacted by the quality of care but also by cultural, emotional, and psychological factors.[86] Antecedent conditions and sociodemographic characteristics such as low educational attainment,[87] fear of birth (FOB),[88] and being foreign born[89] are examples of personal background factors that have been identified as influencers of birth experience. Moreover, it has been shown that women tend to value the care they receive due to lack of alternatives to compare with, which further illustrates the multifaceted nature of birth experiences.[90] However, given that midwifery by its very nature should be women-centred, it is crucial that birth experiences are understood from the perspective of the woman herself.[91]

## Birth environment

As early as 1856, the importance of creating a *safe haven* for the birthing woman was recognised by Cedersköld in a textbook for midwives. He stated that the woman should be comforted and relieved from anxiety and noise. He also stated that she should be allowed to have her husband or other trusted individuals with her for comfort. Other than this, only the necessary assistance should be present in the birthing room and, above all, it should be free from anyone the woman felt uncomfortable with.[92] Giving birth is, in addition to a physiological process, also a psychosocial process, involving not only the woman and child, but also her partner and family. Since profound events that concern life and death can evoke existential

questions, the woman is particularly vulnerable during childbirth. Vulnerability around childbirth also involves the transition from pregnancy to motherhood.[93]

Childbirth can be understood as a rite of passage consisting of three phases. It starts with separation, where the woman endeavours to disengage from the external realm and seeks to diminish both external and internal distractions. The liminal phase is characterised by the woman entering her *own world* and experiencing an altered state of consciousness. This is followed by the woman's reintegration into the outside world after the child is born. The birth experience is then incorporated into the woman's sense of self.[91]

The midwife's role is indispensable in promoting a physiologically and emotionally safe environment for women during childbirth, and fostering an open-minded atmosphere.[94] The midwife thereby seeks to preserve the *birth-bubble* by ensuring a calm and protecting environment and safeguarding the woman from any disturbances or distractions, either from outside or from within the delivery room itself.[95] This is congruent with the core tenets of the *Birth Territory* theory, which posits that midwives use a *midwifery guardianship* to establish and sustain the optimal birth territory in order to promote a physiological birth where the woman is satisfied and can adjust effortlessly to the post-birth period.[96] Moreover, a birth environment that is perceived as safe reduces stress and supports the release of endogenous oxytocin. Even subtle stress provoked by, to the woman, unfamiliar surroundings or people can reduce the levels of endogenous oxytocin, which has a crucial role in controlling the neuroendocrine, psychological, and physiological aspects of labour and birth, minimising pain, stress, and fear, and fostering the transition to motherhood.[97]

# Prevention of SPT during the second stage of labour

## The second stage of labour

The second stage of labour follows the first stage (divided into *latent* and *active phases*) and consists of two different phases: the *passive* and the *active second stage of labour.* It commences when the cervix is fully dilated and ends with the birth of the baby. The *passive* second stage starts with full dilatation of the cervix with the presenting part passively rotating and descending down the birth canal. The *active* second stage is characterised by the presenting part becoming visible and the woman starting to bear down.[98] The second stage is followed by the *third stage,* in which the birth of the placenta takes place. There is currently no consensus regarding an acceptable length of the second stage of labour and international debates are ongoing.[99]

The second stage of labour is widely recognised as the most intense and pivotal phase in childbirth for the woman, the baby,[99] and the midwife.[7] Trustful relationships are particularly important during this stage, and establishing new connections with others can be difficult.[8] The intention of midwifery care is to provide respectful support and to ensure that the woman feels safe and supported, thereby reducing stress and anxiety. For these reasons, all interventions carried out during the intense second stage of labour should be carefully considered, as they have the potential to interrupt the physiologic process of labour.[7]

Since both the unborn baby and the woman are exposed to significant stress during the active second stage of labour, great demands are placed on the midwife to interpret the CTG trace correctly in order to avoid unnecessary interventions. The occurrence of pathophysiological changes can rapidly lead to fetal compromise, which requires swift decisions to be made and measures to be taken to reduce morbidity and mortality.[100] Practice decisions have been shown to be particularly challenging during the second stage of labour as it is complex and influenced by the environment and the people in the birthing room. This is particularly true when maternity care providers have conflicting opinions and a lack of high-level evidence regarding optimal practices add to the complexity.[7] Effective midwifery decision-making is a crucial component during this period, since it has a direct impact on both the quality of care and the safety of the woman and baby.[101]

Midwifery care during the second stage of labour involves several components. One is to consistently provide the woman and her birth companion with accurate and truthful information to ensure her autonomy to make informed choices. Observing, communicating, and providing support are all essential aspects. Considering the potential need for analgesia, ensuring adequate progress, and encouraging the woman to adopt pushing positions that are comfortable and physiologically advantageous are also important parts of midwifery care. Additionally, since this phase poses the highest risk of SPT occurring, another crucial aspect of midwifery care practice during the active second stage of labour is to preserve the perineum.[99]

## Severe perineal trauma

Severe perineal trauma (SPT) is a serious complication of vaginal birth and is a global health concern for women.[102] SPT involving the perineum and the anal sphincter complex is defined as a third-degree tear, and/or when the anorectal mucosa is involved, it is defined as a fourth-degree tear.[103] SPT can have major consequences for women, and can lead to both short- and long-term morbidity.[102] These include physical complications, with incontinence being one of the most common, as well as adverse psychological effects such as decreased mental wellbeing, social isolation, and negative impacts on sexual health.[104] Women undergoing their first vaginal birth are at particular risk of SPT.[105,106] Other important risk factors are instrumental births, high birth weight,[106] occiput posterior

position,[107] vaginal birth after caesarean section (VBAC),[108,109] Asian ethnicity,[110,106] infibulation,[111] and maternal age.[106] The incidence of SPT has risen in recent decades in many high-income countries, including Sweden. Figures from the Swedish medical birth register showed an increasing trend between 1990 and 2004. This increase could partly be explained by improved diagnostics, but also by less focus being placed on preventive methods than previously. Figures have thereafter decreased.[112] Data from 2021 showed a national mean rate of 3.7% among nulliparous women, with significant variations across obstetric units, ranging from 1.1% to 6.8%.[31]

## Preventive practices - then and now

The application of preventive practices to reduce SPT is no novel concept and historical data reveals its longstanding history. A Greek physician named Soranus, who lived 2000 years ago, wrote the first known textbook for midwives.[113] In it he described how the midwife should protect the perineum with her hands and a warm linen cloth. Perineal protection has continued to be described throughout history[113] with Carl David Josephsson in the 19th century illustrating how the perineum was to be protected against ruptures through childbirth positions and hand grips.[114] The following regarding perineal protection is written in the book:

*"It is not difficult to prevent at least one major perineal rupture, if you just proceed methodically with a clear awareness of what you can expect from your actions."* (p. 30).

In his book, he describes three factors that must be considered, all of which still have much in common with the approaches of today. Factor 1 describes the importance of a constant overview of the perineum from the moment the head cuts in, factor 2 describes that the head must not pass too quickly and preferably not during pain, and factor 3 describes that it should pass with the smallest possible circumference through the vulva and with the largest diameter of the passage plane in the middle width, i.e. in a rotated manner.

There has been a societal shift towards increased dissatisfaction post birth in recent years among women in Sweden, which suggests that maternity care needs to be modernised. There is now less tolerance for decreased quality of life due to birth injuries, something that would previously have been accepted as *normal*.[113,115] Hence, there is now an increased focus on education both in the midwifery programme and in obstetric units.[113] National guidelines and web-based courses have been further developed with the aim of increasing the quality of care within this area.[116,117]

The implementation of multifactorial preventive intervention programmes in Swedish birth units aim to reduce the incidence rate of SPT. Examples include the MIMA prevention model and the modified Finnish model, which both aim to reduce

the pace of the birth of the infant thereby allowing tissues to stretch and adapt.[3,4] However, which techniques should be used to slow down the birth process continues to be debated and the selection of methodology must not come at the expense of women's preferences and desires.[118,119,120] One major concern is the dearth of high-level evidence regarding effective preventive strategies to reduce SPT.[121] Until now, only warm compresses and perineum massage have been evaluated in randomised controlled trials, both of which have been proven to be effective.[2]

*Collegial midwifery assistance* (CMA) is a clinical practice that was implemented in approximately 50% of Swedish birth units without any evidence of its effectiveness before the *Oneplus* trial was conducted.[5] The study showed that if a second midwife is present during the active phase of the second stage of labour, there was a 30% reduction of the incident rate of SPT. The results further showed that there were no discernible variances between the standard care group and the intervention group (one midwife being present compared to two midwives) in terms of protective techniques, such as various hand manoeuvres or warm compresses held at the perineum, or birth positions. Maternal and neonatal outcomes were also equal in both groups. The only observed difference was the duration of active pushing, which was slightly longer when two midwives were present compared to standard care with one midwife. The authors concluded that the intervention is complex and that various interacting components could have contributed to a preventive behaviour change, such as communication with the birthing woman and feedback between the midwives.[6]

# Collegial midwifery assistance

## Definition – collegial midwifery assistance

In this thesis *Collegial midwifery assistance* (CMA), also known as *Collegial assistance*, refers to a clinical practice that is used to reduce the incident rate of SPT.[6] In contrast to Swedish standard care, where one primary midwife cooperates with an assistant nurse, collegial midwifery assistance involves a second midwife who is present in the birthing room during the last phase of the second stage of labour with the aim of reducing the incident rate of SPT.

The concept of *midwifery* in this thesis specifically refers to registered midwives who practice CMA. Thus, it does not encompass other professionals who are involved in intrapartum care such as assistant nurses or obstetricians.

The concept *collegial* is described in the Cambridge dictionary as follows: *"Collegial, relating to a friendly relationship between colleagues (people who work*

*together) and used to describe a method of working in which responsibility is shared between several people."*[122]

In the context of practicing CMA, the word *assistance* implies that the second midwife is ready to assist the primary midwife and to support the birthing woman as required.[5,6]

## A second midwife

In the context of Swedish standard care, a primary midwife assists the birthing woman in collaboration with a nurse assistant. An additional midwife is only summoned if concerns regarding the labour arise or in other cases where a second opinion or additional support is needed. This kind of collegial support is not a new phenomenon. Throughout history, midwives have been required to be conscientious and seek the assistance of a colleague in cases where issues arise during labour and birth. As early as the 18th century, Johan Von Hoorn described the procedure of involving a colleague that was meticulously guided:

*"The, to the birth, first attending [midwife] should take the consulted [midwife] aside and 'kindly' inform her about her opinion on the case. Thereafter, the consulted should approach the woman and make detailed inquiries about her condition. After this there should be a mutual deliberation about what would be the best way to act. When they had agreed, the first attending midwife, who was expected to be the younger of the two, should manage the birth, and the consulted, who was assumed to be the older, should assist with advice and practical support, so that 'then the older or last attending will have the honour, and the younger the effort and the work'. Only in cases when the younger has not previously managed a similarly difficult birth, as the one where she is consulting, or if the woman and the otherwise present have requested it, should the older midwife manage the birth and not reject to do so*" (p. 62).[123]

This text, based on experience, not only describes the approach and how the midwives should behave in front of the woman, but also clearly describes how the tasks and responsibilities should be shared and distributed between the midwives. In today's maternity care, it is often a senior or experienced midwife, or a senior midwife in charge, who provides support to a colleague and intervenes to help resolve arising situations.[28] However, this differs slightly from CMA, where the purpose of the second midwife's presence is specifically aimed at reducing SPT.[5] Similarly, while having two midwives present during labour and birth is common practice in other countries, the primary purpose is typically to assist with the birth and provide support in emergencies, not necessarily to prevent SPT.[6]

# 3. Rationale

The results from the *Oneplus* trial provided evidence that CMA reduces the risk of SPT in women giving birth spontaneously for the first time. This is a significant finding as SPT is a serious complication following childbirth. It underscores the necessity of adhering to evidence-based approaches as SPT can have a major impact on women's psychological and physiological wellbeing post childbirth. Since the CMA intervention involves two midwives being present during the active second stage of labour, in contrast to the standard Swedish care involving only one midwife, it may impact the experiences of both the midwives and the women giving birth. Due to the complexity of the CMA intervention and the fact that it is carried out during the most intensive phase during childbirth for the woman, the unborn child, and the midwife, it is important that their experiences are explored. The current lack of scientific evidence regarding both midwives' and women's experiences of CMA warrants the evaluation of their perspectives, not only to assess the effectiveness of the intervention but also to obtain a more holistic understanding of it. Swedish maternity care is facing major challenges in terms of competence provision. It is therefore also of interest to obtain knowledge of factors influencing the midwives' experiences. The results can be used to identify the potential advantages and disadvantages of CMA as well as guide its implementation. And furthermore, once implemented, the results can be used to optimise and refine the practice for the mutual benefit of midwives and women.

# 4. Aims

## Overall aim

The primary aim of this thesis was to investigate the experiences of both midwives and women involved in collegial midwifery assistance (CMA) with the purpose of preventing severe perineal trauma during the active second stage of labour. The secondary aim was to obtain an improved understanding of professional learning embedded within this clinical practice.

## Specific aims

- **Paper I:** To explore midwives' experiences of collegial midwifery assistance during the second stage of labour.
- **Paper II:** To investigate primary midwives' experiences of collegial midwifery assistance with the purpose of preventing SPT during the active second stage of labour.
- **Paper III:** To investigate women's experiences of being assisted by two midwives with the purpose of preventing SPT during the active second stage of labour, and to further explore possible factors influencing the women's experiences of CMA.
- **Paper IV:** To investigate learning experiences of primary and second midwives with varying levels of work experience when practicing CMA, and to further explore possible factors that influence their learning.

# 5. Theoretical Framework

In this thesis, two distinct theoretical frameworks were employed. The first, *Social Cognitive Theory* (SCT) developed by Albert Bandura,[124] was utilised to synthesise and integrate the findings presented in the four papers included in the thesis in the results section. SCT was used as it addresses and enhances understanding of how different environmental, personal, and cognitive factors impact people's behaviour and learning.[125] The second framework that underpins the methodology of this thesis was *Critical realism* (CR), as described by Ray Bahskar.[126] This framework was employed as it has been deemed appropriate for midwifery research and enables researchers to study a complex phenomenon that is influenced by numerous factors.[127] The findings are interpreted in the discussion section according to these theoretical frameworks to gain a more nuanced and comprehensive understanding of the experiences associated with CMA. In the following section, key concepts of SCT theory that are considered relevant in the context of this thesis are described. This is followed by a brief summary of the key aspects of CR.

## Social Cognitive Theory

Albert Bandura has developed multiple theoretical and empirical works that as a whole make up an overarching theoretical framework known as *Social Cognitive Theory.*[124] This theory has been defined as: *"a comprehensive framework for understanding persons and their capacity for agency"*[70] (p.xii). A few core features characterise human agency where consciousness is central in processing information for selecting, constructing, evaluating and regulating courses of action.[128] Hence, humans are mindful agents with a capacity for reflective and deliberate conscious activity.[70]

### Core features of human agency

There are four core features that play pivotal roles in the realm of human agency. *Intentionality* refers to purposeful actions taken by an individual to attain an outcome. It implies that individuals have conscious intentions, which serve as motivators for their forthcoming actions. *Forethought* is the individual's capacity to anticipate the outcomes of an action. *Self-Reactiveness* implies that individuals

evaluate their own performance according to established behavioural standards in various situations. They then manage their behaviour depending on positive or negative self-reactions within a self-governing system. *Self-Reflectiveness* refers to people self-examining their own functioning by reflecting on themselves and assessing how adequate their thoughts and actions are. The most central mechanism of personal agency is *self-efficacy.* This involves the individual's belief in their capability to exercise some measure of control over their own functioning and environmental events.[124,128]

## Modes of human agency

There are three different modes of human agency:[128] *individual, proxy,* and *collective*. The individual mode reflects that the individual's agency plays a role in activities where they can influence the outcome personally. It emphasises the individual's ability to take initiative and make choices, which can have consequences for the results of their actions in various areas of their lives. However, in many areas of life, individuals have limited direct control over the social conditions and institutional practices that affect their everyday lives. In these contexts, they exercise proxy agency to achieve wellbeing, safety, and desirable outcomes. Proxy agency means that individuals actively seek out others who have access to resources, expertise, or influence, to make them act on their behalf to secure desired outcomes. The effectiveness of proxy agency relies heavily on the individual's perceived social efficacy to successfully engage others in this mediating role.[128] Collective agency refers to cooperation and collaboration between different individuals whose efforts are mutually dependent on each other to achieve a common goal. It is an idea that emphasises the importance of cooperation and combining strengths to face challenges or achieve success. The concept can be applied in different contexts, for example within workgroups, project teams, international relations, or societal development initiatives.[129]

## Triadic reciprocality model

People's behaviour is strongly influenced by the social systems they find themselves in. Therefore, personal agency is about navigating through a complex network of socio-structural influences. The social structures consist of rules, social norms, and sanctions that regulate people's behaviour. Individuals act within these structures with great variation in interpretation, compliance, and sometimes resistance. The relationship between people and society is dynamic and complex, where their behaviour influences and is influenced by the institutions and social norms that surround them. The environment consists of different structures and can be imposed (things we have no control over), chosen (things we actively choose), and constructed (things we create ourselves). These different types of environments require different ways of using personal agency to deal with them. People's

behaviour is shaped by internal personal factors, behavioural patterns, and influences from their environment. It is a mutual influence where all these factors work together and influence each other in two-way communication.[128] Thus, according to SCT,[70,124] human functioning is the result of the interaction of three components: *environment, behaviour, and person* (Figure 1). This means that there is an interplay between these factors that influences each of them in a triadic reciprocal way, where they are all contributing causes to each other. Hence, the person and the environment are not independent causes of human behaviour and such an explanation is overly simplistic. This triadic interplay also applies to observational learning.[70,124]

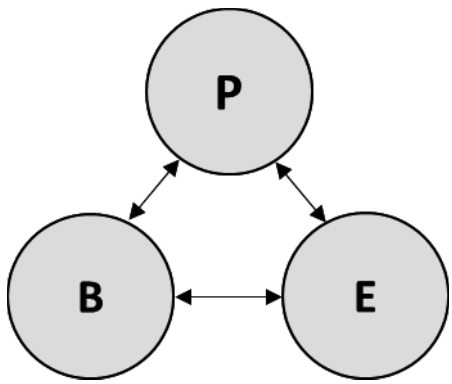



**Figure 1.** The triadic reciprocal interplay in Social Cognitive Theory. P denotes *personal determinants*; B *behavioural determinants*; and E *environmental determinants*.

## Observational learning

In SCT, learning takes place in a social context where there is a dynamic and reciprocal interaction between the *individual*, the *environment,* and the *behaviour*. People learn through *observing* and *modelling* other people's behaviour. Fortunately, much of human behaviour is learned by observing others. Thereby, one can create behavioural rules, which then serve as guidelines for future actions. This saves both time and energy as it allows people to expand their knowledge and skills based on information presented and designed by others. The four subsystems of observational learning in SCT are; *attentional*, *retentional*, *motivational*, and *production*.[70,124]

*Attentional* processes refer to that a prerequisite to learn from a modelled behaviour is to pay attention to it. The learning is dependent on many factors such as the properties of the modelled activities and whether we perceive them as positive, negative, or neutral. Moreover, attentional processes are also dependent on the observer's attributes i.e. their ability to perceive, process, and interpret incoming

impressions. This interpretation is further based on expectations and past experiences, cognitive capabilities, arousal levels, and preferences that develop over time through experience and exposure to different things.[70,124]

*Retention* is another cognitive process in observational learning that is necessary to reproduce an observed behaviour. It includes cognitive constructions in terms of symbolic coding i.e. transforming the key aspects of the modelled actions into symbolic representations (imaginal and verbal) to guide future actions. Further, the individual's ability to organise the new information with existing knowledge, as well as cognitive (mental) and enactive (physical) rehearsal. The better cognitive skills and prior knowledge a person has, the more details the person will perceive as an observer. Through familiarity with the subject and training, experienced individuals can recognise small differences in performance that are indistinguishable to the inexperienced.[70,124]

*Production processes* is the third component of modelling and refers to the translation of previously observed mental representations of actions into practical action. Our mental images (representations) serve as a guide and affect how we act and respond to various stimuli, situations, or tasks that we are faced with. Those who already have the necessary skills can easily integrate them to create new patterns of behaviour. However, in the absence of certain sub-skills, the behaviour may not be executed correctly. In such cases, the sub-skills needed for a certain performance must be developed through observation and practice under guidance, and created in stages where the basic parts must be mastered first. However, converting concepts into corresponding actions without error only occurs rarely on the first try and correct matches are usually attained through corrections of initial efforts based on informative feedback from the behaviour. *Corrective modelling*, where difficult parts of performance are identified and demonstrated by skilled practitioners, is also an effective learning method.[70,124]

Finally, the fourth sub-process that governs observational learning is *motivational processes*. An individual can learn a pattern of behaviour without the desire or willingness to perform it, and the motivational processes are what determine if one will act on what they have learned or not. Learning is seldom applied in practice if negative penalties or adverse incentive conditions inhibit the learned behaviour. In such situations, however, observational learning is quickly transformed into action if positive incentives are introduced.[70] In addition, individuals are motivated to retain what they have learned through observation and by practicing learned responses that they see as useful and meaningful. The term *vicarious reinforcement* refers to how an individual's behaviour can be influenced by witnessing how others, referred to as *models*, are rewarded or punished for their actions. Punishment tends to lower the social status of those observed, while praise and rewards improve it. Changes in the model's status, in turn, affect the extent to which observers pay attention to and shape their actions after the behaviour exemplified by the model.[70,124]

# Critical realism

The British philosopher Ray Bahskar was the originator of the Critical realism (CR) philosophy in 1975.[126] This theoretical position combines positivist and interpretivist research approaches and supposes that one reality exists but can never be completely understood as it is filtered by our limited ability to perceive it. Additionally, reality is mediated by social and cultural values.[130] In his theoretical framework, Bhaskar distinguished between three different levels of knowledge (Figure 2): the *observable*, the *actual,* and the *real*. The observable represents the knowledge we can obtain through direct observation with our senses. Hence, this knowledge is based on what can be experienced and measured objectively. The actual reflects what happens or exists, but which is not always directly visible. This level can be likened to the trunk of a tree, where some parts may be obscured or hidden, but they still form a central and significant part of the tree. The real corresponds to the roots of the tree. This level is invisible and may involve complex and multifaceted factors. It constitutes the fundamental causes or underlying foundations that lead to what is observed at the actual level and what is visible at the observable level.[131] CR realism is further described in the method section.

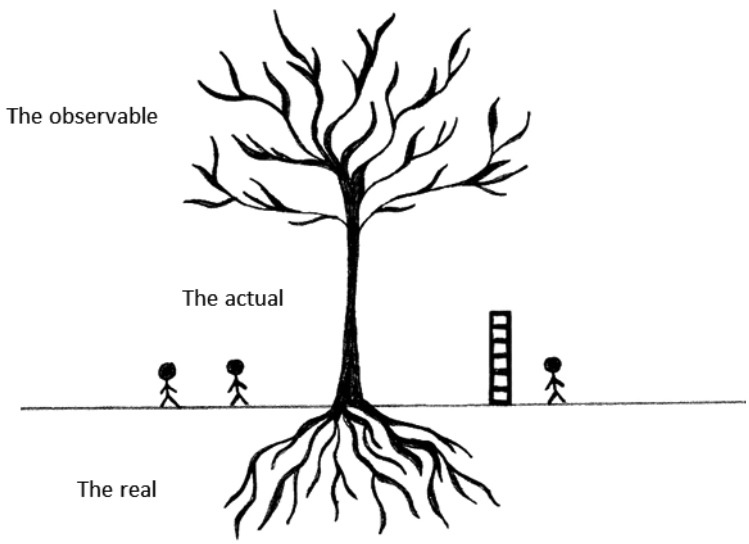



**Figure 2.** The figure illustrates *the observable* (what we observe), *the actual* (what happens but is not always observable), and *the real* (underlying factors that are invisible). © Artwork by Hanna Tern.

# 6. Material and methods

## Thesis design

To evaluate CMA, which is a complex intervention,[6] both qualitative and quantitative research approaches have been used in this thesis. Qualitative methods provide detailed descriptions of subjective experiences, meanings, and processes using words. In contrast, quantitative methods use numerical data and can provide objective measurements of variables and patterns by means of various statistical methods.[132] This combination of qualitative and quantitative methods is commonly termed *triangulation,*[133] and involves using a variety of methods, perspectives, and data sources to give a nuanced understanding of the phenomenon under investigation. Triangulation also seeks to complement and balance the strengths and limitations of each method used, as clinical knowledge involves interpretative action as well as factors related to interaction, such as communication, opinions, and experiences. This means that clinical decisions and care cannot solely be based on findings from controlled trials.[133,134] By incorporating triangulation, I sought to capture a more comprehensive and contextualised picture of CMA from the perspectives of both midwives and women.

## Ontology and epistemology

Two fundamental key concepts in research methodology are *ontology,* which refers to the nature of reality, and *epistemology,* which refers to the methods of gaining knowledge and how it can be justified and validated.[135] Individual philosophical perspectives are underpinned by ontological and epistemological beliefs that guide action in how a researcher derives meanings from data and produces knowledge. Understanding and acknowledging different philosophical approaches to research have been argued to enable a more effective integration of natural and social sciences.[136] This thesis is philosophically underpinned by Critical realism (CR), which is rooted in a realist ontology and a relativistic epistemology. Hence, it agrees with a realist ontology that asserts that there is a reality independent of us, while at the same time the relativistic epistemology implies that our knowledge is subjective and dependent on the person and background.[137] When using qualitative methods, meaning is created from the interplay between subject and object, whereas when conducting quantitative research, the object is considered independent of the subject.[136]

# Data collection and sources

The following section provides a summary of the *Oneplus* trial, including procedures employed for data collection. This will be followed by a brief description of the methods used in each study included in this thesis. More detailed descriptions can be found in the original articles.

## The Oneplus trial

The *Oneplus* study was a multicentre, randomised, controlled trial (M-RCT) with the primary aim of evaluating whether the presence of a second midwife during the active second stage of labour, with the purpose of preventing SPT, would decrease the SPT incidence rate.[6] Moreover, secondary outcomes including maternal and neonatal outcomes as well as the experiences of midwives and women were also evaluated within the trial.[5] The M-RCT included five Swedish obstetric units, from different regions and of different sizes, with annual birth numbers ranging from approximately 2,800 to 5,000. A total of approximately 450 midwives were working at the included obstetric units during the data collection period.

Educational sessions were conducted for midwives who worked at the participating obstetric units prior to the commencement of the study. These sessions covered study design, details regarding the procedure (randomisation, recruitment, completement of clinical report forms), classification of tears, and pelvic floor anatomy. Midwives were instructed to continue with each unit's existing preventive programme to reduce SPT. Apart from being ready to follow the primary midwife's lead and assist the birthing woman when required, no specific guidelines were given regarding the second midwife's role.

Data collection took place between December 10, 2018, and March 21, 2020. Women eligible for participation in the *Oneplus* trial were full term (gestational week ≥37), aged 18-47 years old, nulliparous, or women with one previous caesarean section who were now opting for their first vaginal birth. Additionally, participants needed to have a single living fetus in cephalic presentation and were required to be proficient in Swedish, English, Arabic, or Farsi (Persian). Women who were proficient in Swedish or English were further eligible to receive the one-month and one-year follow-up questionnaires, as the questionnaires were only available in these languages.

A research midwife was responsible for data collection at each participating study site. Once a woman entered the second stage of labour, she was randomly assigned to either receive assistance from one midwife (standard care) or two midwives (intervention). Alongside the group assignment, the randomised envelopes held clinical report forms (CRFs) that were to be completed after each birth by the primary midwife (CRF no 1) and the second midwife (CRF no 2). The selection of the second midwife could be influenced by a number of factors such as being chosen

by the primary midwife, being the first available midwife, self-nomination, or because she happened to be the midwife in charge (coordinator). The primary midwife was told to summon the second midwife when the woman entered the active second stage of labour and the presenting part was visible. The CRFs covered a range of areas, including details regarding the birth, interventions, experiences of CMA, learning, and feedback.

# Overview of studies included in this thesis

All four papers included in this thesis are sub-studies to the *Oneplus* M-RCT,[5,6] and draw upon data collected from the trial. Data was sourced from clinical report forms (CRF 1 and CRF 2) completed by midwives, local databases (Obstetrix Siemens, Cosmic Cambio), a one-month follow up questionnaire completed by women included in the trial, and focus group interviews with midwives working at four of the obstetric units participating in the trial.

**Table 1.** Overview of Papers I-IV.

| Paper | Aim | Study design, data sources & analytical approach |
|---|---|---|
| I | To explore midwives' experiences of collegial midwifery assistance during the second stage of labour. | A qualitative design using reflexive thematic analysis based on five focus group interviews with midwives who participated in the *Oneplus* trial *(N* = 37). |
| II | To investigate primary midwives' experiences of collegial midwifery assistance with the purpose of preventing SPT during the active second stage of labour. | An observational design with data from the *Oneplus* trial. Descriptive statistics, univariable and multivariable logistic regression. *(N=1430)* |
| III | To investigate women's experiences of being assisted by two midwives with the purpose of preventing SPT during the active second stage of labour, and to further explore possible factors influencing the women's experiences of CMA. | A cohort study with survey data from women one-month post-partum and data collected in the *Oneplus* trial. Descriptive statistics, univariable and multivariable logistic regression. *(N=1050)* |
| IV | To investigate learning experiences of primary and second midwives with varying levels of work experience when practicing CMA, and to further explore possible factors that influence their learning. | An observational design with data from the *Oneplus* trial. Descriptive statistics, proportion calculations, and univariable and multivariable logistic regression. *(N=1430).* |

# Methods used in Papers I-IV

## Paper I

*Design and participants*

Paper I presents a qualitative study including five focus group interviews that included a total of 37 midwives working in four of the five obstetric units participating in the *Oneplus* trial.

*Data collection*

Data was collected from March to November 2019. To gauge interest in participation, an email containing information was sent out to all midwives working at the obstetric units participating in the *Oneplus* trial. Purposive sampling[138] was primarily used to ensure a diverse participant group in terms of age, length of work experience, and type of shift work. The interviews were conducted by three of the researchers in the team individually acting as moderators (CR for FG 1 & 3, MEd for FG 2 & 4, and HT for FG 5). The primary question: '*Can you tell me about your experiences of having another midwife present during the second stage of labour?*' initiated the discussions. A topic guide served as a reference and probing tool to ensure that the discussions stayed on track and were aligned with the intended purpose. The guide was primarily focused on potential advantages and disadvantages, challenges, learning, and feedback related to using the CMA intervention. However, the topic guide was utilised with flexibility to get a broad range of views from the participants. During the interviews, the assistant moderator supported in notetaking and posed questions when needed. Interview durations ranged from 1 hour and 15 minutes to 1 hour and 41 minutes. After the fifth interview, data collection concluded as the collected material was considered substantial and it was deemed that additional interviews would not offer further contributions.[139] The discussions were recorded and transcribed verbatim.

**Table 2.** Details on focus group interviews and participant characteristics.

| Focus group | | | Participants | | | Birth unit |
|---|---|---|---|---|---|---|
| No | Month and year | Duration (minutes) | Count (n=37) | Age range (years) | Average age (median) | Work experience range (years) |
| 1 | March 2019 | 101 | 9 | 31 - 59 | 44 (42) | <1 - 16 |
| 2 | April 2019 | 91 | 6 | 27 - 46 | 36 (36) | 1 - 10 |
| 3 | May 2019 | 74 | 9 | 26 - 52 | 36 (31) | <1 - 9 |
| 4 | September 2019 | 80 | 8 | 37 - 64 | 49 (47) | 2 - 24 |
| 5 | November 2019 | 76 | 5 | 28 - 55 | 37 (32) | 1 - 21 |

Focus group discussion with midwives.
© Artwork by midwife Gabriella Aichholzer Hedström

## Papers II and IV

*Design and participants*

Papers II and IV employ an observational design, utilising data obtained from the *Oneplus* trial. The studies include responses from midwives who worked in participating obstetric units during the period December 10, 2018, to March 21, 2020, attending the births of women included in the *Oneplus* trial. Of the 3,776 randomised women in the trial, 3,059 gave birth spontaneously. Of those, 1,546 were assigned to the intervention - to receive a second midwife during the active second stage of labour. However, a total of 116 women were excluded from the analyses, primarily due to the unavailability of a second midwife at the time of birth.[6] See Figure 3 for a flowchart illustrating the number of women who participated in the CMA intervention and exclusions. Box 1 presents items from CRF no 1 evaluating the primary midwife's experiences of the CMA intervention (Paper II). The two items regarding learning outcomes (Paper IV) are presented later in the analysis section.

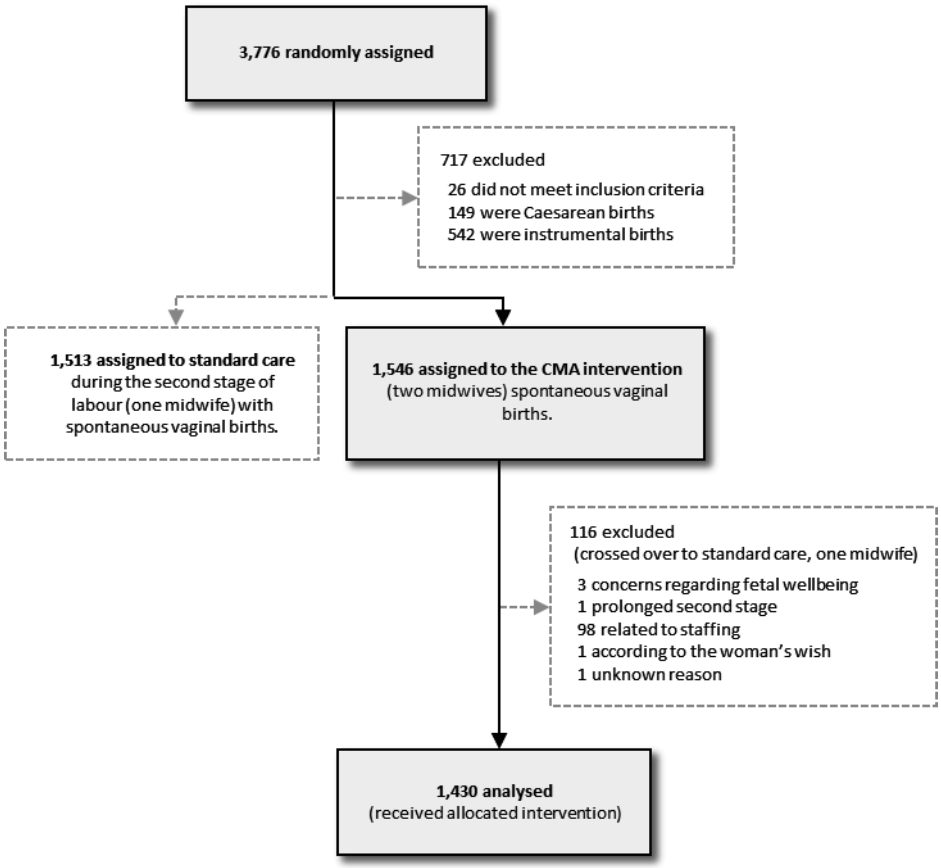



**Figure 3**. A flowchart showing the number of women included in the *Oneplus* trial who were randomised to the CMA intervention.

**Box 1.** Items from CRF no 1 evaluating the primary midwife's experiences of CMA (Paper II).

**Items describing the primary midwife's experiences of CMA**

- Felt confident with a colleague present
- Experienced having a colleague present as positive
- Experienced having a colleague present as disturbing
- Experienced having a colleague present as stressful
- Felt scrutinised when a colleague was present
- Experienced that the second midwife took up too much space
- Found it difficult to know her role when a colleague was present
- Found it difficult to communicate with the woman giving birth when a colleague was present
- Experienced that the second midwife forced the pushing

## Paper III

*Design and participants*

Paper III is a cohort study using data derived from a follow-up questionnaire sent to women one month postpartum and the *Oneplus* trial.[6] The study-specific questionnaire was developed and validated by the research group, with ten women who had given birth spontaneously one to three months earlier participating in a validation process. A modified think-aloud process was used to evaluate the items in terms of content, phrasing, and understanding.[140] The items were subjected to iterative validation, entailing minor modifications subsequent to each evaluation. The questionnaire consisted of 83 items that covered diverse aspects such as sociodemographic background, maternal health (both physical and mental), experiences of the second stage of labour, breastfeeding, and postpartum depression.[5] For the present study, variables regarding background and a subset of variables targeting women's experiences of the CMA intervention was used.

To be eligible to participate, women had to be proficient in either Swedish or English as the questionnaire was exclusively available in these languages. The Swedish version was available both online and in paper format, while the English version was exclusively available on paper. Figure 4 illustrates the survey distribution process along with reminders for both the English and Swedish versions to increase the response rates. Moreover, an overview of data sources for the variables used in Paper III is presented in Box 2, and the questionnaire items pertaining to women's experiences of the CMA intervention are presented in Box 3.

A total of 1,050 women who received the CMA intervention responded to the one-month follow-up questionnaire (Figure 5).

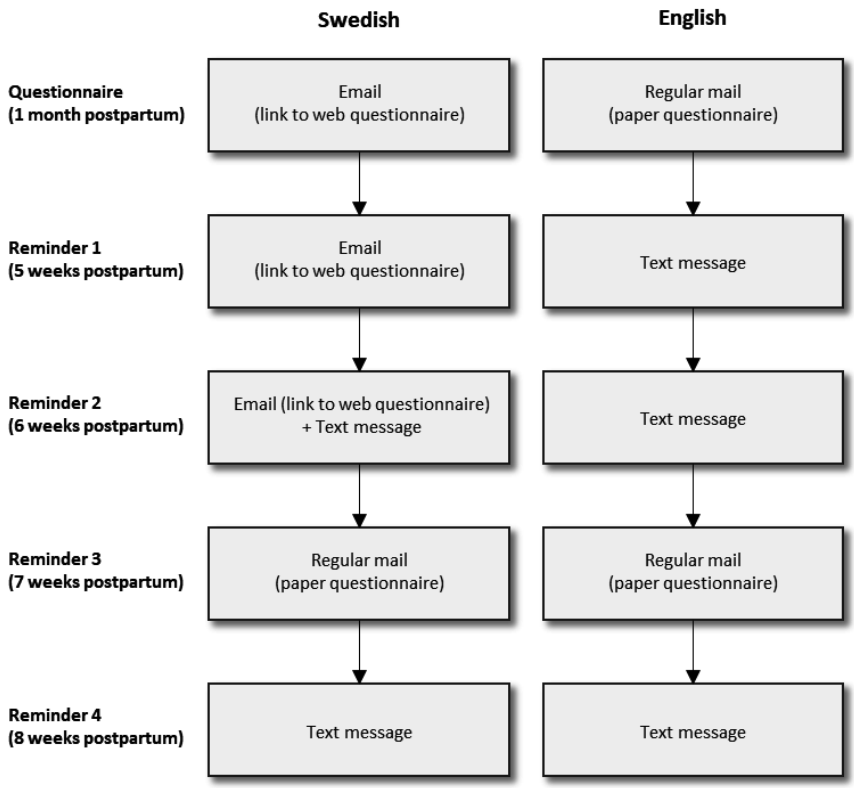



**Figure 4.** The survey distribution and reminders process for the English and Swedish versions.

**Box 2.** Overview of data sources for the variables used in Paper III.

**Background, labour and birth variables from the Oneplus trial**

- Maternal age
- Parity
- BMI
- Presence of chronic diseases
- Onset of labour
- Augmentation with Oxytocin
- Epidural
- Duration of second stage of labour
- Role of the second midwife
- Duration of collegial assistance
- Primary midwife's experience of CMA
- Birth position
- Episiotomy
- SPT
- Apgar score
- Birth weight
- Admission to NICU
- Postpartum haemorrhage

**Background variables used from the one-month follow-up questionnaire**

- Native language
- Marital status
- Educational attainment
- Fear of birth
- Pregnancy complications
- Women's experiences of CMA

**Box 3.** Items for assessing women's experiences of the CMA intervention in the one-month follow-up questionnaire.

**Items describing womens' experiences of CMA**

- An additional midwife present during the second stage of labour made me feel safe.
- An additional midwife present during the second stage of labour made it feel like there were too many people present in the birthing room.
- An additional midwife present during the second stage of labour made me feel stressed.
- My concentration was disrupted by the additional midwife who was present during the second stage of labour.
- It was important for me to have an additional midwife present during the second stage of labour.
- If I give birth again, I would like to have an additional midwife present during the second stage of labour.

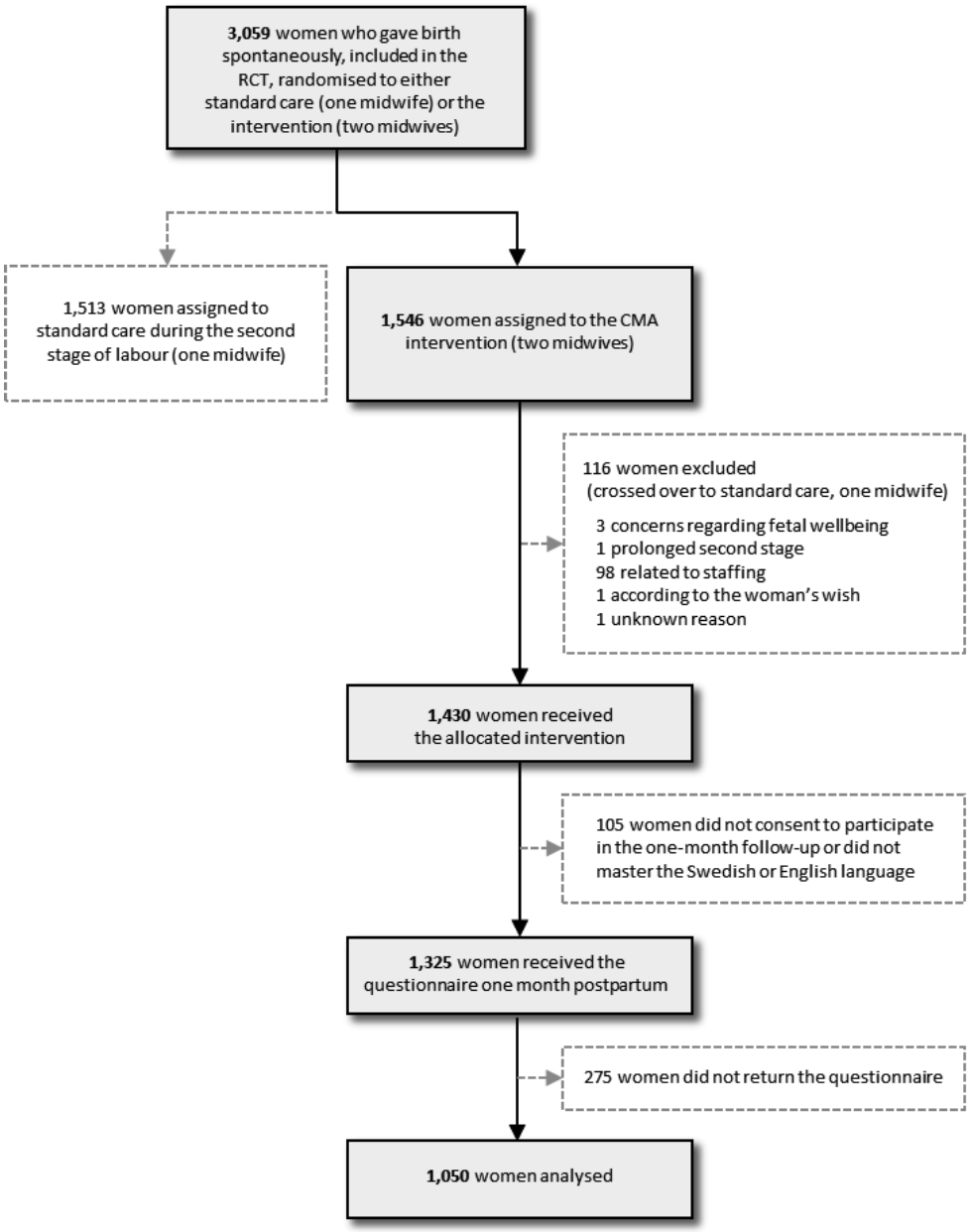



**Figure 5**. Women who participated in the *Oneplus* trial, received the intervention, and completed the one-month follow-up questionnaire.

# Analyses

## Paper I

*Analytical approach*

The study used *Reflexive Thematic Analysis* (TA), as described by Braun and Clarke, to analyse qualitative data.[141-143] The aim of this kind of pattern-based approach is to identify and interpret patterns in what people say and, in some cases, why they say it in a data set.[144] TA was found to be a suitable analytical approach as this study sought to identify patterns in the midwives' narratives on their experiences of CMA.

TA as outlined by Braun and Clarke, is a *method* rather than a *methodology*. This is in contrast to many other qualitative analytic approaches that provide theoretically informed frameworks for conducting research such as Grounded Theory or Interpretive Phenomenological Analysis (IPA). TA is characterised by its theoretical flexibility, which means that it can be used, depending on the research question, within different frameworks. Consequently, the researcher must actively navigate different theoretical assumptions during the research process.[141-144] This study was underpinned by a critical realist position, since the aim was to comprehend the experiential perspective of CMA from the midwives' lived realities.[143]

A six step analysis process was applied, entailing: (1) Data familiarisation, (2) Creation of codes, (3) Uniting codes into themes, (4) Reviewing themes, (5) Defining and naming themes (identifying the essence of each theme); and (6) Creation of a report of the findings.[141,143] The data were inductively coded, predominantly at a semantic level. This means that the analysis was guided by the content of the data rather than preconceived concepts separate from the data themselves, close to the participants' individual sense-making of their experiences.[144] The analysis was conducted using the software NVivo, 12th version.

## Paper II

*Statistical analysis*

Nine items from the CRF 1 specifically concerning the primary midwives' experiences of the CMA intervention were subject to descriptive analysis. Two of the items were selected as outcomes: (1) '*Felt confident with a colleague present'* and (2) '*Experienced having a colleague present as positive'*. The items were rated on a four-point Likert scale ranging from 1 (Completely agree) to 4 (Disagree) and were subsequently dichotomised by collapsing the response option *Completely agree* contrasted with *Mostly agree*, *Partially disagree* and *Disagree*.[145,146]

Explanatory variables used in the analyses pertained to circumstances around the CMA intervention.

Descriptive statistics were calculated and univariable and multivariable logistic regressions were performed to obtain the crude and adjusted odds ratios with 95% confidence intervals (CIs) for the outcome variables in relation to each of the explanatory variables. The web-based software *Directed Acyclic Graphs* (DAGs) was used to identify potential confounding variables[147] and IBM SPSS Statistics for Windows, Version 25.0, was used for data analysis.

## Paper III

*Statistical analysis*

Six items from the questionnaire capturing women's experiences of the CMA intervention were presented descriptively. Two of the these were selected as outcomes: (1) '*An additional midwife present during the second stage of labour made me feel safe'* and (2) '*If I give birth again, I would like to have an additional midwife present during the second stage of labour'*. The response options, on a five-point Likert scale, including *Strongly agree, Mostly agree, Agree in part, Disagree*, and *Unsure*, were dichotomised, with *Strongly agree* being contrasted with the other alternatives.[145,146]

Explanatory variables pertaining to background, the birth, and the intervention were used and analysed separately. The analysis consisted of descriptive statistics and both univariable and multivariable logistic regression. Potential confounders were identified using DAGs as described in Paper II above. All analyses were performed using IBM SPSS Statistics for Windows, version 28.0.

## Paper IV

*Statistical analysis*

Two items from the CRFs were used as outcomes to investigate both the primary and second midwives' learning. To investigate the primary midwives' learning, the item '*I learnt something from the second midwife'* from CRF no 1 was used. This item, rated on a four-point Likert scale *(1=Completely agree, 4=Disagree)*, was dichotomized into *Completely agree*, *Mostly agree,* and *Partially disagree* versus *Disagree* for analysis. Moreover, the item '*Have you learnt something from being the second midwife on this occasion'* (response options yes/no) from CRF no 2 was used to investigate the second midwives' learning.

Explanatory variables that were hypothesised to influence learning were used in the analyses. Descriptive statistics and the proportions of learning for both primary and second midwives across different groups of work experience (<2 year, 2-5 years, 6-

20 years and >20 years) were calculated in relation to the explanatory variables (number of births where learning was reported divided by the total number of births in each group). Confidence intervals for each proportion were computed using Jeffery's method.[148]

Logistic regression models stratified by work experience for both the primary and second midwives were thereafter created. Within each sub-group, separate univariable and multivariable logistic regression analyses were performed to assess associations between the explanatory variables and learning, and to explore possible interaction effects. The models were adjusted for study site. Data was analysed using IBM SPSS Statistics for Windows, version 28.0.

# Ethical considerations

The four studies were conducted in accordance to the World Medical Declaration of Helsinki[149] and obtained ethical approval from the Regional Ethics Board of Lund University in July 2018 (no. 2018-476). Written and oral informed consent were obtained from all participating women and midwives at each study site. The research followed the four main principles of research integrity stated by the European code text for research and privacy *ALLEA*.[150] These principles encompass *Reliability,* ensuring the quality of research through robust design, methodology, analysis, and effective utilisation of resources; *Honesty,* that the whole research process from design to disseminating is conducted in an open, fair, complete, and unbiased manner; *Accountability,* taking responsibility for the research from conception to publication, as well as for its management and organization; and *Respect,* which concerns showing respect for colleagues, research participants, society, ecosystems, cultural heritage, and the environment, including considering ethical aspects and the social consequences of the research. The research also followed ICM's Ethical code for midwives and the four ethical principles *Autonomy*, *Non-maleficence*, *Justice*, and *Beneficence*, which were adhered to and subsequently deliberated upon.[151,152]

In order to uphold the participants' autonomy, ethical approval required informed consent not only from participating women, but also from the midwives who served as study subjects in Papers I, II, and IV. Before the focus group interviews started, participants were informed of the study's purpose and that their involvement in the interviews was voluntary. They were also assured that data confidentiality would be upheld through anonymisation. Moreover, due to some of the items in the CRFs completed by the midwives being considered as potentially sensitive to respond to, as they addressed experiences of having a colleague present or being present in the birthing room and their colleague's approach to work, two different CRFs were used. Once completed, they were deposited in a locked letterbox to ensure the confidentiality and integrity of the midwives. Concerning the focus groups, there

was a potential risk of sensitive discussions emerging,[132] or the potential for discomfort in discussing certain issues, but we reasoned that the benefits gained from the research outweighed the potential risk of harm. Regarding the justice considerations, it is warranted to consider the inclusion criteria and the fact that the one-month follow-up questionnaire was only available in English or Swedish. Consequently, those who lacked proficiency in these languages were not given the chance to voice their viewpoints.

# 7. Results

This chapter begins with a summary of the results from the individual Papers I-IV. For detailed tables and figures, refer to the original articles. In order to gain a more comprehensive understanding of the complexity of the CMA intervention, the results from the four papers are further synthesised using the theoretical framework *Social Cognitive Theory* (SCT) developed by Albert Bandura.[124]

## Summary of findings in Papers I-IV

### Paper I

In Paper I,[153] the experiences of CMA among midwives were explored through five focus group interviews (n=37). The reflexive thematic analysis generated four key themes: (I) *challenging the professional role*, (II) *a balancing act between different roles*, (III) *not just why and how, but who*, and (IV) *a potential arena for learning* (Figure 6).

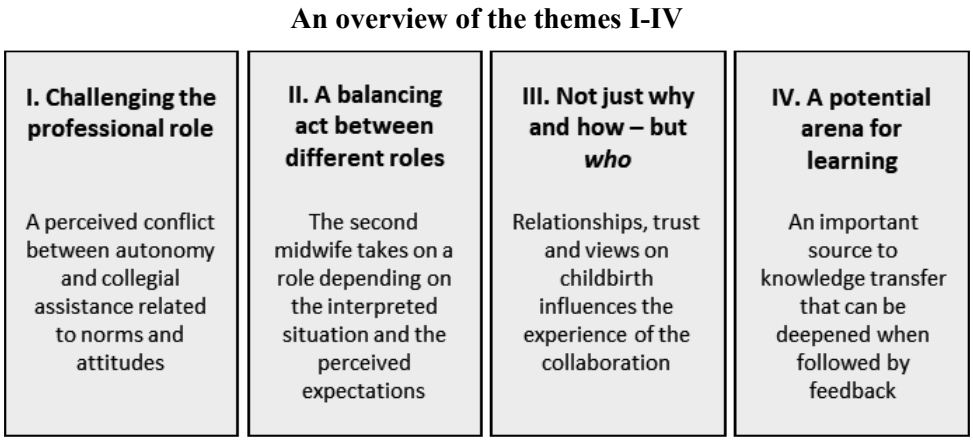



**Figure 6.** An overview of the four key themes generated from the analysis.

The first theme, *Challenging the professional role,* reflects a perceived conflict between midwives' autonomy and CMA, grounded in norms and attitudes and linked to an established image of the midwife as *strong and independent*. Having a colleague present during childbirth sometimes led to a loss of control, involving the sharing of responsibility with a colleague. For the primary midwife, this could result in a feeling of being scrutinised, while the second midwife could get a sense of intrusion and find it difficult to interfere and question the colleague. Nevertheless, they expressed a sense of strength when they collaboratively addressed challenges and supported the birth through shared problem solving. The midwives also emphasised the importance of deciding for themselves whether to have a college present in the birthing room or not.

The second theme, *A balancing act between different roles*, reflects that the second midwife took on different roles in the birthing room depending on the midwives' mutual expectations and interpretations of the situation. Thus, the second midwife's presence became a balancing act, where she sought to follow the primary midwife's lead - acting according to what she thought was expected - while trying not to disturb the woman or the primary midwife. The second midwife's role could be *supportive,* involving conducting various practical tasks, providing support, and affirming the primary midwife's decisions. Further, she might also bring new energy into the room during prolonged second stages. However, if the expected role was largely task oriented, it could be perceived as *superfluous* in cases when it was constituted solely by presence and observation. Since the second stage of labour is considered to be an extremely sensitive phase of childbirth, depending on the situation and atmosphere in the birthing room, the role could even end up being *disturbing*, which was particularly pronounced in cases when the second midwife arrived late in the second stage of labour when the birth was imminent.

The third theme, *Not just why and how, but who,* highlights that the relationship between the colleagues influenced the midwives' experiences of CMA. Differences in views regarding how to handle the birth could result in locked positions and serve as an obstacle to successful collaboration. Factors such as personal chemistry, clinic size, and whether the midwives had previously had the opportunity to work together or not could further influence the interaction. If the midwives had previously worked together on multiple occasions, communication could take place non-verbally, facilitated by an understanding of each other's line of reasoning. The relationships between colleagues could impact the atmosphere in the birthing room, which the midwives believed could be sensed by the woman. In certain instances, the second midwife was favoured due to her ability, based on experience, to address a specific problem, while at other times, personal preference played a role. The second midwife's attitude and approach toward the primary midwife influenced the CMA experience in that scenario, sometimes resulting in a fruitful collaboration characterised by a climate of unrestricted expression and open communication or,

conversely, a less positive experience when there was lack of respect from the second midwife.

The final theme, *A potential arena for learning,* underscores that CMA could contribute to a valuable transfer of knowledge between the midwives, regardless of their length of work experience. The intervention provided midwives with the opportunity to be present at different births, involving observing colleagues and this could lead to new input for the mid- to late-career midwives. This in turn could result in the adoption of new techniques and a willingness to shift from a more active to a more passive management of births. Knowledge transfer took place both by observing and being observed, and learning was sometimes extended beyond the delivery room through reflection and feedback. Although feedback was desirable, it was frequently hindered due to lack of time and a lack of established strategies for providing it. Furthermore, a mutual willingness among midwives to both give and receive feedback was required, but not always present.

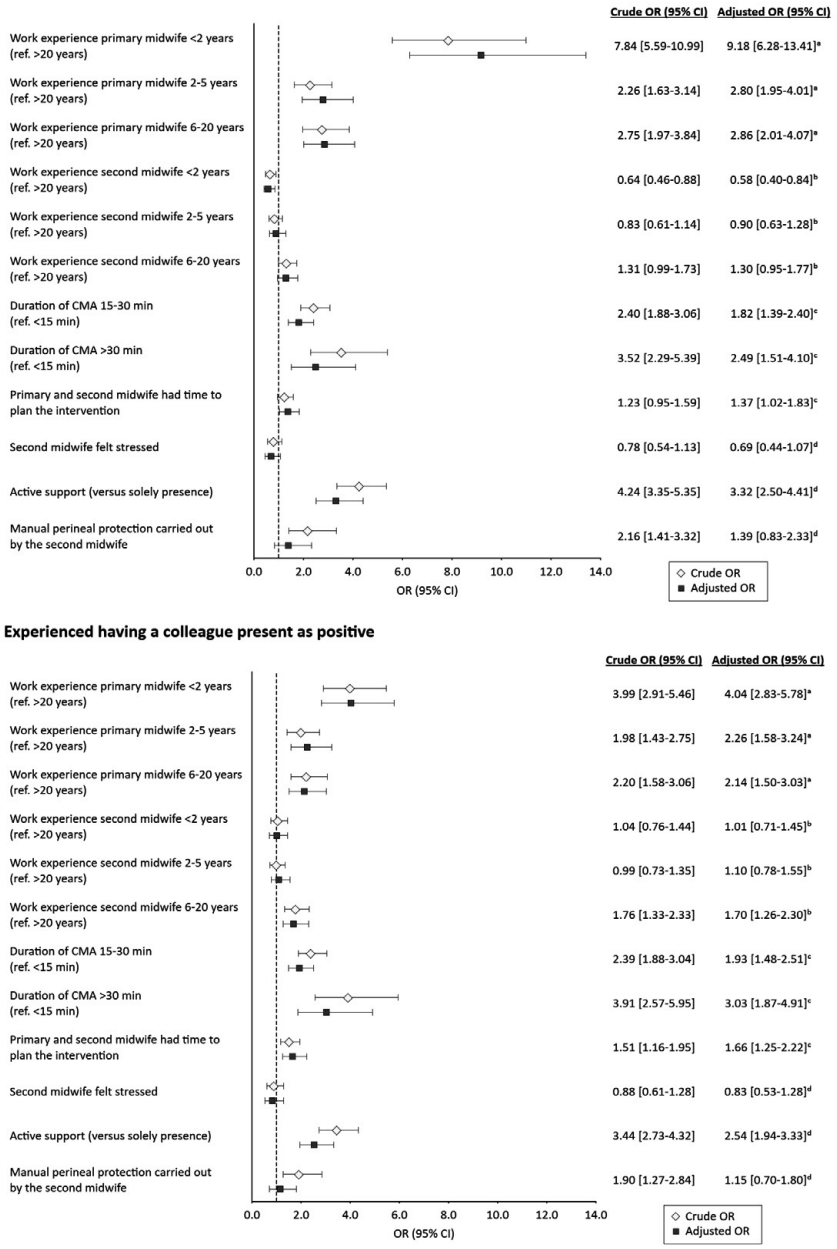
## Paper II

Paper II[154] investigated the primary midwives' experiences of having a second midwife present during the active second stage of labour. A total of 1,430 births involving the presence of two midwives were analysed. In approximately one-third of the births, the primary midwives had less than two years of work experience, while the majority of second midwives had more than six years of work experience. The median duration for CMA was 15 minutes, with about half of the births involving the primary midwife requesting assistance solely for presence. In one fifth of cases, assistance was only requested because of the ongoing trial. The most common forms of assistance provided by the second midwife were communication with the birthing woman and the interpretation of CTG readings, both of which occurred in approximately one out of every four births. The key findings from this study show that at the majority of the births, the primary midwives reported completely agreeing with feeling confident (61%) and positive (56%). In contrast, the primary midwife reported feelings of stress, scrutiny, disturbance, or other unintended side effects in only a minority of the births (See Table 3).

**Table 3.** The primary midwife's experience of CMA at each of the 1,430 births.

| | **Completely agree** n (%) | **Mostly agree** n (%) | **Partially disagree** n (%) | **Disagree** n (%) | **Missing data** n (%) |
|---|---|---|---|---|---|
| Felt confident with a colleague present. | 873 (61.0) | 151 (10.6) | 190 (13.3) | 180 (12.6) | 36 (2.5) |
| Experienced having a colleague present as positive | 801 (56.0) | 213 (14.9) | 200 (14.0) | 155 (10.8) | 61 (4.3) |
| Experienced having a colleague present as disturbing | 41 (2.9) | 19 (1.3) | 110 (7.7) | 1222 (85.5) | 38 (2.7) |
| Experienced that the second midwife took up too much space | 9 (0.6) | 14 (1.0) | 61 (4.3) | 1314 (91.9) | 32 (2.2) |
| Experienced having a colleague present as stressful | 8 (0.6) | 13 (0.9) | 72 (5.0) | 1306 (97.8) | 31 (2.2) |
| Felt scrutinised when a colleague was present | 7 (0.5) | 13 (0.9) | 115 (8.0) | 1264 (88.4) | 31 (2.2) |
| Found it difficult to know her role when a colleague was present | 4 (0.3) | 12 (0.8) | 90 (6.3) | 1292 (97.8) | 32 (2.2) |
| Found it difficult to communicate with the birthing woman when a colleague was present. | 3 (0.2) | 6 (0.4) | 89 (6.2) | 1296 (90.6) | 36 (2.5) |
| Experienced the second midwife forcing the pushing | 7 (0.5) | 4 (0.3) | 22 (1.5) | 1358 (95.0) | 39 (2.7) |

The primary midwives' experiences of CMA were influenced by both the primary and second midwives' length of work experience. This was most pronounced among the primary midwives with less than two years of work experience, who were more likely to feel confident (aOR 9.18, 95% CI: 6.28-13.41) and positive (aOR 4.04, 95% CI: 2.83-5.78) with a second midwife in the room than the reference group with more than 20 years of experience (Figure 7). Other factors that were positively associated with experiences of CMA were an intervention duration of 15 minutes or more, the opportunity for planning, and the provision of active support from the second midwife.




*Adjusted for study site.

†Adjusted for study site, work experience primary midwife.

‡Adjusted for study site, work experience primary midwife, work experience second midwife, high risk of perineal trauma (perceived by the primary midwife).

§Adjusted for study site, work experience primary midwife, work experience second midwife, high risk of perineal trauma (perceived by the primary midwife), time of collegial assistance.

**Figure 7.** The primary midwife's experience of CMA in relation to explanatory variables.

## Paper III

In Paper III, the focus shifted to the women's experiences of the CMA intervention. Of the 1,430 women who underwent the intervention, 1,050 responded to the one-month follow-up questionnaire, resulting in a response rate of 79.2% (Figure 5).

The key findings from this study indicated that the CMA intervention was well-accepted by women, with 35.8% strongly agreeing that they felt safe, and 42.6% expressing a willingness to have an additional midwife present at a subsequent birth (Table 4). Small minorities reported unintended side effects such as feeling there were too many people in the birthing room (2.8%), feeling stressed by an additional midwife being present during the active second stage of labour (0.7%), or being disrupted in their concentration by CMA (1.2%).

Women who had lower educational attainment and who did not have Swedish as their mother tongue felt safer with the CMA intervention (aOR 1.57, 95% CI 1.15-2.15 and aOR 1.56, 95 % CI 1.14-2.14 respectively). They were also more inclined to want the CMA intervention in the event of a subsequent birth. This was also observed among women experiencing FOB (aOR 1.61, 95% CI 1.15-2.25). The duration of CMA was the most significant factor associated with the women's experiences, with 15 minutes or more resulting in higher satisfaction levels (Table 5). Other factors, such as the provision of active support by the second midwife, were also linked to women feeling safer with CMA (aOR 1.43, 95% CI 1.03-1.99). Moreover, if the second midwife introduced herself to the woman prior to the intervention or if the primary midwife experienced the intervention as positive, these factors were associated with women being inclined to have the CMA intervention at a subsequent birth (aOR, 1.38, 95% CI 1.02-1.88 and aOR 1.38, 95% CI 1.01-1.90). No associations regarding adverse maternal or neonatal outcomes and women's experiences were observed.

**Table 4.** Women's experiences of the CMA intervention (N=1,050).

| | Strongly agree n (%) | Mostly agree n (%) | Agree in part n (%) | Unsure n (%) | Disagree n (%) |
|---|---|---|---|---|---|
| An additional midwife present during the second stage of labour made me feel safe. | 328 (35.8) | 209 (22.8) | 176 (19.2) | 121 (13.2) | 83 (9.1) |
| An additional midwife present during the second stage of labour made it feel like there were too many people present in the birth suite. | 26 (2.8) | 21 (2.3) | 64 (7.0) | 41 (4.5) | 765 (83.4) |
| An additional midwife present during the second stage of labour made me feel stressed. | 6 (0.7) | 8 (0.9) | 29 (3.2) | 31 (3.4) | 843 (91.9) |
| My concentration was disrupted by the additional midwife who was present during the second stage of labour. | 11 (1.2) | 11 (1.2) | 47 (5.1) | 20 (2.2) | 827 (90.3) |
| It was important for me to have an additional midwife present during the second stage of labour. | 165 (18.0) | 180 (19.6) | 217 (23.7) | 109 (11.9) | 246 (26.8) |
| If I give birth again, I would like to have an additional midwife (total of two midwives) present during the second stage of labour. | 391 (42.6) | 182 (19.8) | 135 (14.7) | 149 (16.2) | 61 (6.7) |

*All percentages are in relation to valid answers. Missing data is not presented in the table.

**Table 5.** Women's experiences of the CMA intervention in relation to intervention-related explanatory variables (N=1,050).

| | The woman felt safe with an additional midwife present | | The woman is inclined to have CMA at a subsequent birth | |
|---|---|---|---|---|
| | Crude OR | Adjusted OR | Crude OR | Adjusted OR |
| Second midwife introduced herself in advance | 1.20 (0.88-1.63) | 1.12 (0.81-1.54)[a] | 1.43 (1.06-1.93) | 1.38 (1.02-1.88)[a] |
| Duration of collegial assistance 15-30 minutes (ref. <15 minutes) | 1.73 (1.28-2.36) | 1.78 (1.28-2.47)[b] | 1.53 (1.14-2.06) | 1.53 (1.11-2.10)[b] |
| Duration of collegial assistance >30 minutes (ref. <15 minutes) | 2.08 (1.34-3.23) | 2.32 (1.43-3.75)[b] | 2.07 (1.35-3.20) | 2.14 (1.34-3.43)[b] |
| Active support (versus solely presence) | 1.59 (1.19-2.12) | 1.43 (1.03-1.99)[c] | 1.52 (1.15-2.00) | 1.35 (0.99-1.85)[c] |
| Primary midwife felt confident with a colleague present | 1.26 (0.94-1.68) | 1.13 (0.80-1.59)[d] | 1.45 (1.10-1.91) | 1.38 (0.99-1.91)[d] |
| Primary midwife experienced having a colleague present as positive | 1.48 (1.12-1.97) | 1.32 (0.95-1.84)[d] | 1.48 (1.13-1.95) | 1.38 (1.01-1.90)[d] |

[a] Adjusted for study site.
[b]Adjusted for study site, work experience primary midwife, fear of birth, Swedish as native language.
[c]Adjusted for study site, work experience primary midwife, fear of birth, Swedish as native language, duration of collegial assistance.
[d] Adjusted for study site, work experience primary midwife, fear of birth, Swedish as native language, duration of collegial assistance, active support.

## Paper IV

Paper IV investigated the learning experiences of the primary and second midwives while practicing the CMA intervention. Of the 1,430 births included in the study, 47% of the primary midwives agreed that they learnt something new to at least a certain degree. The corresponding number for the second midwives was 38%. The primary and second midwife engaged in reciprocal feedback in nearly three out of four births (70%).

Key findings in this study revealed that CMA provided embedded learning, which was observed by both primary and second midwives across all groups of work experience. If the primary midwife had a work experience of less than two years, new learning was reported in approximately three out of four births (76%, 95% CI 72-80%). Moreover, in the most experienced group (work experience >20 years), new learning was reported in more than one in five births (22%, 95% CI 17-27%). The most junior midwives claimed to learn something new when acting as the second midwife in about three out of five births (61%, 95% CI 55-67%), whereas the most senior midwives reported learning in one out of four births (26%, 95% CI 22-30%).

The colleague's level of work experience had an impact on learning for both the primary and second midwife. However, the stratified analyses (Table 6 and 7) revealed that for the primary midwife, this impact was only observed among the early career midwives and no associations were found for the mid-to-late career midwives. Nonetheless, this association could be observed when acting as the second midwife. Reciprocal feedback was associated with increased learning among primary midwives but was only of minor significance when acting as a second midwife. A duration of CMA of 15 minutes or longer impacted both the primary and second midwives' learning across all groups of work experience but had the strongest impact among primary midwives with less than two years of work experience (aOR 4.60, 95% CI 2.72-7.78).

**Table 6.** Primary midwife's learning from CMA (N=1,430).

| | Work experience primary midwife* | | | |
|---|---|---|---|---|
| | **<2 years** | **2-5 years** | **6-20 years** | **>20 years** |
| Work experience – second midwife | | | | |
| <2 years | Ref. | Ref. | Ref. | Ref. |
| 2-5 years | 1.78 (0.83-3.84) | 2.37 (1.04-5.42) | 1.45 (0.56-3.79) | 1.14 (0.30-4.33) |
| 6-20 years | 2.89 (1.33-6.26) | 2.98 (1.35-6.61) | 1.59 (0.69-3.67) | 2.93 (0.84-10.18) |
| >20 years | 3.83 (1.76-8.36) | 3.84 (1.75-8.42) | 1.05 (0.42-2.58) | 2.26 (0.66-7.80) |
| Reciprocal feedback | 2.75 (1.59-4.76) | 1.47 (0.76-2.86) | 3.83 (1.78-8.24) | 2.55 (1.16-5.60) |
| Duration CMA ≥15 min | 4.60 (2.72-7.78) | 1.97 (1.14-3.40) | 2.27 (1.28-4.06) | 2.16 (1.08-4.30) |

* Adjusted for study site and explanatory variables.
Only adjusted values are presented.

**Table 7.** Second midwife's learning from CMA (N=1,430).

| | Work experience second midwife* | | | |
|---|---|---|---|---|
| | **<2 years** | **2-5 years** | **6-20 years** | **>20 years** |
| Work experience – primary midwife | | | | |
| <2 years | Ref. | Ref. | Ref. | Ref. |
| 2-5 years | 1.73 (0.80-3.74) | 1.59 (0.80-3.35) | 1.80 (0.96-3.37) | 1.81 (0.88-3.72) |
| 6-20 years | 3.34 (1.32-8.44) | 1.15 (0.51-2.57) | 1.29 (0.72-2.32) | 2.32 (1.13-4.77) |
| >20 years | 2.46 (0.81-7.46) | 0.87 (0.39-1.98) | 2.32 (1.18-4.59) | 2.72 (1.37-5.42) |
| Reciprocal feedback | 1.42 (0.75-2.67) | 1.25 (0.63-2.48) | 2.50 (1.37-4.59) | 1.69 (0.94-3.03) |
| Duration CMA ≥15 min | 2.47 (1.29-4.70) | 2.37 (1.34-4.17) | 1.33 (0.82-2.15) | 2.07 (1.20-3.57) |

* Adjusted for study site and explanatory variables.
Only adjusted values are presented.

## A synthesis of the four papers through the lens of Social Cognitive Theory – Triadic reciprocal causation

*A theoretical understanding of midwives' and women's experiences of CMA*

The four papers investigated the experiences of midwives and women regarding CMA. When applying the perspective of SCT,[125] their experiences were shaped by the impressions that each person received, partly from the environment, but also from observations of the behaviour and personal traits of others and themselves. These experiences were then, according to a critical realist perspective,[130,137] filtered through individual preconceptions before finally being reported. These experiences

included aspects such as the perceived role of the second midwife (Paper I), the primary midwife's level of confidence when having a colleague present (Paper II), feelings of safety reported by the woman (Paper III), and the learning experiences of primary and second midwives during the intervention (Paper IV).

According to SCT[70], the experiences reported in the studies were not lived or reported by passive bystanders, but by active agents - the midwives and women – who have the capability to evaluate and influence both courses of action and perceived impressions. Also, this agency cannot be explained solely on the basis of a simple model where behaviour is controlled by the person and the environment, i.e. where the midwives, women, and the environment are viewed as *independent* causes of behaviour. Rather, person, environment, and behaviour interact and mutually influence each other in a triadic reciprocal way. Upon a comprehensive investigation of SCT,[70,124,128] it was clear that the model of triadic reciprocal causation could be used as a foundation for a synthesis to get a unified multi-dimensional and theoretical understanding of midwives' and women's experiences during the active second stage of labour when practicing CMA. The theoretical concepts explained earlier in Chapter 5 are intended to provide a basis for the understanding of this synthesis, although the original theory of triadic reciprocal causation was adapted to fit within the context of the current research as described below.

The birthing situation with CMA involves the interaction between the determinants of each person (the primary midwife, the second midwife and the woman) becoming involved in a reciprocal interaction. For instance, although the woman is not central in the studies investigating the midwives' experiences and learning, her behaviour and personal determinants are factors that could affect the shared environment and behaviour of the midwives. Similarly, when the midwives enjoy working together, this could have an impact on their behaviour and the environment, and in turn possibly influence the woman's experience of the birth and the intervention. This could be seen in Paper III, for example, where an association was found between the primary midwife being positive towards having a second midwife and a positive experience being reported by the woman.

Also, in Paper I it could be seen that the role of the second midwife, whether supportive role, or passive, has an impact on the birthing situation. If the latter was perceived as the second midwife being superfluous or even disruptive by the primary midwife or the woman, this could affect their behaviour, the birthing atmosphere, and eventually their reported experiences.

Consequently, the subject matters investigated in the studies are all interconnected by the complex interactions between the environment, the personal and behavioural determinants of the midwives, and the woman involved. Hence, an extended and modified version of Albert Bandura's model of triadic reciprocal causation[70] was created to depict and understand how the influence between each actor's personal

and behavioural determinants impacts one another and the environment (Figure 8). By synthesising the findings according to this model, the four papers were linked together to form a cohesive whole and to take a step towards presenting a more holistic picture.

*Synthesis of experiences from CMA using a modified model of triadic reciprocal causation*

The modified model describes interactions between the primary midwife, the second midwife, the woman, and their shared birthing environment when practicing CMA. Each of the three actors has personal determinants and behavioural determinants, and the triadic reciprocal interplay between them and the environment is depicted with arrows. The interactions between the primary midwife, second midwife, and the woman are illustrated using the bold arrows (Figure 8). Examples of personal, behavioural, and environmental determinants have been extracted from the four papers and are presented in the corresponding boxes.

*The environment*

As described by Bandura, environmental determinants can be imposed, selected, or created[70] and the midwives and the woman can experience different lived environments despite physically sharing the same one. To keep the model reasonably simple, the environment has been represented as a shared environment, although in reality it could have been understood as multiple environments, experienced individually by each actor. The environment can be shaped by factors that depend on each study site, such as culture, norms, and values in the organisation, workload, relationships (between the midwives, as well as between the midwives and the woman) and the birth atmosphere. From the perspective of the primary and second midwife, they could experience an environment that is sometimes partly imposed, such as when they engage in CMA because of the trial. It could also be selected, when they have chosen to be the second midwife or when they, in the role as primary midwife, have chosen the second midwife according to their own preferences. When the intervention was planned in advance, it could be an example of participating in creating the environment.

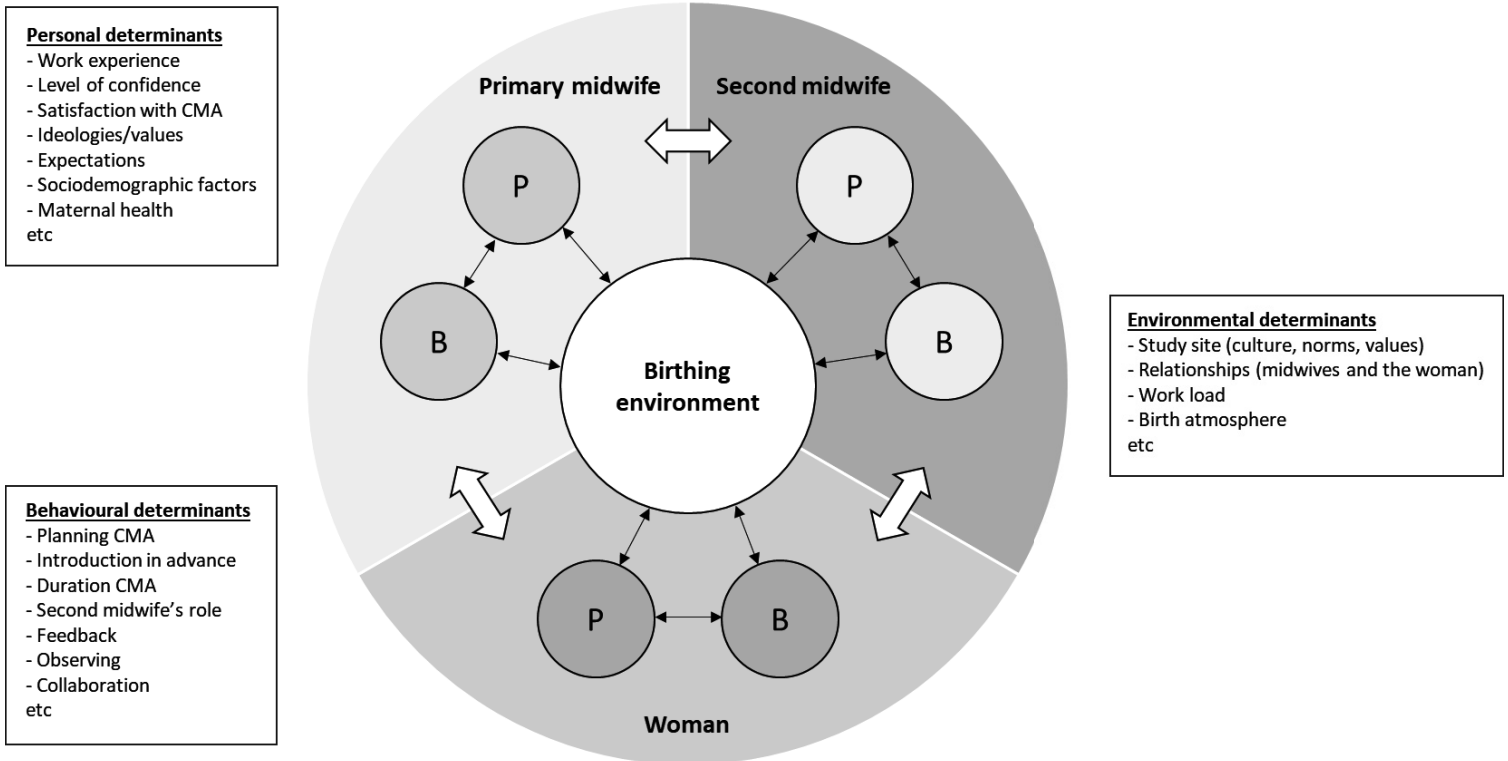



**Figure 8.** An adapted Bandura's triadic reciprocal causation model depicting the interplay between the primary midwife, the second midwife, and the woman when practicing CMA.

*Personal determinants*

Examples of intrapersonal determinants according to SCT are innate characteristics, aspirations, values, and competences.[70] Accordingly, intrapersonal determinants for the primary and second midwife could be length of work experience, expectations, ideologies, and values. Furthermore, it could include satisfaction of having a colleague present, and the appreciation of being the second midwife during a specific birth. The woman's personal determinants include socioeconomic background, such as educational attainment, or experiencing FOB. It may also include expectations (forethoughts) linked to the purpose of the intervention being to prevent SPT, and correspondingly, the woman contemplating (self-reflecting), which could shape experiences of having an additional midwife present during the sensitive second stage of labour.

*Behavioural determinants*

Behavioural determinants are factors such as whether the second midwife provided active support, introduced herself in advance, performed manual perineal protection, the duration of CMA, the planning of the intervention, reciprocal feedback, and how the second midwife balanced between different roles. Also, the midwives' and woman's behaviour may include reactions in the form of facial expressions, body language, verbal reactions, tone of voice, physical actions, and more.

*The time perspective*

In the synthesis, it should also be noted that in some cases, time elapses between events, which can affect the various determinants. This means that the reciprocal interplay could occur instantaneously or after a delay.[70] Thus, depending on the situation, the causal influence of any of the three determinants could have an impact during the intervention, but also some time later, such as at future births. An example would be the second midwife interfering with and correcting an action by the primary midwife (corrective modelling) leading to an immediate change of behaviour. However, the resulting adoption of what has been observed by a colleague might also change behaviour at a future birth. Similarly, a reaction by the woman in a certain situation could affect the midwife's course of action at a subsequent birth. Therefore, the model does not imply that all interactions occur simultaneously at each birth when practising CMA.

# 8. Discussion

## Methodological considerations

### Trustworthiness

This thesis uses data collected from a randomised controlled trial, from focus group interviews, and from a one-month postpartum follow-up questionnaire. During the data collection process, I had the privilege of being responsible for one of the study sites in the *Oneplus* trial. This gave me numerous opportunities for discussions with and to get input from colleagues, which I believe positively contributed to the four papers included in this thesis. Regardless of methods used, each has its strengths and limitations, and several criteria are used to evaluate trustworthiness in both quantitative and qualitative research.[138] For qualitative research, the gold standard criteria specified by Lincoln and Guba[155] to attain trustworthiness are *credibility, dependability, confirmability,* and *transferability.* The corresponding criteria for quantitative research are *internal validity, reliability, objectivity,* and *external validity.*[138] The trustworthiness of the methods used in the four papers included in this thesis will be reflected on in the following sections.

### Qualitative focus group study – Paper I

We decided to use focus group interviews to collect qualitative data as they illuminate the individual's opinions, beliefs, feelings, and experiences in a manner not easily achieved through other interview forms. [130] It is a data collection method that leverages social interaction among participants and thus distinguishes itself from other methods such as interviews and surveys.[132] Focus group interviews are especially valuable when there is no or limited previous research on a topic, as they allow for the gathering of a wide range of perspectives and understanding of a new field.[156,130]

To increase *credibility,* i.e. the ability to capture the participants' diverse realities,[138] we aimed to have 6-10 midwives in each focus group. The size of a focus group is important and generally 6-10 participants is considered to be ideal. Groups with too many participants, may hinder some individuals from expressing their views, resulting in an incomplete representation of their perspective. Conversely, a group with too few participants may lack diversity in perspective and viewpoints resulting

in a less stimulating environment, with limited richness and depth in the discussion.[130] We further attempted to keep an open and positive group dynamic during the interviews to encourage the midwives to share their experiences. We, as researchers, alternated between being moderators and assistant moderators when conducting the focus groups interviews. A thematic guide was used for the discussions, and although it was used with flexibility, it helped to keep the discussions on track to meet the aim of the study throughout the interviews and ensure the *dependability,* i.e. stability, of data across different time points and circumstances.[157]

Since all of the researchers and assistant moderators that conducted the focus group interviews were registered midwives working in some of the clinics, we sought to be reflexive to not introduce bias. *Reflexivity* refers to the importance of a researcher critically reflecting on their own role in the research process by maintaining a constant awareness and regarding their own values and how these may impact data collection, analysis, and interpretation.[157] This is closely connected to *confirmability,* which refers to neutrality, i.e. that the results are not biased or influenced by personal inclinations.[138] In qualitative research, however, subjectivity is seen as an integral part of the analysis process and a resource rather than a concern, as long as the researcher is reflexive.[132] What distinguishes reflexive TA from many other qualitative approaches is that a coding agreement between different coders is not sought. This is because the coding process is regarded as subjective rather than objective. The assumption is that findings in data are created by the researcher and there is no single truth, rather than that the findings already exist (and is there to be found).[143] Hence, the coding process in this study was performed by the first author.

The results also need to be considered in terms of *transferability*, which refers to the extent to which qualitative findings are applicable in other settings. It is the researcher's responsibility to provide *thick descriptions* so that the reader can decide whether they are applicable to their own, individual context. Thus, it is not the researcher who makes this decision, but the reader.[138,157] In this thesis, I sought to provide a more comprehensive context in the background section to enhance the assessment of transferability. However, a limitation of this study is that midwives from one of the clinics in the *Oneplus* trial did not participate in the focus group interviews due to practical reasons, resulting in exclusion of stories from midwives in one of the five obstetric units.

Braun and Clarke's version of TA is characterised by its theoretical flexibility, where the researcher needs to actively make decisions regarding what theoretical assumptions are made throughout the research process.[141-144] To increase the quality of the study, the authors followed a criteria checklist for reflexive thematic analysis developed by Braun and Clarke[141].

## Observational design – a statistical overview

The data used in the quantitative studies originated from an M-RCT. We used an observational design since the overall aim was to evaluate perspectives from both midwives and women. This type of design allows a wide range of exposures to be analysed in relation to the outcomes. However, the major limitation of an observational design is the researcher's inability to have full control of interfering factors.[158] The following sections will provide a summary of these factors, followed by a discussion of how this limitation was addressed in Papers II-IV.

*Validity* is defined as the absence of *bias, confounding,* and *random error*. Random error refers to chance variations in measurements or observations that can arise from natural variation, measurement imprecision, or other uncontrollable factors.[158] *Reliability* denotes the extent to which a measurement is unaffected by measurement error, and more broadly, it encompasses the consistency of scores across repeated measurements for individuals who have remained unchanged.[157] *Confounding* can be described as a combination of effects between an exposure, outcome, and a third confounding variable. A confounder is a variable that is associated with both the exposure and the outcome, and importantly, it is not an intermediate step in the causal pathway between the exposure and outcome. In that case it would instead be a *mediator*. Confounders can distort the true association between exposure and outcome by either minimising or exaggerating it. Confounders can be controlled for in the design stage and/or in the analysis stage.[158] Mediators should not be adjusted for.

Both bias and confounding lead to false associations between exposure and outcome. The difference is that confounding reflects the presence of extraneous factors that can distort the association between an exposure and an outcome, whereas bias is introduced by the investigator in the study design or when conducting analyses. However, both are considered *systematic errors* because they arise from an identifiable or known process or factors and are not random. In addition, they cannot be reduced by increased sample size.[158]

A way of minimising *random error,* i.e. the probability that the result is caused by random and unpredictable factors, is to increase the sample size and even out variability within the data. To quantify random errors, estimation of the width of the confidence interval (CI) can be used, where a broader CI indicates a larger amount of random error and a small sample size, and vice versa.[157]

Validity can further be divided into *internal validity* and *external validity.* Internal validity pertains to the extent to which data capture what the researcher aimed to study and that accurate conclusions can be drawn from it, free from design-related errors, various types of confounding factors, or other variables that can affect the result. It is also about *objectivity*, i.e. to what extent the results are biased by the researchers' personal values or beliefs.[157] A researcher is situated within a specific social and cultural context that serves as a point of departure for the research. Hence, the knowledge gained by the research is not complete, but rather a part of the

truth.[159] External validity concerns how applicable the results are to other contexts and subjects. If, for instance, there is selection bias or a substantial proportion of data are lost, the results may be distorted and fail to represent the true population.[160]

## Quantitative studies - Papers II-IV

To ensure reliable measurements, it is essential that both random measurement errors and systematic biases are minimised. How this was addressed in Papers II-IV will be reflected on below, where study design, data collection, data management, and analysis are covered. A strength is the multi-centre approach in the *Oneplus* trial, where all data were prospectively collected with a high inclusion rate of 63%, and obstetric units of different sizes located in different regions were included.[6] Thereby, the sample represents both diverse characteristics of obstetric units and different sociodemographic characteristics among women giving birth. This enhances the external validity, i.e. the ability to generalise the findings to units with similar birth systems and contexts.

The educational sessions held with midwives at each study site were conducted to reduce bias and enhance both validity and reliability. The educational sessions provided essential information regarding study design, the importance of reaching a high inclusion rate, and how to properly complete the CRFs. In addition, the responsible research midwives at each study site encouraged and instructed the midwives and kept track on the CRFs. To ensure reliable answers, the primary and second midwives used separate CRFs that were deposited in a locked letter box once completed.[161] Regarding the data collection for the one-month postpartum follow-up questionnaire, we provided the same information and mailings across all study sites to maximise the probability of reaching women from diverse groups and to achieve consistency.[135]

Data used in Papers II-IV consisted of CRFs, data from local databases (used in Papers II and IV), and a follow-up questionnaire completed by women one month postpartum (used in Paper III). This combination of data from different sources enabled us to examine associations between various factors and their impact on the experiences of midwives and women, thereby providing a more comprehensive understanding of the CMA intervention.

That we used study specific CRFs and a one-month postpartum follow-up questionnaire developed by the research team presents both advantages and disadvantages. A disadvantage is that neither the CRFs, nor the one-month postpartum follow-up questionnaire had been previously used in research. The selection and composition of items when constructing new forms can affect validity and reliability.[162] On the other hand, the experience and competence of the researchers could contribute to valuable new knowledge being generated, particularly since CMA has not been previously studied. However, to enhance validity, the items in the CRFs were tested for face validity[163] with midwives of

various lengths of work experience. The researchers assessed the questions based on their content, how participants perceived them, and coverage of the intervention. Adjustments were made as needed after each evaluation. Similarly, the one-month follow-up questionnaire was also tested for face validity with women who had given birth vaginally for the first time.

The one-month postpartum questionnaire was only administered in Swedish and English, which resulted in the exclusion of women who were not proficient in these languages. Hence, the potential for generalisation beyond English and Swedish speakers may be constrained. Apart from that, we made concerted efforts to enhance participation by sending out repeated reminders and communicating through text messages and e-mails.[135] As a result, we achieved a high response rate of nearly 80%, making it likely that we captured individuals who otherwise might not have responded to the questionnaire. This not only increased the sample size but also minimised the risk for bias and random errors.

Other factors that can introduce bias to the results include the choice of when to approach the women. When measuring overall birth experiences there is no consensus on the optimal point in time.[164-166] Moreover, birth experiences change over time.[165,167] We chose to send out the first questionnaire one month postpartum, with the reason for sending it so early being to increase the likelihood of women recalling the CMA intervention. Previous research has demonstrated that women's childbirth experiences can be influenced by the timing of assessment, with earlier measurements yielding more positive outcomes reflecting a sense of relief that the birth is over.[164,168-170] The majority of woman responded within two months, but it is not possible to draw any conclusions regarding whether the timing was optimal or not. Notably, we found that approximately 10% of women who had in fact received the CMA intervention responded that they had not received it or could not remember receiving it, which must be considered a limitation. In our responses regarding women's experience of the intervention, it must also be considered that the women who participated in the study were informed that the aim of the intervention was to prevent SPT, which may have contributed towards their positive outlook on it.

The items concerning women's experiences of the intervention were rated on a five-point Likert scale, where the alternative *unsure* was included. In the CRFs, on the other hand, the alternatives were rated on a four-point Likert scale, without any neutral alternative. However, it is widely debated whether it is an advantage or disadvantage to include a neutral alternative. It has been argued that some participants may choose *unsure* as a quick and easy answer without thinking about the question, which can reduce the validity and reliability of the survey. At the same time, if you don't have the neutral alternative it can also force an answer that doesn't match their true perception, and in turn result in less reliable answers.[135]

The high data completeness of data on midwives' experiences and the high response rate on the one-month follow-up questionnaire indicate that the items posed were important to both the midwives and the women. Regarding the items concerning the primary midwives' experiences, we can see in retrospect that more positive questions could have been included to provide a more detailed and nuanced picture of their experiences. Most of the items addressed the more negative aspects, which could have been due to the researchers' pre-understanding[171] when designing the CRFs. However, since we also sought to get a broad picture of how the CMA intervention was experienced by women and midwives, the items included both in the CRF and the one-month follow-up questionnaire seemed to succeed in providing a clear overall picture of the magnitude of their experiences.

In Papers II-IV, we performed both descriptive and inferential statistics. Since experiences of CMA have not previously been studied, we decided on both outcomes and exposures based on clinical reasoning. The choice of exposures and outcomes also involved taking into consideration the number of observations. To adjust for confounding, we performed multivariable logistic regression analyses and potential confounders that were used for each outcome and exposure were selected based on DAGs[147] and clinical reasoning. The use of DAGs helped us to visualise and thereby identify sufficient adjustment sets, to minimise bias when estimating the causal effect of the exposures and outcomes.[147] This is because, if not carefully considered, the adjustment for confounders can introduce bias rather than alleviating it.[172] The selection of confounders also involved taking the number of observations into consideration to avoid running the risk of overfitting.[173] Nevertheless, despite that efforts have been made, there is always a risk for residual confounding being present due to a too broad categorisation of confounders, measurement error during data collection, or simply the absence of specific confounders as variables in the existing data set.[158]

To run logistic regression, we dichotomised the outcome variables. When doing this there is a risk of information getting lost.[174] Moreover, since the researcher makes choices based on assumptions and thereby decides the cut off values, there is also a risk of observations becoming misclassified. However, all methods have their pros and cons. We regarded logistic regression to be the most accurate method since it allowed us to adjust for confounding. In Papers II and III, based on previous research,[145,146] we dichotomised the highest value (*Strongly agree*) against all other alternatives based on the assumption that the remaining alternatives suggested room for improvement. In Paper IV, we dichotomised based on the logic that any degree of agreement (*Completely agree, Mostly agree* and *Partially disagree*) meant that CMA had contributed with new learning. Especially since the second midwife's learning outcome only had the two alternatives *Yes* or *No*.

The combination of both qualitative and quantitative methods probably contributed to both reduced bias[175] and a deeper understanding of the midwives' experiences. The use of focus group interviews provided insights that would not have been

attainable through quantitative methods alone. When the respondents were given the opportunity to problematise regarding CMA, many more viewpoints emerged compared with when the provided response options were constrained, such as in the CRFs. Hence, the qualitative study provided a broader understanding of the experiences of the CMA intervention, whereas the quantitative research allowed for quantifying its prevalence. Moreover, the synthesis of the findings from both qualitative and quantitative approaches in the four papers within the SCT framework aimed to provide a theoretical understanding of midwives' and women's experiences of CMA.

# General discussion

The findings from this thesis form a basis for an improved understanding of midwives' and women's experiences of collegial midwifery assistance, with the purpose of preventing severe perineal trauma during the active second stage of labour. It also delves into the professional learning embedded within the clinical practice. This thesis makes three significant contributions to the field of midwifery.

*Firstly*, the thesis shows that CMA was overall a well-accepted practice for both women and midwives with a low frequency of unintended side effects being reported. A noteworthy finding was that higher levels of satisfaction with CMA were reported among novice midwives who go through a susceptible period in the start of their career. In addition, women who can be considered to be from more vulnerable groups, such as those with lower educational attainment, who reported FOB during pregnancy, and who did not have Swedish as their mother tongue, reported higher satisfaction with CMA.

*Secondly*, midwives' experiences were multifaceted and influenced by factors that were both modifiable and non-modifiable, such as the culture of the obstetric unit, midwives' individual views on childbirth, prevailing norms, and personal relationships. Several intervention-related factors were associated with the experiences of both women and midwives, where a duration of CMA of 15 minutes or more was a key-factor throughout the thesis.

*Finally*, we found that the CMA intervention provided advantages in addition to preventing SPT, which could benefit both midwives and women. This was in terms of valuable collegial support, as we showed that a substantial proportion of the primary midwives expressed positivity when having a colleague present and that it could contribute towards improved confidence. Similarly, a significant proportion of the women experienced an enhanced feeling of safety and expressed a preference for CMA in the event of a subsequent birth. Additionally, CMA provided a platform for embedded learning that benefited the midwives across all groups of work experience, whether in the role of primary or second midwife.

## CMA from the midwives' perspectives

The study revealed that the majority of primary midwives felt confident and positive towards having a second midwife present in the birthing room during the active second stage of labour. This association was particularly prominent among the least experienced midwives (with less than two years work experience) compared to their most experienced counterparts. These findings are in accordance with previous research which has demonstrated that support from more experienced colleagues can contribute towards early career midwives building and maintaining resilience during their vulnerable initial period.[51] This is significant since it has previously been claimed that organisations should seek to enhance midwives' confidence.[71] Being confident is linked to *self-efficacy,*[70] i.e. in this case the midwife's confidence in being able to cope with an action in a particular situation, which is a vital resilient response for midwives to address challenges at work.[51] Hence, CMA may help to empower early career midwives when they face their most critical and vulnerable period,[51] in particular when they work in the stressful and strained landscape that currently characterises Swedish intrapartum care.[10]

The active second stage of labour can be viewed as the momentous culmination of the birth and also the most critical phase of labour, carrying significance for the birthing woman, the child, and the midwife.[7,99] It is reasonable to assume that this phase is even more of a challenge for early career midwives compared to experienced midwives, especially given less experienced midwives' higher rates of SPT.[176] Midwifery care during the active second stage of labour entails numerous components and it can be challenging to meet all expectations from the woman. Considering that the purpose with the CMA intervention was to reduce SPT,[6] this may have had an impact on the women's expectations as well. Previous research has shown that SPT can elicit feelings of guilt, failure, and shame in midwives towards the birthing woman, as well as their colleagues.[177,178] There is further evidence to suggest that using a recommended preventive method according to guidelines may alleviate some of the responsibility if a severe tear were to occur.[65] Since making appropriate decisions during the second stage is essential for quality of care and the safety of the woman and baby,[101] having a colleague present for shared decision-making may be of help to ensure a slow and controlled birth while simultaneously ensuring the well-being of the baby.[99] This was supported in our data as help with the interpretation of CTG readings was one of the most requested types of assistance among primary midwives. The collaborative work of midwives and women when practicing CMA can be attributed to the concept *collective agency* in SCT, which highlights the significance of combined competences and contributions of individuals to achieve a common goal.[129]

### *The significance of the second midwife's role*

We observed that the experiences of both the primary and second midwives of CMA depended on various factors. These factors included the duration of CMA, role of

the second midwife, the ability to plan the intervention, the culture on the birth unit, level of work experience, personal traits of the midwives, their views on the professional role, and collaboration. Our investigation revealed that the second midwife could have different roles in the birthing room depending on how both the primary and second midwife perceived the situation. This can be related to SCT,[70] where it is posited that an individual's environment can be *imposed*, *selected,* or *created*. Our results showed that the midwives perceived and expected the intervention to be largely task oriented. Mere presence by the second midwife could result in a perceived *superfluous* role, making midwives voice a desire for specific guidelines regarding the tasks assigned to the second midwife. Moreover, when the second midwife provided some kind of active support, the primary midwife felt more confident and positive towards the CMA intervention. Similarly, women felt safer when active support was provided by the second midwife. These findings may be partly explained by the fact that the purpose with the intervention was to prevent SPT and thereby both the midwives and women expected the second midwife to take some kind of active role. That no associations were identified between manual perineal protection performed by the second midwife and the primary midwife's level of confidence may indicate that midwives have adopted the view that preventive methods are multifactorial, rather than merely about specific handgrips.[3,4]

*CMA and midwives' autonomy*

According to SCT,[70] the reciprocal relationship between environmental and intrapersonal determinants means that individuals can influence their environment even without doing or saying anything actively. Correspondingly, for senior midwives who may be used to working autonomously, we found that the intervention could challenge their professional role and evoke a sense of lack of control, and hence, the imposed environment may lead to a compromised autonomy.

Autonomy can be linked to perceived self-efficacy,[125] which is a central aspect of agency in SCT. One example of self-efficacy is the confidence of the primary and second midwife in their capacity or competence in managing the active second stage of labour. Another example is the second midwife's ability to provide the expected support. Depending on the individual midwife's work experience and capacity to perform, or take responsibility for, a certain task, they might prefer to perform the task individually (individual agency). But on the other hand, if the midwife does not have the capacity to complete the task, CMA provides access to a second midwife who might have the expertise and can act on the primary midwife's behalf (proxy-agency) to reach the desired outcome. In other instances, the midwives could be mutually dependent and benefit from their combined efforts during CMA in collaboration with the woman (collective agency).

While the desire for professional autonomy may be contingent on the capacity of individual midwives, external factors have also been found to impact their sense of

independence. For instance, it has previously been shown that a workplace culture where midwives feel monitored or watched can diminish autonomy and confidence in their work.[179] Additionally, in a recent evaluation of an implemented care bundle in Australia, it was shown that the bundle compromised the midwives' autonomy. When they felt that they were being monitored and forced to follow a clinical practice, they felt restricted in their provision of women-centred care. The major reason that the midwives in the study did not embrace the practice was that some parts in the care bundle were not supported by evidence.[65] This stresses the necessity of ensuring practices, such as CMA, are evidence based. It is known that once evidence-based practices are implemented in daily work, they become habitual, as individuals gradually adopt them.[180]

*To match ideologies*

Our data suggest that the midwives' experiences of CMA were dependent on *who* they collaborated with and that the relationships between the midwives were important. Consequently, in cases when midwives experienced synchronisation and collaboration they felt empowered to address challenges collectively, fostering normal, physiological births. Nonetheless, some junior midwives found it difficult to interfere with senior colleagues' work, which is in accordance with previous evidence.[181] This could partly be due to a lack of confidence in their capabilities and skills, including decision-making skills, as many junior midwives doubt themselves due to feeling inexperienced compared to their more senior colleagues.[182] The result could be that junior midwives feel compelled to conform to care that actually conflicts with their ideologies.[55] However, it has also been shown that situations where opinions differ can further arise when high-level evidence regarding optimal practices is lacking,[7] which stresses the importance of implementing evidence-based practices in intrapartum care.

## CMA and professional learning

Another noteworthy finding in this thesis was that CMA provided midwives with learning opportunities. SCT postulates that people learn through *observation* and *modelling* of behaviour in a social context, where a reciprocal interaction between the individual, the environment, and the behaviour occurs.[70] Taking this theoretical underpinning into account, our results imply that CMA offers opportunities for midwives to acquire competence by observing others' actions and the consequences of these actions in clinical practice.[183] This is significant since exclusively depending on personal experiences extends the duration required to acquire knowledge and demands a lengthier timeframe,[124] especially within intrapartum care as it takes time to gain experience and knowledge.[17,184] The significance of learning by observing others in the context of CMA is further underscored by earlier research, revealing that early-career midwives find the transition into the profession challenging, partly due to a perceived gap between the expected level of knowledge

and what has been offered in education.[19,20,21] Moreover, skill acquisition is, according to SCT, a prerequisite for effective agency, i.e. the individual's ability to intentionally affect circumstances and one's own functioning. These agentic capabilities develop when people interact with and are affected by their surrounding environment.[70]

*The complexity of learning midwifery skills during the active second stage of labour*

Learning through practicing CMA occurs during the active second stage of labour, which is commonly perceived as the most intensive and critical phase of childbirth.[99,7] It has previously been reported by student midwives and preceptors that this is also the most demanding period of childbirth to both learn and teach. This is due to the circumstances during this stage, which require increased support for the woman, as well as the application of perineal protection, a skill that embodies a form of craftsmanship that needs to evolve gradually over time. Reaching the necessary level of skill acquisition requires a fine-tuned aptitude to identify and address various conditions in diverse circumstances.[185] This aligns with the idea that midwifery practice involves three different forms of knowledge; *episteme* which is theoretical knowledge gained from research, *techne* entailing various practical activities performed by midwives, and *phronesis* encompassing the art and wisdom of midwifery on which knowledge is founded.[33]

Even though, professional learning was more prevalent among the early career midwives (with less than two years of work experience), it was observed across all groups of work experience. Through subgroup analysis, based on work experience, we identified that associations between the experienced level of learning and factors such as work experience of the colleague, reciprocal feedback, and duration of the intervention, varied depending on the midwives' own level of work experience. It was also different when the midwife acted as the primary midwife compared to acting as the second midwife. This is not surprising since observational learning according to SCT[124] states that to be able to reproduce what has been observed, the individual needs not only to attend and retain, but also to be motivated to learn through observation, which is dependent on a myriad of complex cognitive processes and feelings that guide action.

Learning is further determined by each individual's prior knowledge within the field. It is hierarchically structured, meaning that that basic knowledge must be mastered first before more advanced knowledge can be obtained.[124] This can explain why the midwives who were less experienced reported learning more frequently, as they needed to grasp basic skills. Senior midwives on the other hand may gradually assimilate other types of knowledge, such as changes in practice, over time. The variations we observed in terms of work experience could also be explained by the social process innate in knowledge acquisition.[186] This involves the creation of new

relationships and adaptation to new environments,[187] which may occur more frequently in the early stages of one's career. It comprises building relationships not only between colleagues but also with the woman and her partner.[188] To elaborate the line of reasoning from SCT, one could draw on Schön's[189,190] concept of reflection *in action* and *on action.* The former implies that the individual thinks and reflects while performing the task, while the latter occurs after completing actions, leading to higher levels of skill and expertise. Since what Schön refers to as *knowing-in-practice*[189,190] develops over time and becomes increasingly tacit, spontaneous, and automatic, it may also help explain our findings, particularly the association between learning and increased duration of the intervention that was particularly prominent among the least experienced primary midwives. This is in line with the *time on task* hypothesis, that posits that the amount of time invested in a task is proportional to the individual's learning outcome.[191]

*The process of learning when practicing CMA*

According to SCT, transforming theory into practical action is rarely done without error at initial attempts, and requires correction and feedback. Hence, feedback is important to be able to correct when a task has been executed incorrectly and improves learning. Corrective modelling, where skilled practitioners demonstrate an identified challenging task, has also been shown to improve learning according to SCT.[124] This can explain why feedback was more important in the role as primary midwife. It is well recognised that feedback is a vital part of learning,[192,193] and its effectiveness is dependent on its nature (positive or negative) and timing.[193] We could see that midwives found it challenging to provide feedback when they lacked resources and tools, which is in accordance with previous findings.[194] The idea that receiving feedback can be perceived as threatening may contribute to the difficulty in delivering it,[195] and the way in which it is delivered significantly influences how it is perceived.[195,196]

When discussing learning during the CMA intervention, it is relevant to consider the potential risk of the learnt habits or techniques being inaccurate. On the other hand, it is plausible that observing only a few midwives demonstrating midwifery care in a certain way, such as during clinical training,[184] would be more likely to result in erroneous conducted behaviours being learned, compared to witnessing numerous midwives, which is the case when practicing CMA. Another thing to consider is that learning by observing a colleague is influenced by feelings, and there is not always a desire or inclination to use the knowledge attained. For instance, according to the concept *vicarious reinforcement*, when one observes an action performed by another person that results in negative consequences, learning is seldom applied.[70] Conversely, when the midwife sees a positive outcome and satisfaction of given care, the action observed would likely be more commonly brought into later use.

## CMA from the perspectives of women

It is widely agreed that midwives strive to ensure a safe and calm environment for women giving birth.[94,179] This approach aims to minimise stress and foster physiological birth.[97] Moreover, the relationship between the woman and the midwife is crucial for women's birth experiences.[146,197-199] Since the intervention entailed that an additional midwife entered the birthing room during a sensitive phase of the birth process, it can be assumed that it could influence the women's experiences of CMA and underscores the importance of evaluating the impact of this on the women's perspective as well.

We found that the CMA intervention was a well-received practice among women, and unintended side effects such as the woman feeling stressed or perceiving that there were too many people in the birthing room were rarely reported. This is of significance, given the midwives' initial concerns at the start of the trial about these possibilities. A notable finding was that women who did not have Swedish as their mother tongue, had lower educational attainment, or experienced FOB during their pregnancy were more satisfied with CMA than other women. Although certain contradictions have been identified in previous research regarding level of education and birth experiences,[87,200] our findings are in line with a recent report showing that both women with a low level of education and foreign-born women were less likely to experience negative experiences in healthcare.[201] The reason for the relatively lower satisfaction levels among women with higher educational attainment is unclear, but one possible explanation may be attributed to a more critical stance to the care they receive due to increased expectations and a more pronounced understanding of their rights.[201] The rationale behind women who did not have Swedish as their mother tongue being more satisfied with CMA compared to native Swedish-speaking women is yet to be known. It may, at least in part, be due to conventional practices in some countries involving more than one midwife during birth,[6] as the composition of personnel varies depending on the country.[26]

Our findings revealed that women with FOB were more inclined to opt for CMA in subsequent births despite not reporting an increased sense of safety. This is an interesting point considering fear of the unknown, uncertainty about emotionally reactions, and the inability to maintain control can have an impact on experiences and satisfaction levels of women with FOB.[202] Our findings are important in light of women with FOB more commonly having previously experienced negative encounters in terms of disrespectful care, having been less involved in given care, having reported more lack of control, and poorer support compared to other women,[201,203] and have been shown to be at risk of less positive birth experiences.[204] However, women with FOB frequently articulate concerns about suffering from SPT in a manner that can influence their decisions regarding mode of birth.[205] Given that the intended purpose of CMA was to prevent SPT, this aspect could contribute to the explanation of our findings.

According to critical realism,[126,130,131] there are certain things midwives experience and see in the birthing room. One example is how the woman appears to manage the second stage of labour. The actual situation can be explained by many complex factors that we cannot observe and what is truly happening is not always known by the midwife nor the woman herself. Furthermore, women's experiences are determined not only by the quality of care provided, but also by their history and how they are filtered through each woman's lens, where cultural, emotional, and psychological factors may play a role in shaping perceptions.[86,204]

It should be emphasised that we evaluated first-time mothers and consequently they lack a previous reference point in which to make comparison with. Due to having no previous experience of giving birth, it is possible that this could have resulted in an overstated satisfaction with the care they received.[90] Despite this, we could show that some factors were associated with higher levels of satisfaction with CMA such as the duration of the intervention, the second midwife introducing herself to the woman in advance, and when the primary midwife felt positive about having a colleague present during birth. The reasons for these are unclear, but it is possible that the introduction contributed to heightening the importance of the intervention, especially since earlier evidence suggests that the establishment of new relationships during the intense active second stage of labour can be challenging.[8] Both the duration of the intervention and the introductions in advance share the common factor of establishing relationships. Previous research has demonstrated that the initial meeting between the midwife and the woman is crucial in the relationship-building process during birth, and that when the midwife succeeds in establishing contact with the woman, a reciprocal relationship begins to unfold.[206,207]

## CMA from a broader perspective

In order to achieve a deeper understanding of the thesis findings, it is relevant to discuss the research also from a broader perspective. There is no doubt that Swedish intrapartum care is of a high standard and that serious adverse events for mothers and babies are rare compared to global figures.[28,29] However, it is crucial that healthcare quality is not measured solely on survival outcomes, as highlighted in the concepts *Survive*, *Thrive*, *Transform* established by UNAIDS.[208] These concepts are related to the *Sustainable Development Goals* (SDGs) wherein midwives play an important role.[209] In this context, research shedding light on women's perspectives is very important, as it has traditionally received less attention.[210] It holds a relevance to take a move forward in the direction of achieving equality and the empowerment of women which is part of the SDGs (goal 5), as well as a step towards improved health and wellbeing (goal 3).[209]

The results gained from this thesis provide new knowledge regarding the perspectives of midwives and women, which is important and can be used to guide

and optimise practice according to their perspectives. It has previously been shown that contextual factors such as acceptability and professional adoption need to be addressed when implementing new clinical practices as these factors can influence clinical outcomes.[211] This consideration becomes particularly important when given the limited number of midwives currently available in the Swedish birth units,[11,34] the high workload, and the busy work environment.[10]

From a sustainability perspective, it is also essential to ensure midwives' job satisfaction to reduce turnover rates in the profession and to retain midwives within intrapartum care. Early-career midwives tend to leave their positions more frequently than more experienced midwives due to challenging working conditions,[13] and CMA may serve as a tool to empower midwives during this particularly vulnerable period. A step towards this could be that we found CMA to not only improve early career midwives' confidence in practice and provide valuable support, but it also offered continuous learning opportunities for both junior and senior midwives. This is important as Continuing Professional Development (CPD) is required to safeguard high-quality maternal care[42] and enable midwives to thrive, in accordance with the SDG 4, which states the need for education and lifelong learning for midwives.[209]

In order to achieve sustainability and resilience among midwives, it has previously been shown that the reciprocal relationship between the work environment and work performance, and wellbeing must be taken into account.[188] By applying SCT theory in the synthesis of the findings, we have taken the individuals (midwives and women), the environment, and behaviour determinants into consideration to contribute with a deeper understanding of CMA.

# 9. Conclusions

In conclusion, our findings indicate that the CMA intervention was a well-accepted clinical practice among both midwives and women. It particularly benefitted early-career midwives, who go through a vulnerable period in the transition from student to registered midwife, and women as they transition from pregnancy to motherhood. CMA also provided valuable support and professional learning, indicating that it has the potential to contribute beyond solely reducing the incidence rate of SPT. However, it is important to keep in mind the complex interplay between the situation, environment, both midwives and the woman, that shape their experiences of CMA. By taking this into account alongside the results gained from the four papers included in the thesis, one can harness the benefits and mitigate the potential unintended consequences, in the pursuit in optimising the utilisation of the CMA intervention.

# 10. Clinical implications

The impetus to the *Oneplus* trial was that approximately 50% of the Swedish birth units used CMA without any scientific evidence of its effectiveness. The primary outcome in the *Oneplus* trial showed that CMA is an effective method for reducing SPT, and the study was published in *The Lancet* in March 2022. The four sub-studies included in this thesis contribute to expanding our knowledge regarding midwives' and women's experiences of the practice. Based on the findings in the *Oneplus* trial, the Swedish guidelines (LöF) now recommend CMA to reduce SPT. Moreover, an international expert review recently mentioned the CMA intervention in the American Journal of Obstetrics and Gynaecology[212]. Our research group has organised workshops wherein colleagues on the birth units Skåne University Hospital actively contributed with their inputs to facilitate and optimise the implementation. I have in collaboration with research colleagues developed a local guideline that incorporates findings from my four papers. The maternity health care staff has thus been involved in the entire research process, which also provides implementation gains. Results from the studies have been continuously shared at national and international conferences.

# 11. Future perspectives

- To provide a deeper understanding of women's experiences of CMA, in-depth interviews could provide more details and insights, that are not possible to attain from quantitative research.
- I would suggest a longitudinal follow-up study that investigates midwives' learning to evaluate if learning embedded in the CMA intervention changes over time. Moreover, adding more details about participating midwives and learning outcomes could enable further types of analyses and lead to more comprehensive conclusions.
- It would be interesting to see more studies that do not only evaluate collegial professional learning during the active second stage of labour, but also during the whole labour process, in relation to factors such as amount of work experience, reflection, and feedback.
- There is a need for an economic evaluation of the CMA intervention. During the *Oneplus* trial it was implemented with existing resources, but findings suggest that certain aspects, for example the duration of the intervention, might require additional resources.

# 12. Acknowledgements

I am deeply grateful for the contributions of many individuals to this doctoral thesis project; their unwavering support and guidance have been invaluable throughout the entire course of the project.

First, I want to thank all the midwives and women who participated in the *Oneplus* trial for your efforts, commitment, and willingness to share. Without your engagement, this thesis would not have been possible.

To *Christine Rubertsson*, my main supervisor, I want to express my heartfelt gratitude for the amazing opportunities you have given me. Our brief initial conversation in the lunchroom at the Malmö birth unit set me on this path. Your exceptional expertise in the field and your confidence and trust in me have led to both personal and professional growth. Thank you also for involving me in so many exciting endeavors and for establishing connections with midwives from around the world, whom I had only read about before.

To *Malin Edqvist*, my co-supervisor, thank you for placing your trust in me and for giving me the opportunity to be part of your postdoctoral project, *Oneplus*. Our insightful discussions and collaboration have greatly enriched my knowledge and research skills, which I will carry forward in my ongoing career. It has been a true privilege to have had the opportunity to work with you and get to know you.

To *Maria Ekelin*, my co-supervisor, thank you for your support, your encouraging words over the years, and for always believing in me. Your ability to see things clearly from an outside perspective has been incredibly helpful, and I have greatly appreciated you always being just a phone call away.

To *Hannah Dahlen*, co-author, for generously sharing your wealth of knowledge, providing me with valuable inputs and inspiring me throughout my doctoral journey. You are an outstanding researcher, midwife, and a role model in advocating for your beliefs in support of women around the world.

To *Ingegerd Hildingsson*, for all the time and effort you have put into reviewing my thesis and providing valuable inputs. Your exceptional expertise in the field is impressive.

To *Cecilia Häggsgård*, my truly academic confidante, thank you for allowing me to share this journey with you. I cannot emphasise enough how much you have meant

to me during these years. Thank you for the multitude of emotions we have shared and our friendship that has become far beyond measure.

To *Anna-Karin Dykes*. Thank you for being a role model to me ever since I started my nursing education in 1996. I am so grateful for the opportunity to get to know you and to discuss my research with you.

To my colleagues at the midwifery education program at Lund university *Eva Persson*, *Li Thies-Lagergren*, *Pernilla Ny*, *Ingela Sjöblom*, and *Maria Ekstrand Ragnar*. Thank you for your support during these years, and your invaluable contributions during our research seminars. All of you have meant so much to me!

To *Karin Ängeby*, *Karin Listermar Henley, Karin Johnsson* and *Anna Blomgren* for your fantastic collaboration during the data collection process.

To my fellow doctoral students *Mia Kolak*, *Maria Andersson*, *Mia Vilhelmsen,* and *Christel Johansson*, for your great support and enjoyable discussions and for all the laughter!

Thanks to statistician *Susann Ullén* for worthy statistical support and advice, and to *Gabby Mackay Thomsson* for your meticulous language editing work.

To Professor *Marie Berg* and Professor *Susanne Georgsson* for valuable input at my half time review.

Thanks to my colleagues at the Malmö Birth Unit who did an amazing job! You are all absolute stars! A special thanks to my colleague and friend *Helena Andersén* for all your incredible support and assistance during data collection.

Thanks to my managers at the Malmö Birth Unit *Hanna Holst*, *Camilla Rosenquist,* and *Susanna Heinonen Roth* for constantly supporting and prioritising my research. Also, thanks to *Pia Teleman* and *Stefan Hansson* for supporting and promoting my research at the clinic, and that of others.

To my family and friends for your support and patience during this time. A special thanks to my beloved father *Jörgen* for always believing in me, and for painting the front and back cover of this thesis. To *Yvonne*, my sister *Anette,* and my mother-in-law *Ulla* for encouraging me throughout this journey, and for reminding me who I am outside the world of research.

To my husband, *Jörgen*, my love in life, my soulmate and best friend. Thank you for your unwavering belief in me, our profound discussions, and the way you have been my constant pillar of support. Also, I want to thank you for your ability to inspire and encourage me during moments of uncertainty. I am truly grateful to share my life with you.

My deepest thanks go to my daughters *Hanna* and *Linn*. I am truly blessed to have two such wonderful and wise daughters who have supported me in shifting my focus from research during this time. You occupy the most paramount position in my heart, and I value you above everything else in my life.

My final thanks go to my beloved mother, *Rose-Marie*, who left us too soon. Even in your physical absence, your influence on me is, and will forever be, profound. This is for you.

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