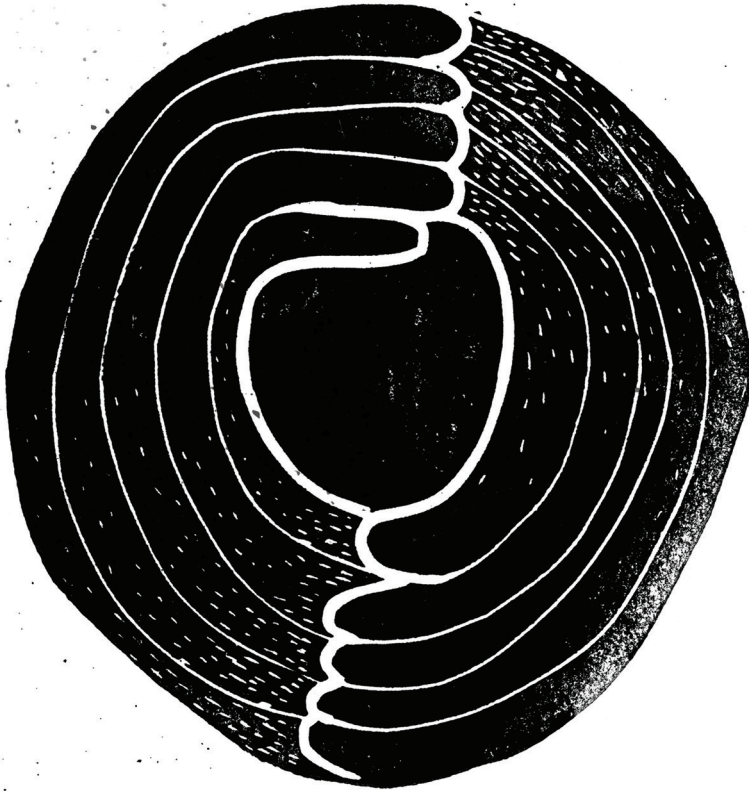


Nele Martens



GROUP CARE IN THE FIRST 1000 DAYS

the implementation of context-sensitive group care

GROUP CARE IN THE FIRST 1000 DAYS

the implementation of context-sensitive group care

2025

Nele Martens

GROUP CARE IN THE FIRST 1000 DAYS:

the implementation of context-sensitive group care

Nele Martens, 2025

Department of Public Health and Primary Care, Leiden University Medical Center

ISBN: 978-94-6506-977-7

Provided by thesis specialist Ridderprint, ridderprint.nl

Printing: Ridderprint | www.ridderprint.nl

Layout: Joey Roberts | www.ridderprint.nl

Illustrations: Katja Reimers

Copyright © 2025 Nele Martens, Amsterdam, the Netherlands.

This thesis is protected by international copyright law. All rights reserved. No part of this thesis may be reproduced, stored, or transmitted in any form or by any means without prior permission of the author, or when applicable, of the publishers of the scientific papers.

Financial support for the printing of this thesis was kindly provided by the department of Public Health and Primary Care, Leiden University Medical Center

Group Care in the first 1000 days:
the implementation of context-sensitive group care

Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op dinsdag 11 maart 2025
klokke 13.00 uur

door

Nele Martens
geboren te Ratzeburg (Duitsland)
in 1990

PROMOTIECOMMISSIE

Promotoren

Prof. dr. R. Reis

Prof. dr. M.R. Crone, Maastricht Universiteit

Co-promotor

Dr. R.M.J.J. van der Kleij

Leden van de promotiecommissie

Prof. dr. J.C. Kiefte-de Jong

Prof. dr. T.H. van den Akker

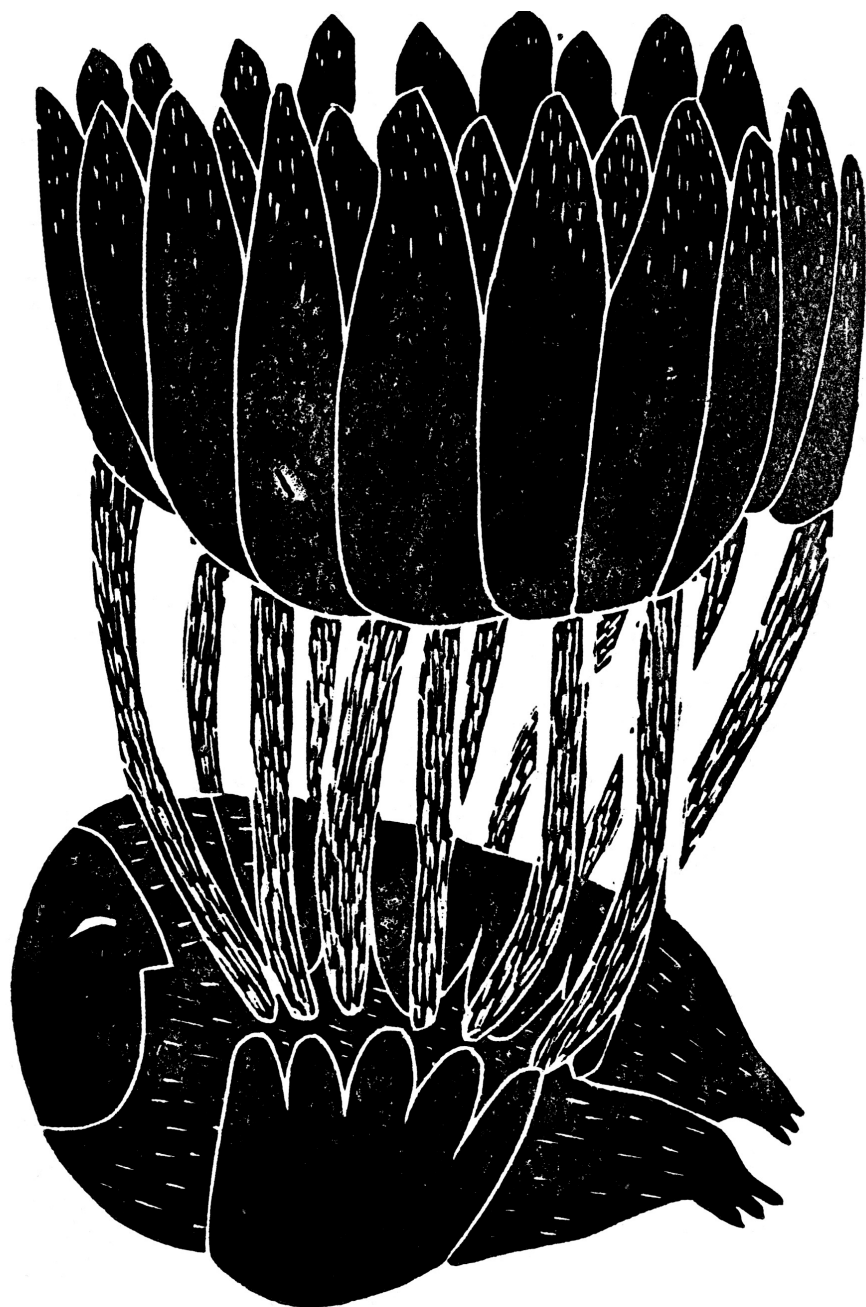
Dr. M.J.C. Hendrix, Zuyd Hogeschool

Prof. dr. C.J.M. Verhoeven, Amsterdam University Medical Center

The research described in this thesis was supported by a grant from the European Commission's Horizon 2020 research and innovation programme under grant agreement 848147.

TABLE OF CONTENTS

Chapter 1	General introduction	9
Chapter 2	Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. Martens, N., Crone, M.R., Hindori-Mohangoo, A. et al. Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. Implement Science Communication 3, 125 (2022).	23
Chapter 3	Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis Martens, N., Hindori-Mohangoo, A.D., Hindori, M.P. et al. Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis. BMC Pregnancy Childbirth 23, 592 (2023).	43
Chapter 4	Implementing group care in Dutch and Surinamese maternity and child care services: the vital importance of addressing outer context barriers Martens, Nele, Tessa MI Haverkate, Ashna D. Hindori-Mohangoo, Manodj P. Hindori, Carolien J. Aantjes, Katrien Beeckman, Astrid Van Damme et al. "Implementing group care in Dutch and Surinamese maternity and child care services: the vital importance of addressing outer context barriers." BMC Pregnancy and Childbirth 24, 527 (2024).	71
Chapter 5	Implementation of antenatal group care in two Dutch settings: a process evaluation	99
Chapter 6	General Discussion	133
Appendices		153
	Samenvatting in het Nederlands	154
	Curriculum Vitae	158
	Acknowledgements	160
	Summary	162



CHAPTER 1

General Introduction

GLOBAL MATERNAL HEALTH

A Significant reduction of the Maternal Mortality Rate (MMR) has been achieved globally. In 2020, the global MMR reduced to 223 per 100 000 [1]. However, the benchmark of 70 per 100 000, as part of the Sustainable Development Goals proposed by the United Nations (UN) [2], is still out of reach. In many regions, the decline in MMR has stagnated or even increased, and on average every two minutes a woman dies due to preventable causes related to pregnancy and/or child birth.¹

While the reduction of MMR is of primary importance, adverse pregnancy outcomes with medium-term and long-term consequences, including sexual and reproductive health, cardiovascular, neurological, endocrine and mental health conditions, are somewhat neglected [3]. Moreover, cardiometabolic disorders that develop during pregnancy, such as hypertensive disorders and gestational diabetes, can be prevented, or when not prevented they can be medically managed [4]. However, when undetected cardiometabolic disorders can cause numerous pregnancy complications affecting mother and child [5]. In most cases, perinatal mortality is preceded by one of the “BIG4” conditions - congenital abnormalities, intrauterine growth restriction (small for gestational age, birth weight below the tenth percentile for gestational age, gender, and parity-specific), preterm birth (less than 37 weeks of gestation), or low Apgar score [6,7]. Infant and maternal health are intimately linked; for instance maternal lifestyle influences perinatal outcomes, such as the “BIG4” [8-12]. However, maternal and neonatal health go beyond the absence of disease and survival [13]; in recent years perinatal well-being and a positive pregnancy experience have been promoted [14]. Perinatal well-being is a dynamic and subjective experience marked by affective, cognitive, physiological and relational changes, and contextual factors shape how women experience the multidimensional transition into motherhood [15].

Maternal health is determined by a combination of proximal and distal factors. Proximal factors that directly impact mothers' health include exposure to chemicals, infections, and violence, while more distal factors, such as gender inequality and low maternal education, are indirectly linked to maternal mortality and morbidity [14]. Souza and colleagues illustrate the impact of upstream or superdeterminants (economic system, culture, political system, climate) on social and individual factors, which in turn influence exposures and lifestyle of pregnant women [14]. The health care system lies at the interface of these multidimensional forces and maternal health; it can serve as a buffer and shape pregnancy outcomes [14].

A HUMAN-CENTRED APPROACH TO PERINATAL CARE: GROUP CARE

Experts in the field of maternal health have denounced the mono-dimensional medical approach of pregnancy and birthing as well as disrespectful maternity care services (i.e., physical or verbal abuse, stigma/discrimination, medical interventions without consent) [16-18]. The World Health Organization (WHO) pleads for “care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth.” [19] A shift towards a holistic, human-centred approach for preconception, antenatal and postnatal care has been called for as high quality health care services can channel and shape the impact of proximal and distal influences on maternal health [16-18,20]. Centering Pregnancy, introduced in 1998 in the United States (US), is a Group Care (GC) model that aligns with this holistic approach [21]. Centering Pregnancy brings eight to twelve women of similar gestational age together for 90-minute antenatal GC sessions that combine risk assessment (health care), education (interactive learning) and peer support (community building) [21,22].

A typical GC session begins with health assessments. As the pregnant women arrive they start collecting and recording their own health data, including blood pressure, weight and gestational age [22]. Such self-assessment activities are not only educational but they also foster agency. One at the time, the women and clinician have a short one-on-one moment in a somewhat private area in the same room. Often a room divider is used. During those one-on-one moments, the women’s belly is palpitated (and sometimes the foetal heart rate is monitored) and problems of personal nature are discussed. Subsequently, the women and clinician(s) gather in an open circle to discuss issues raised by group members and topics the Health Care Professionals (HCP) planned to address, such as nutrition, breast feeding, safe sex, stress management, preterm birth, gestational diabetes, preparing for birth. Interactive exercises are used to avoid didactic presentations and women are encouraged to share their questions and concerns. Facilitating GC sessions demands additional skills which is why HCPs follow a GC training before running groups. Stability of facilitators and group members, time for socialising and healthy snacks that are shared with peers are thought to additionally facilitate building of trust and community. The vignette in the text box below illustrates a first GC sessions.



Vignette: First GC session

Setting the scene

Anne is 12 weeks pregnant with her first child and today is her first GC appointment. At the health care centre Anne meets the GC facilitators, Jane who is a midwife and Lisa, a maternity assistant. They welcome Anne and introduce her to a few other pregnant women. Anne takes a seat on one of chairs that form a circle and she starts talking to her peers.

A few more women arrive when Jane announces that they are complete now. 12 pregnant women are present and they all take a seat in the circle. Jane explains how GC works: Throughout all meetings, the same health care professionals will facilitate the sessions, Jane and Lisa. Also, the same women will attend and no one else will join at a later stage. Jane explains that Lisa will teach the women how to take health measurements, while Jane will check the health of mother and baby individually behind a room divider.

Self-assessment

Next, Anne and the other women learn how to measure their own blood pressure and Lisa explains why this is important. Anne measures her blood pressure and she records it in her note book/app. During the following appointments, Anne and the other women will be able to take this measurement by themselves and they will be able to monitor their records throughout the pregnancy. In this way, the women learn to recognize health complications, which makes Anne feel empowered.

Health assessment

After Anne's weight and blood pressure were checked, Jane invites Anne to join her at the back of the room. This part of the room is somewhat more private as a room divider separates it from the women's circle. Jane asks Anne to lay down on a mat, she listens to the baby's heartbeat and she palpates Anne's belly. Anne is very curious and wants to know exactly what Jane feels with her hands. Jane welcomes Anne's curiosity and she responds that her questions will be addressed during the discussion so that the other women can also hear the explanation and share their input.

Discussion

After about 30 minutes all health assessments are taken and Lisa invites everyone to join the circle. Jane opens the discussion by asking about the women's expectations. A few women want to learn more about lifestyle during pregnancy. Jane begins the conversation by asking: "What do you think is important during pregnancy with regards to your health?". Avoidance of alcohol, tobacco and drugs and taking supplement are mentioned. In this way, everyone shares their thoughts and questions. Anne is surprised to learn about the severe consequences of high blood pressure during pregnancy. She also did not know that drinking alcohol can increase her blood pressure.

After discussing health behaviours during pregnancy, it is time for a break, which allows the women to chat informally over a cup of tea. Subsequently, the discussion continues and Anne begins to have a better understanding of what to expect from GC. Jane explains that pregnancy-related issues that are frequently overlooked will also be addressed, such as mental health challenges.

About two hours after Anne arrived this first GC session ends.

Evidence for numerous benefits of GC has been reported, including higher satisfaction with care of service users [23] and service providers [24], increased uptake of antenatal care services [25-28], improved health literacy (on how to prevent and recognize problems) and health behaviours [29-31], higher breastfeeding rates [26,32,33], lower risk of maternal hypertensive disorders [32], improved pregnancy outcomes [32,34-36], and long-term cost-effectiveness [37]. Yet, with the exception of high-risk groups [38], meta-analyses and reviews have not been conclusive on clinical outcomes [26,39-44]. Nonetheless, the diversity of reported benefits evokes the question why individual antenatal care remains the dominant paradigm, especially in low-resource settings where maternal morbidity and mortality are highest [1,45].

Implementation challenges can (partially) explain the slow scale-up of GC. Increased workload [27], sparse resources [46-50], resistance to change [46,48,49,51], scheduling/time management challenges [47,49,52], instability of groups [47,48,50], poor facilitation quality [47], insufficient space [48,53] and recruitment challenges [48,49,53-56] have been reported to hinder GC implementation. Potential consequences of such barriers are two-fold; they can slow down the scale-up of GC and they can cause implementation failure: when EBIs, such as GC, are not well implemented, anticipated public health gains are not attained [57,58].

IMPLEMENTATION STRATEGIES AND OUTCOMES

Implementation is the act of carrying out an intention into effect, encompassing the dissemination and sustained use of Evidence Based Interventions (EBIs) [58]. Among others, implementation science helps us shine light on implementation barriers and facilitators, ultimately maximising public health impact through the development and application of effective implementation strategies [57]. The *GC during the first 1000 days (GC_1000)* project was designed to examine the implementation process of GC in seven diverse countries; first performing context analyses, informing the development of adaptation- and implementation strategies and study the subsequent implementation of GC in these countries.

Contrary to classic efficacy and effectiveness trials, implementation scientists do not seek to control, or to tolerate context, instead they actively study and engage with contextual factors at individual, organisational, and societal level to increase uptake of EBIs [57]. Context is the multi-layered set of dynamic characteristics and circumstances influencing implementation [59]. Individual and contextual factors play a crucial role in implementation science, and determinant frameworks, such as the Consolidated Framework for Implementation Research (CFIR), were developed to disentangle contextual barriers and facilitators [60-63]. The CFIR synthesises evidence and describes implementation determinants across five domains [61-62]. The innovation domain consists of factors related to the EBI, such as adaptability and design of the EBI. Critical incidences (e.g., a pandemic), local attitudes (e.g., high regard for privacy) as well as policies and laws fall under the outer setting domain, while anything related to the implementing organization (e.g., organisational infrastructure and culture) is referred to as the inner setting. The inner setting is embedded in the outer setting. The individuals' domain encompasses characteristics, including motivation, opportunity, capability and needs of persons with different roles, such as implementation leads and implementation deliverers. Finally, the process domain includes activities used to implement an EBI, for example assessing needs and context, and tailoring/adapting the EBI. Thus far, little is known about adapted CG models that are tailored to the context; more research is warranted [53,64-66].

The implementation science project *GC_1000* aimed to not only develop tailored GC models and context-sensitive implementation strategies but also to evaluate their implementation [60,63]. Implementation outcomes differ from effectiveness outcomes. Proctor's taxonomy, for instance, proposes eight implementation outcomes: acceptability, adoption (i.e., intention to try EBI), appropriateness (i.e., perceived fit prior to adoption), feasibility (i.e., actual fit during adoption), fidelity

(i.e., adherence), implementation costs, penetration (i.e., level of institutionalization) and sustainability (i.e., routinization). Within GC_1000 various implementation outcomes were studied, such as implementation costs and sustainability. The focus of this thesis, however, is on fidelity to the GC model. Fidelity is the extent to which an EBI is carried into effect as originally intended by the developers [67]. Studying fidelity allows for comparison and generalisability of findings, it provides information on the feasibility of an EBI and it illuminates the reasons for attaining, or failing to attain certain innovation outcomes, such as pregnancy outcomes and satisfaction with care [67,68]. Indeed, Novick and colleagues report that compromised fidelity led to decreased commitment and satisfaction of HCPs and service users, and eventually to discontinuation of GC [48]. Hence, while consideration of contextual factors and adaptations that improve intervention-context fit are crucial, fidelity to the essential elements of GC is imperative [69]. Nevertheless, both fidelity and adaptation play an important role in implementation; they can co-occur and do not need to compromise one another [69,70]. Understanding what is needed in different contexts for a successful implementation can support the adherence to essential elements of GC. Although assessing fidelity in complex, group-level interventions can be challenging, exploring the balance between fidelity and adaptations is essential to furthering our understanding of what, works for whom under which circumstances [68,69].

In this thesis, contextual barriers and facilitators in different countries are assessed to inform tailored adaptations and implementation strategies that can support the implementation of the essential elements of GC in different contexts. To further our knowledge on context-sensitive GC and the balance between fidelity and adaptations, the implementation process is evaluated. The *GC_1000* project was funded by the European Commission Horizon 2020 research programme (848147).

AIMS AND OUTLINE OF THIS THESIS

The objectives of this thesis are (1) to describe an implementation research study design that aims to provide leads for upscaling of GC internationally, (2) to identify determinants of implementability (i.e. anticipated implementation determinants) of GC, and (3) to evaluate the implementation of context-sensitive GC.

In **Chapter 2** a study design for GC_1000 is proposed. Seven different countries were included to capture diversity with regard to implementation challenges, health systems and cultural and economic factors, to enable the development of a widely applicable implementation strategy toolbox. **Chapter 3** reports the



findings of the context analysis in Suriname and in **Chapter 4** the implementation determinants in the Netherlands are compared with those in Suriname. **Chapter 5** reports the findings of the process evaluation from two Dutch settings. Gresh's conceptual framework [71] is used to assess input, fidelity to core components and outcomes. Finally, in **Chapter 6**, all findings and specific challenges encountered in implementation science projects, such as GC_1000, are discussed and implications are drawn.

REFERENCES

1. World Health Organization & UNICEF. Trends in maternal mortality 2000 to 2020. (2023).
2. Lee, B.X., *et al.* Transforming our world: implementing the 2030 agenda through sustainable development goal indicators. *Journal of public health policy* **37**, 13-31 (2016).
3. Vogel, J.P., *et al.* Neglected medium-term and long-term consequences of labour and childbirth: a systematic analysis of the burden, recommended practices, and a way forward. *The Lancet Global Health* **12**, e317-e330 (2024).
4. World Health Organization. Strategies towards ending preventable maternal mortality (EPMM). (2015).
5. Jiang, L., *et al.* A global view of hypertensive disorders and diabetes mellitus during pregnancy. *Nature Reviews Endocrinology* **18**, 760-775 (2022).
6. Apgar, V. A proposal for a new method of evaluation of the newborn infant. *Anesthesia & Analgesia* **32**, 260-267 (1953).
7. van der Kooy, J., *et al.* Planned home compared with planned hospital births in the Netherlands: intrapartum and early neonatal death in low-risk pregnancies. *Obstetrics & gynecology* **118**, 1037-1046 (2011).
8. Mate, A., Reyes-Goya, C., Santana-Garrido, Á. & Vázquez, C.M. Lifestyle, maternal nutrition and healthy pregnancy. *Current vascular pharmacology* **19**, 132-140 (2021).
9. Bakker, R. Maternal Lifestyle and Pregnancy Complications: The Generation R Study. (2011).
10. Rajan, S.S., Vijayalakshmi, R., Nadu, T. & Kanchana, S. The effect of maternal lifestyle factors on pregnancy complications and perinatal outcome. *International Journal of Advance Research, Ideas and Innovations in Technology* **4**, 2241-2248 (2018).
11. Carter, T., Schoenaker, D., Adams, J. & Steel, A. Paternal preconception modifiable risk factors for adverse pregnancy and offspring outcomes: a review of contemporary evidence from observational studies. *BMC Public Health* **23**, 509 (2023).
12. Teede, H.J., *et al.* Association of antenatal diet and physical activity-based interventions with gestational weight gain and pregnancy outcomes: a systematic review and meta-analysis. *JAMA internal medicine* **182**, 106-114 (2022).
13. Almond, D. & Currie, J. Killing me softly: The fetal origins hypothesis. *Journal of economic perspectives* **25**, 153-172 (2011).
14. Souza, J.P., *et al.* A global analysis of the determinants of maternal health and transitions in maternal mortality. *The Lancet Global Health* **12**, e306-e316 (2024).
15. Wadephul, F., Glover, L. & Jomeen, J. Conceptualising women's perinatal well-being: a systematic review of theoretical discussions. *Midwifery* **81**, 102598 (2020).
16. Bohren, M.A., *et al.* How women are treated during facility-based childbirth in four countries: a cross-sectional study with labour observations and community-based surveys. *The Lancet* **394**, 1750-1763 (2019).
17. Bohren, M.A., *et al.* The mistreatment of women during childbirth in health facilities globally: a mixed-methods systematic review. *PLoS medicine* **12**, e1001847 (2015).
18. Bohren, M.A., Tunçalp, Ö. & Miller, S. Transforming intrapartum care: Respectful maternity care. *Best Practice & Research Clinical Obstetrics & Gynaecology* **67**, 113-126 (2020).
19. World Health Organization. *WHO recommendations on intrapartum care for a positive childbirth experience*, (World Health Organization, 2018).
20. Health, T.L.G. Postnatal morbidity: prevalent, enduring, and neglected. Vol. 12 e1 (2024).
21. Rising, S.S. Centering pregnancy. An interdisciplinary model of empowerment. *J Nurse Midwifery* **43**, 46-54 (1998).
22. Rising, S.S. & Quimby, C.H. *The CenteringPregnancy model: the power of group health care*, (Springer Publishing Company, 2016).

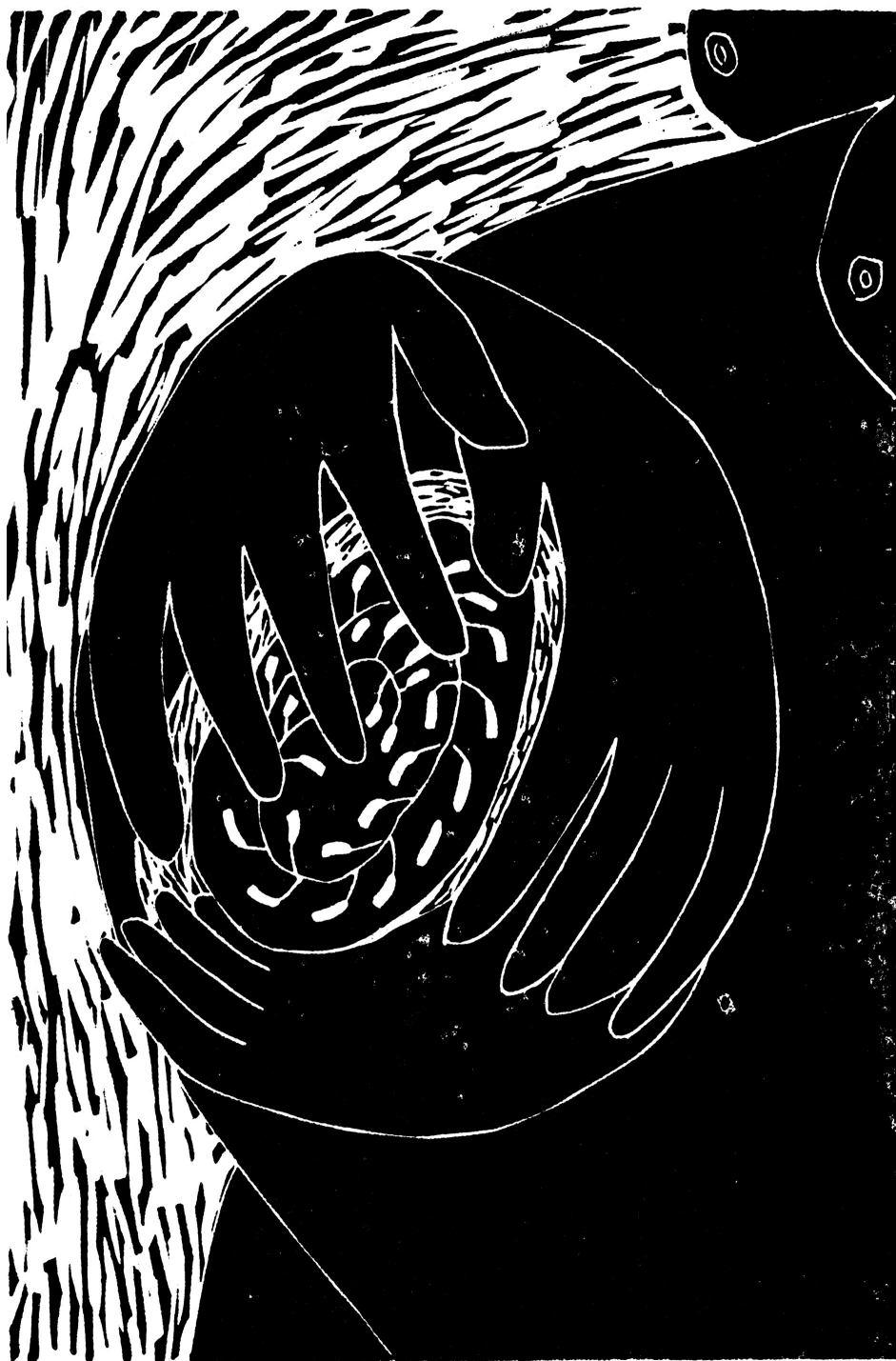


23. Sadiku, F., *et al.* Maternal Satisfaction with Group Care: A Systematic Review. *AJOG Global Reports*, 100301 (2023).
24. Lazar, J., Boned-Rico, L., Olander, E.K. & McCourt, C. A systematic review of providers' experiences of facilitating group antenatal care. *Reproductive Health* **18**, 1-21 (2021).
25. Noguchi, L., *et al.* Effect of group versus individual antenatal care on uptake of intermittent prophylactic treatment of malaria in pregnancy and related malaria outcomes in Nigeria and Kenya: analysis of data from a pragmatic cluster randomized trial. *Malaria Journal* **19**(2020).
26. Manant, A. & Dodgson, J.E. CenteringPregnancy: An Integrative Literature Review. *Journal of Midwifery & Women's Health* **56**, 94-102 (2011).
27. Rijnders, M., Jans, S., Aalhuizen, I., Detmar, S. & Crone, M. Women-centered care: Implementation of CenteringPregnancy® in The Netherlands. *Birth* **46**, 450-460 (2019).
28. Grenier, L., *et al.* Impact of group antenatal care (G-ANC) versus individual antenatal care (ANC) on quality of care, ANC attendance and facility-based delivery: a pragmatic cluster-randomized controlled trial in Kenya and Nigeria. *PLoS One* **14**, e0222177 (2019).
29. Lori, J.R., Ofosu-Darkwah, H., Boyd, C.J., Banerjee, T. & Adanu, R.M. Improving health literacy through group antenatal care: a prospective cohort study. *BMC Pregnancy and Childbirth* **17**, 1-9 (2017).
30. Wagijo, M.-a., *et al.* Contributions of CenteringPregnancy to women's health behaviours, health literacy, and health care use in the Netherlands. *Preventive Medicine Reports* **35**, 102244 (2023).
31. Swift, E.M., Zoega, H., Stoll, K., Avery, M. & Gottfreðsdóttir, H. Enhanced Antenatal Care: Combining one-to-one and group Antenatal Care models to increase childbirth education and address childbirth fear. *Women and Birth* **34**, 381-388 (2021).
32. Wagijo, M.a., *et al.* The Effect of CenteringPregnancy Group Antenatal Care on Maternal, Birth, and Neonatal Outcomes Among Low-Risk Women in the Netherlands: A Stepped-Wedge Cluster Randomized Trial. *Journal of Midwifery & Women's Health* (2024).
33. Lori, J.R., Chuey, M., Munro-Kramer, M.L., Ofosu-Darkwah, H. & Adanu, R.M. Increasing postpartum family planning uptake through group antenatal care: a longitudinal prospective cohort design. *Reproductive health* **15**, 1-8 (2018).
34. Carter, E.B., *et al.* Group versus traditional prenatal care in low-risk women delivering at term: a retrospective cohort study. *Journal of Perinatology* **37**, 769-771 (2017).
35. Abshire, C., McDowell, M., Crockett, A.H. & Fleischer, N.L. The impact of CenteringPregnancy group prenatal care on birth outcomes in Medicaid eligible women. *Journal of Women's Health* **28**, 919-928 (2019).
36. Heberlein, E.C., Smith, J.C., LaBoy, A., Britt, J. & Crockett, A. Birth outcomes for medically high-risk pregnancies: comparing Group to Individual Prenatal Care. *American Journal of Perinatology* **41**, 414-421 (2024).
37. Jans, S., Westra, X., Crone, M., van den Akker-van, M.E. & Rijnders, M. Long-term cost savings with Centering-based group prenatal care. *Midwifery*, 103829 (2023).
38. Byerley, B.M. & Haas, D.M. A systematic overview of the literature regarding group prenatal care for high-risk pregnant women. *BMC Pregnancy and Childbirth* **17**(2017).
39. Catling, C.J., *et al.* Group versus conventional antenatal care for women. *Cochrane Database of Systematic Reviews* (2015).
40. Ruiz-Mirazo, E., Lopez-Yarto, M. & McDonald, S.D. Group prenatal care versus individual prenatal care: a systematic review and meta-analyses. *Journal of Obstetrics and Gynaecology Canada* **34**, 223-229 (2012).
41. Carter, E.B., *et al.* Group Prenatal Care Compared With Traditional Prenatal Care: A Systematic Review and Meta-analysis. *Obstet Gynecol* **128**, 551-561 (2016).

42. Liu, Y., Wang, Y., Wu, Y., Chen, X. & Bai, J. Effectiveness of the CenteringPregnancy program on maternal and birth outcomes: a systematic review and meta-analysis. *International Journal of Nursing Studies* **120**, 103981 (2021).
43. Sheeder, J., Weber Yorga, K. & Kabir-Greher, K. A review of prenatal group care literature: the need for a structured theoretical framework and systematic evaluation. *Maternal and child health journal* **16**, 177-187 (2012).
44. Tilden, E.L., Hersh, S.R., Emeis, C.L., Weinstein, S.R. & Caughey, A.B. Group prenatal care: review of outcomes and recommendations for model implementation. *Obstetrical & gynecological survey* **69**, 46-55 (2014).
45. Gaur, B.P.S., Vasudevan, J. & Pegu, B. Group Antenatal Care: a paradigm shift to explore for positive impacts in resource-poor settings. *Journal of Preventive Medicine and Public Health* **54**, 81 (2021).
46. Wiseman, O., *et al.* The challenges and opportunities for implementing group antenatal care ('Pregnancy Circles') as part of standard NHS maternity care: A co-designed qualitative study. *Midwifery* **109**, 103333 (2022).
47. Harsha Bangura, A., *et al.* Measuring fidelity, feasibility, costs: an implementation evaluation of a cluster-controlled trial of group antenatal care in rural Nepal. *Reproductive health* **17**, 1-12 (2020).
48. Novick, G., Sadler, L.S., Knafl, K.A., Groce, N.E. & Kennedy, H.P. In a hard spot: Providing group prenatal care in two urban clinics. *Midwifery* **29**, 690-697 (2013).
49. Baldwin, K. & Phillips, G. Voices along the journey: midwives' perceptions of implementing the CenteringPregnancy model of prenatal care. *The Journal of Perinatal Education* **20**, 210 (2011).
50. Andrade-Romo, Z., *et al.* Group prenatal care: effectiveness and challenges to implementation. *Revista de Saúde Pública* **53**, 85 (2019).
51. Gaskin, E., Yorga, K.W., Berman, R., Allison, M. & Sheeder, J. Pediatric Group Care: A Systematic Review. *Matern Child Health J* **25**, 1526-1553 (2021).
52. Zielinski, R., *et al.* "With group antenatal care, pregnant women know they are not alone": The process evaluation of a group antenatal care intervention in Ghana. *Plos one* **18**, e0291855 (2023).
53. Heredia-Pi, I.B., *et al.* The Mexican experience adapting CenteringPregnancy: lessons learned in a publicly funded health care system serving vulnerable women. *Journal of midwifery & women's health* **63**, 602-610 (2018).
54. Novick, G., Womack, J.A. & Sadler, L.S. Beyond Implementation: Sustaining Group Prenatal Care and Group Well-Child Care. *Journal of Midwifery & Women's Health* **65**, 512-519 (2020).
55. Pekkala, J., *et al.* Key Considerations for Implementing Group Prenatal Care: Lessons from 60 Practices. *Journal of Midwifery & Women's Health* **65**, 208-215 (2020).
56. Phillippi, J.C. & Myers, C.R. Reasons Women in Appalachia Decline CenteringPregnancy Care. *Journal of Midwifery & Women's Health* **58**, 516-522 (2013).
57. Bauer, M.S. & Kirchner, J. Implementation science: What is it and why should I care? *Psychiatry research* **283**, 112376 (2020).
58. Peters, D.H., Adam, T., Alonge, O., Agyepong, I.A. & Tran, N. Republished research: Implementation research: what it is and how to do it. *British Journal of Sports Medicine* **48**, 731-736 (2014).
59. Pfadenhauer, L.M., *et al.* Context and implementation: A concept analysis towards conceptual maturity. *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen* **109**, 103-114 (2015).
60. Damschroder, L.J. Clarity out of chaos: use of theory in implementation research. *Psychiatry research* **283**, 112461 (2020).

61. Damschroder, L.J., *et al.* Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implementation Science* **4**, 50 (2009).
62. Damschroder, L.J., Reardon, C.M., Widerquist, M.A.O. & Lowery, J. The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science* **17**, 1-16 (2022).
63. Nilsen, P. Making sense of implementation theories, models, and frameworks. *Implementation Science* **3.0**, 53-79 (2020).
64. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. (WHO, 2016).
65. Sharma, J., O'Connor, M. & Rima Jolivet, R. Group antenatal care models in low- and middle-income countries: a systematic evidence synthesis. *Reproductive Health* **15**(2018).
66. Norr, K. & Patil, C. Adapting CenteringPregnancy-based group antenatal care globally. *The CenteringPregnancy model: the power of group health care*. New York: Spring Publishing Company, 223-251 (2016).
67. Dusenbury, L., Brannigan, R., Falco, M. & Hansen, W.B. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. *Health Educ Res* **18**, 237-256 (2003).
68. Ginsburg, L.R., *et al.* Fidelity is not easy! Challenges and guidelines for assessing fidelity in complex interventions. *Trials* **22**(2021).
69. Durlak, J.A. & DuPre, E.P. Implementation Matters: A Review of Research on the Influence of Implementation on Program Outcomes and the Factors Affecting Implementation. *American Journal of Community Psychology* **41**, 327 (2008).
70. Chambers, D.A. Advancing adaptation of evidence-based interventions through implementation science: progress and opportunities. *Frontiers in Health Services* **3**(2023).
71. Gresh, A., *et al.* A Conceptual Framework for Group Well-Child Care: A Tool to Guide Implementation, Evaluation, and Research. *Matern Child Health J*, 1-18 (2023).





CHAPTER 2

Group Care in the first 1000 days

implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings

Published as

Martens, N., Crone, M.R., Hindori-Mohangoo, A. et al. Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. Implement Science Communication 3, 125 (2022). <https://doi.org/10.1186/s43058-022-00370-7>

ABSTRACT

Background

Group care (GC) improves the quality of maternity care, stimulates women's participation in their own care and facilitates growth of women's social support networks. There is an urgent need to identify and disseminate the best mechanisms for implementing GC in ways that are feasible, context appropriate and sustainable. This protocol presents the aims and methods of an innovative implementation research project entitled Group Care in the first 1000 days (GC_1000), which addresses this need.

Aims

The aim of GC_1000 is to co-create and disseminate evidence-based implementation strategies and tools to support successful implementation and scale-up of GC in health systems throughout the world, with particular attention to the needs of 'vulnerable' populations.

Methods

By working through five inter-related work packages, each with specific tasks, objectives and deliverables, the global research team will systematically examine and document the implementation and scale-up processes of antenatal and postnatal GC in seven different countries. The GC_1000 project is grounded theoretically in the consolidated framework for implementation research (CFIR), while the process evaluation is guided by 'Realistic Evaluation' principles. Data are gathered across all research phases and analysis at each stage is synthesized to develop Context-Intervention-Mechanism-Outcome configurations.

Discussion

GC_1000 will generate evidence-based knowledge about the integration of complex interventions into diverse health care systems. The 4-year project also will pave the way for sustained implementation of GC, significantly benefitting populations with adverse pregnancy and birthing experiences as well as poor outcomes.

BACKGROUND

Despite vast improvements over the past two decades, adverse maternal and neonatal outcomes remain major challenges today. This is not only reflected in global health data but also in the United Nations' Sustainable Development Goals (SDGs), which stress the need to improve reproductive, maternal, new born and child health [1]. Despite a 38% decline in the maternal mortality ratio (MMR) since the year 2000 [2], still too many mothers and babies die during pregnancy, labour and postpartum. In 2017, 295,000 women died worldwide due to pregnancy complications or childbirth [2]. This translates to an average of 810 women per day dying from preventable causes related to pregnancy and childbirth. Although 94% of these deaths occurred in low- and middle-income countries (LMIC) [2], poor pregnancy outcomes have also been reported amongst so called vulnerable¹ groups in high-income countries [4, 5]. The main causes of maternal death are severe bleeding, infections, pre-eclampsia and eclampsia, birth complications and unsafe abortions [6]. In most cases, these conditions can be addressed and do not need to be fatal when recognized in a timely manner [7].

Newborns also are at particular risk during child birth and the postpartum period. In 2019, 2.4 million babies died in their first month of life [8]. While children are at greatest risk of death during the first 28 days after birth [8], the first years of life lay the foundation for physical and mental well-being from infancy to and throughout adulthood [9]. Thus, accessible and high-quality antenatal and postnatal care are not only a human right [10], but together they can build the basis for healthy development over the life span [11]. While this has the potential to ultimately foster a healthy population and reduce health expenses in the long-term, access to high-quality maternal health care services remains a privilege. Key factors preventing women from receiving appropriate care include poverty, distance to facilities, lack of information, harmful cultural beliefs and practices and poor quality, disrespectful, or lack of humanized care [7,12]. Poor quality of services often results from shortage of staff and resources, as well as hierarchies and power dimensions within health care and an inattention to human rights [6,7,12].

In order to improve the quality of maternity care and to stimulate women's participation in their own care, a practising midwife developed 'group care' (GC) for antenatal care in the early 90s. Postnatal group/parenting care was

1 For the purpose of this research, de Groot and colleagues' definition of vulnerability [3] was adapted to: 'Vulnerability is a dynamic state that reflects converging effects of a set of interacting and amplifying personal, environmental and structural factors, where risk factors outweigh protective factors leading to enhanced susceptibility to adverse health outcomes in the first 1000 days and hampering recovery.'

subsequently developed so that a continuum of care was available to parents [13]. GC can help to break the vicious cycle of poor quality and inadequate utilization of services by offering care that addresses health holistically, with an integrated approach to health assessment, health education and support. Centering-based GC (CBGC) is a model that was first developed in the USA, consisting of three core components: (1) health care in the form of self-assessments by women and parents, and individual health check-ups conducted by trained clinicians; (2) interactive learning; and (3) peer support/community building [13,14]. Figure 1 describes the CBGC model in more detail. Whereas educative pregnancy group programmes organized outside of routine care are likely to be attended by mothers of mostly high social economic status, CBGC is explicitly offered in and as part of routine care, which makes it accessible to all mothers/parents. Moreover, as CBGC is not merely an educational programme but it also contains a health care component, it can replace routine one-on-one care.

Centring-based Group Care	
One-on-one visits are replaced by group sessions that are facilitated by a trained clinician and co-facilitator. These are not didactic classes but rather facilitated discussions that value the knowledge and experience of group participants, enabling them to learn collectively. Session topics are planned but emphasis may vary based on the health needs of the group. Moreover, other topics can be added, depending on the context and needs of the group. Group activities allow participants to learn in dynamic ways that are engaging and help to create mutual support among the participants.	
Group antenatal care	Group postnatal+ care (up to 2 years)
Groups consist of around 8-12 women of similar gestational age. Sessions last 90 to 120 minutes. Each session has three main parts: 1. Brief individual clinical assessments with the care provider 2. Self-assessment of measures such as weight and blood pressure 3. Facilitated group discussion based on the group's needs, experiences and interests	Groups consist of around 6-12 mother/parent-infant dyads. Sessions last 90 to 120 minutes. Each session has three main parts: 1. Brief individual clinical assessments of the baby by the care provider 2. Parent self-assessment of infant and maternal health and well-being 3. Facilitated group discussion based on the group's needs, experiences and interests

While no direct impact on maternal mortality and infant survival have been demonstrated, improved birth outcomes, such as higher birth-weight and lower preterm-birth rates, have been reported amongst women who attended antenatal GC [15,16,17,18,19]. In two studies, preterm birth rates were particularly reduced for low-income African-American women participating in GC in the USA, which suggests that marginalized or under-served populations can benefit from GC [16, 17]. However, according to recent systematic reviews, the evidence is still not sufficient to unconditionally claim that CBGC leads to improved birth outcomes [20,21,22]. Even if CBGC did not significantly ameliorate the rates of preterm birth

and low birth weight, the most recent review, including only randomized controlled trials, reports that the overall rates of preterm birth and low birth weight were lower in CBGC groups compared to individual care. In addition, it showed some evidence for improved psychosocial outcomes in CBGC-groups.

Other important benefits of CBGC, described in qualitative research, include an improved woman-provider experience, enhanced self-care, empowerment, enhanced learning about health behaviours, enriched networks of relationships and increased social support [23]. CBGC has also been shown to raise clinicians' motivation [24,25,26,27] and may provide savings to the health care system [28, 29]. Moreover, antenatal CBGC has been shown in some settings to increase women's attendance at antenatal and postnatal visits significantly. For example, one study in Malawi and Tanzania showed that 94% of women in antenatal CBGC versus 58% in individual care attended all recommended ANC visits and 75% versus 50% attended the 6-week postnatal visit [30]. Despite these promising findings, the CBGC model has not been integrated into standard midwifery/obstetric or maternity care outside the USA and disparate factors are likely to impact the implementation of CBGC in diverse health care systems. Frequently implementation, i.e. the act of carrying out an intention into effect [31], fails when contextual factors are not considered [32,33]; implementation failure can be mitigated by developing and applying contextually driven implementation strategies [34,35,36,37].

This article presents the aims and methods of an innovative implementation research project entitled GC during the first 1000 days (GC_1000), which addresses the need to identify and disseminate the best mechanisms for implementing GC in ways that are feasible, appropriate to context, sustainable and scalable. GC_1000 began in January 2020 and is funded for a four-year period through the European Commission's Horizon 2020 research and innovation programme under grant agreement 848147.

Aims

The overall aim of GC_1000 is to co-create and disseminate evidence-based implementation strategies and tools to support successful implementation and scale-up of GC in the first 1000 days in health systems throughout the world, with particular attention to the needs of vulnerable populations. The project takes place in seven countries and has five specific objectives:

1. To identify context-specific factors that enhance or impede transition from individual provider-to-user care to antenatal and postnatal+ group care, considering the needs of women and families, the issues care providers face and the opportunities and restrictions of health care systems
2. To develop and employ implementation strategies adapted to the specific contextual needs, leading to successful implementation of GC with at least five antenatal and/or postnatal+ groups per country
3. To monitor and evaluate the implementation of GC regarding process, fidelity, sustainability, costs, indicators of impact and perceptions of benefit
4. To develop and deliver seven country blueprints for the scale-up of antenatal and postnatal GC based on implementation success and challenges
5. To develop and disseminate a GC_1000 implementation strategy toolbox for the adaptation, implementation and scale up of group antenatal and postnatal+ care

METHODS/DESIGN

Implementation sites are located in seven countries including four European (The Netherlands, Belgium, England and Kosovo), two African (Ghana and South Africa) and one South American (Suriname) (Table 1). This selection of countries allows for capturing diversity with regard to implementation challenges, health systems and cultural and economic factors, which will ultimately enable the development of a widely applicable implementation strategy toolbox (Table 1).

Table 1. Implementing countries and their rationale for inclusion

Country	Rationale for inclusion
Suriname	Suriname has high rates of maternal deaths (MMR of 120 per 100,000 live births) and perinatal deaths (25 per 1000 births) and adverse birth outcomes. Adverse pregnancy and birth outcomes have been associated with socio-demographics and environmental factors, such as lack of social support, insufficient knowledge, poor living conditions and substandard care. Antenatal GC was introduced in Suriname in 2014 as the SamenZwanger-health care model and its expansion can help to improve maternal and child health in Suriname. As such, the GC model has to be adapted for vulnerable women and it will be implemented in deprived communities.

Country	Rationale for inclusion
The Netherlands	In the Netherlands, the number of adverse perinatal outcomes is higher in non-Western women and in Western women living in disadvantaged areas. Adverse outcomes are associated with lifestyle but also with system failure. It has been argued that specific care and attention should be given to so-called marginalized groups and recently the government funded the programme 'A promising Start' aimed at addressing health inequalities during the first 1000 days of child's life. Although group ANC has been successfully implemented, it needs to be expanded to mother-infant care and adapted to better reach under-served, marginalized and migrant women.
England	A government recommendation in 2010 highlighted the priority to early infant years including maternal and infant health to achieve a long-term sustainable reduction in health inequalities. English policy for maternity services in 2015, Better Births, recommended a greater focus on continuity of carer, personalized care and attention to perinatal mental health. Currently, a model of group antenatal, Pregnancy Circles, tailored to a local community and services in an inner-city area of high socio-economic, cultural, ethnic and linguistic diversity is being researched. The model will be further researched and expanded to postnatal care.
Ghana	Access to quality of health services is still challenging for rural communities in Northern Ghana. For instance, while it takes an average 30 min to reach a health facility in urban Ghana, in some parts of rural Northern Ghana accessing a health facility can take as much 3 h. There is a lack of adequate testing materials for ANC in most rural facilities. Psycho-social care, birth preparedness plans and parenting information are not adequately covered during antenatal and postnatal visits. It is anticipated that antenatal GC services tailored to women's needs will be delivered to rural and poor communities in Ghana.
Kosovo	The infant mortality rate in Kosovo is the highest in Europe. One of the major challenges is to improve parenting skills as a lack of knowledge about adequate home care management, child physical and cognitive development and reproductive health prevails. Further, the immunization rate remains low amongst Roma, Ashkali and Egyptian communities and inappropriate breastfeeding and infant feeding patterns raise major concerns. Most women do not receive any preventative educational services; hence, system change towards Group antenatal and mother-infant care in Kosovo can strengthen the provision of women-centred care that is informative, supportive and empowering especially for the underserved Roma population.
Belgium	Large cities in Belgium are characterized by high levels of poverty. In Brussels, 33% of the children are born in poverty. Inequities in health care have been identified as evidenced by an increased perinatal mortality rate amongst children of mothers with low educational level, who are single parents and not active in the labour market. Most of these women have mixed foreign ethnic origins. It is anticipated that GC can make a difference for these women, yet the current health care model hinders its implementation. The results of the GC_1000 project will be used for advocacy activities targeting policy-makers and health care managers to ensure sustainability of the model.
South Africa	South Africa is of the most unequal countries in the world, reporting a per-capita expenditure Gini coefficient of 0.65 in 2015. Despite free primary health care, including ANC, stark inequities persist between rural and urban areas as well as the private and public health care sectors. Pregnancy is a critical time for diagnosis, maternal treatment and prevention of HIV transmission to children. HIV prevalence rates are as high as 30% amongst pregnant women. In addition, there are clear evidence-based links between alcohol use and health issues, HIV/AIDs and gender-based violence, as well as crime, road accidents and interpersonal violence. Non-, late and infrequent attendance at ANC is amongst the top five avoidable factors in perinatal deaths and amongst the most common underlying causes of patient-related maternal mortality. It is expected that antenatal GC can contribute significantly to tackle these issues.

To allow systematic and consistent identification of the interplay between intervention characteristics and the context in which the intervention is implemented, we chose the Consolidated Framework for Implementation Research (CFIR) as the basic analytical framework guiding the GC_1000 project [35]. The CFIR was developed to guide systematic assessment of multilevel implementation contexts and to identify factors that might influence intervention implementation and effectiveness. The CFIR describes five interacting domains for studying implementation and capturing learning [35]. These are:

- The intervention: the characteristics of core components of the intervention, such as complexity, cost and evidence strength, play a crucial role.
- Outer setting: the economic, political and social contexts in which an intervention is carried out and that are external to the implementing organization/institution.
- Inner setting: the context within the implementing organization/institution, including the structure of the organization, its culture (internal climate) and networks and its readiness for change.
- Individuals involved: the characteristics of the people who will have a direct role in the implementation process. This includes educators, health professionals, managers in various parts of the organization/institution, policymakers, service users and many other stakeholders and beneficiaries.
- Process for implementation: this incorporates all methods and approaches used in facilitating, adopting, implementing and continuing the intervention at all levels of the organization, including the planning of strategies and activities. Processes include both those explicitly planned as well as unforeseen processes that emerge during implementation.

Throughout GC_1000, we examine which constructs listed in the CFIR may influence the implementation of GC and consequently implementation outcomes. This will enable us to develop theory-based adaptation and implementation strategies for GC. The methods/methodologies that are used in the different steps are detailed below.

A multi-phase sequential design to implementation has been adopted to achieve our objectives. The GC_1000 consortium is grouped into five inter-related Work Packages (WPs) with specific tasks, objectives and deliverables, as seen in Fig. 2 (and on the website: <https://groupcare1000.com/>).

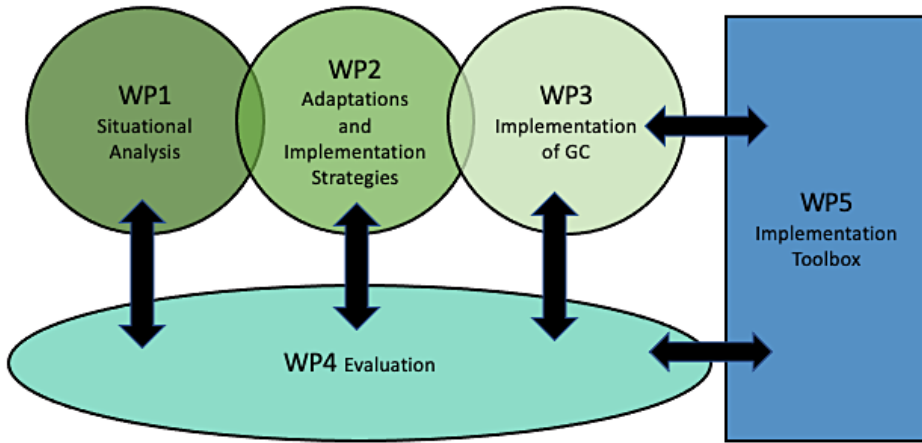


Figure 2. GC_1000 work packages

WP1 leads situational analyses in each setting, with the aim of identifying setting-specific implementation barriers, facilitators and service users' needs by means of Rapid Qualitative Inquiries (RQI). RQI is a team-based technique for collecting qualitative data in a concise and time-effective way. It is based upon three basic principles:

- Focus on insider's perspective
- Multiple sources for data collection
- Iterative data collection and analysis allowing for quick preliminary insights [38, 39].

Within RQI, an interdisciplinary team of local and external researchers collects data at the implementation site for a short period of time (approximately 1 week) using multiple methods. For the GC_1000 situational analyses, data were collected using semi-structured interviews and focus groups with providers and recipients of GC and other relevant stakeholders (e.g. policy-makers, community leaders), document analysis and surveys. Iterative adjustment of the data collection strategy occurs in frequent meetings where the collected data are pre-analysed. This procedure enables tailoring of the further data collection (e.g. add questions to topic guide, contact more participants). Research tools and qualitative data analysis will draw on the CFIR [35], allowing for comparison of findings from different sites/countries which will eventually enable the development of blueprints in WP5.

Preliminary findings of the RQIs will be used by WP2 for the development of tailored implementation strategies and adaptations to the GC model. For this purpose, the cultural sensitivity model will be employed [40]. It distinguishes

between surface and deep structure adaptations. Surface adaptation involves matching programme materials and messages to the characteristics of the target populations ensuring cultural sensitivity and responsiveness. Deep structure adaptations stimulate the effectiveness of the intervention by incorporating elements that influence the behaviour of participants in and beneficiaries of the intervention, such as cultural, social and environmental aspects. For the process of adaptation, core questions include when and how to adapt the intervention and which stakeholders to involve in the process [41, 42]. In line with our participatory approach, we will work in close collaboration with women, their partners and families, health care professionals and other stakeholders in the community as well as health systems to adapt GC.

WP3 will lead GC model implementation, incorporating adaptations formulated in WP2. Implementation success will be fostered at the clinic and country level through intensive training and ongoing interactive support for clinic managers, GC coordinators and GC facilitators. Other experiences have shown that GC implementation can be more effective and efficient when interactive support is provided [43]. Interactive support draws on the Model for Improvement [44], hence helping clinics resolve emerging challenges through continuous planning, monitoring, feedback and adaptations.

Direct support to site teams will be provided by a highly experienced team working around the world over time to implement GC. Support includes training health care providers' teams to facilitate groups (rather than provide information in a didactic manner), offer basic clinical care within the group setting and show participants how to take and document their own basic health measurements, such as blood pressure and weight. The WP3 team will offer ongoing communication with trainees to answer questions and strengthen their capacity to hold groups and working with local stakeholders to address health system and other administration barriers and to build sustainable programmes. WP3 will offer tools and support materials that will highlight training content and will allow new GC facilitators to carry out groups using interactive adult-learning based methodologies. WP3 also will assist sites to establish their own Steering Committees, including care-providers, support staff, management and client representatives, and where relevant local policy-makers. The Steering Committee is key to local start up and sustainability as members represent different sectors that can either facilitate or provide barriers to GC implementation and sustainability.

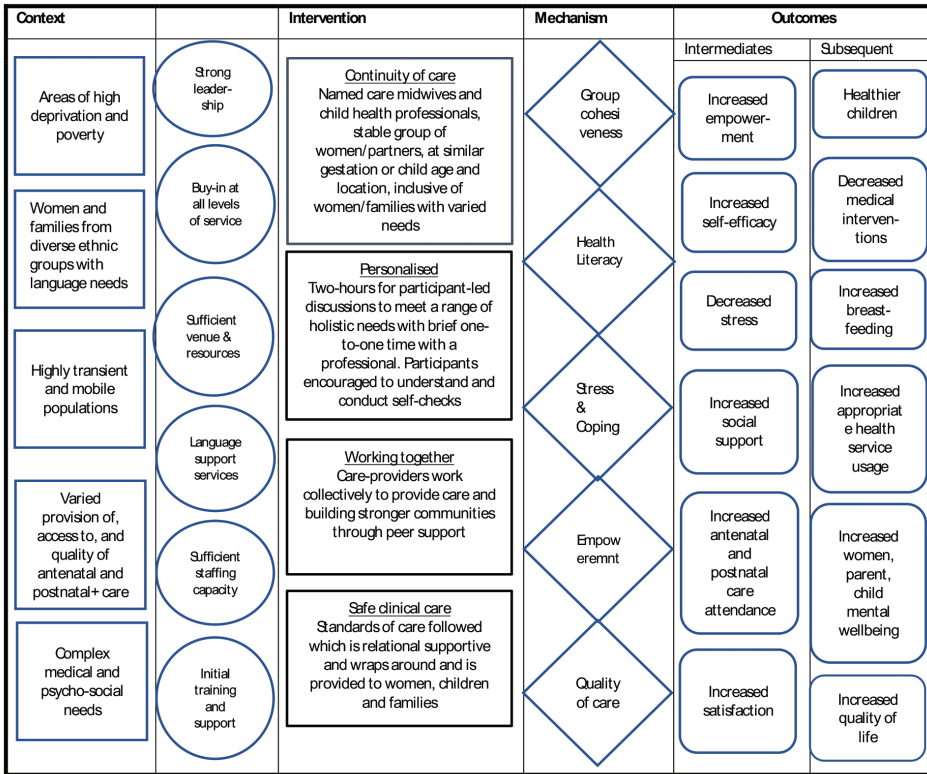


Figure 3. Logic model of Context, Intervention, Mechanism, Outcome propositions for group care

WP4 is responsible for the evaluation of process and cost-effectiveness. The process evaluation will be guided by ‘Realistic Evaluation’ principles [45]. Realist evaluation is a theory-based evaluation approach that takes into account the high level of complexity and the role of context in introducing healthcare programmes into dynamic real-world healthcare systems [46]. Rooted in critical realism, it has an explanatory focus that aims to understand how the implementation of programmes are shaped, enabled and constrained by the interaction between programme elements (e.g. organizational changes or interventions) and mechanisms of effect in a diverse range of contexts. A realist evaluation framework is particularly suitable for the evaluation of complex interventions where it is vital to understand how both the context of implementation and the actors involved (including healthcare providers and users) may influence implementation. Data are gathered across all phases of work and analysis at each stage will be synthesized to develop Context-Intervention-Mechanism-Outcome configurations to understand ‘what works, for whom, and in what circumstances’. Figure 3 describes the logic model of context, intervention, mechanism and outcome propositions that will be examined in this

evaluation. The model is derived from the prior work of (author and colleagues) in development of the Pregnancy Circles trial in the UK [47].

For the evaluation of the overall programme, we will use an interpretative case study design. Based on data collected during the RQI and the development of adaptation and implementation strategies for GC, we will formulate hypotheses for what GC model and implementation strategies may work, for whom, how, in what circumstances. Additionally, implementation processes and participants' experiences will be studied by means of observations, surveys, as well as interviews and focus groups with service users and providers. Using these data on implementation processes and participants' experiences, combined with child and maternal outcome data, we will examine the fidelity and impact of the implementation in the different settings and test the formulated implementation hypotheses.

Process data collection will also include items to enable an estimation of the costs and economic implications of implementing this model in a range of income-level settings as defined by the Organisation for Economic Collaboration and Development (OECD), within varied health systems. Furthermore, an exploratory economic evaluation will be performed in which costs and effects of GC will be compared to usual care using a decision model. Estimates of costs and effects for both forms of prenatal care will be obtained using routine data and data collected by surveys to women receiving GC and women receiving standard care, complemented by information collected in the other WPs, data from literature and expert opinions

WP5 will develop blueprints for scaling-up GC in each setting, as well as an implementation strategy toolbox. A co-creation approach will be used to translate findings to country-specific blue prints for scaling up GC and developing an implementation strategy toolbox. We will use a time-limited participatory process in which people are brought together to collectively produce an outcome, in this case the blue prints and implementation toolbox for GC_1000. We will set-up multi-stakeholder workshops in each participating country and after the implementation process, we will co-create plans focused on scaling-up GC to other sites and nationwide. As no single stakeholder in antenatal and postnatal care has sufficient expertise or perspective to organize the scaling-up of GC, a multi-stakeholder workshop can help them to think along the same lines and develop innovative approaches that can support further dissemination and buy-in from decision makers. Such workshops are also valuable to influence coordination and commitment to scaling-up and it can help with the integration of local or end-user interests and needs into the scaling-up [48].

Each country will set up a country team consisting of researchers and health care providers who will monitor and support the implementation of GC nationwide. National stakeholder engagement groups will be created to guide and advise the country team on implementation and scaling-up of GC. These stakeholder engagement groups may consist of client representatives, care-providers, researchers, health system administrators and policy-makers, amongst others. Lastly, an international advisory board with scientific experts in antenatal and postnatal care, health inequities and implementation research will be asked to provide advice and guidance throughout the project on study design, analyses, findings and resulting implementation products.

Data analysis

Data analyses from all stages will be integrated through interpretive synthesis (WP4). To allow for systematic and consistent identification of the interplay between intervention characteristics and the context in which they are implemented, the basic analytical framework for the realist evaluation analysis will be guided by the CFIR. We will examine which factors of the CFIR may influence the implementation of GC and in turn implementation outcomes, framing this analysis within the Context, Intervention, Mechanism, Outcome (CIMO) configurations characteristic of realist evaluation. Data analysis will initially be inductive but will be mapped to these components and then synthesized with outcome data using CIMO configurations. The data analysis from WP1 will form the basis for the Context component of the realist evaluation, while the analysis from WP2 will form the basis for the Intervention (implementation strategy) and Mechanism components and the analysis from WP4 will synthesize all these elements also in relation to the outcome component of the realist evaluation.

This will allow us to assess what works for whom, in what circumstances. Qualitative data of the WPs will be analysed inductively initially by applying open coding and thematic analysis, using qualitative data analysis software. Following the initial coding and identification of candidate themes, these will be mapped onto the CFIR framework. Any themes that do not fit the CFIR will be identified, and the framework adjusted if appropriate. Quantitative data will be imported into SPSS files. The primary data analysis will be descriptive. Secondary inferential analyses will be conducted to identify possible indicators of impact as follows:

- Pre- and post-implementation routine outcomes data and process data
- Data for those in GC compared with existing local, regional or national data

As it will not be possible to provide matched controls or a controlled comparison group in this study, statistical adjustments may be used to control for any socio-demographic, ethnic or clinical differences between women receiving GC and the local, regional or national reference population.

Research findings from the GC_1000 project will adhere to reporting standards for qualitative research, following the 32-item checklist for interviews and focus groups (COREQ) [49] and the 22-item checklist for reporting observational research (STROBE) [50].

DISCUSSION

GC is an innovative care model to provide antenatal and postnatal+ care holistically, in a group format. Despite promising findings, the GC model has not yet been successfully disseminated and integrated into standard maternal and child health care in settings with relatively high rates of adverse neonatal and maternal outcomes. Disparate factors are likely to influence the implementation of GC in diverse health care systems. Within GC_1000, we will study the implementation of GC systematically, generating evidence that will enhance the current knowledge base about the integration of complex interventions into established health care settings.

Strengths and limitations

A strength of the GC_1000 study design lies in the application of realist evaluation principles. Instead of exclusively focusing on outcomes, this study seeks to explain which implementation mechanisms are at play in what context and why they may interactively lead to certain outcomes. Moreover, the development of research tools is informed by the CFIR and it hence is theory-driven. In this way, GC_1000 contributes to the reduction of the prevailing lack of theory-informed implementation research in maternity care [5, 11].

It is crucial to involve relevant stakeholders in implementation projects from the beginning to adapt interventions and implementation strategies according to their needs. At the core of the GC_1000 design lies a participatory approach where relevant stakeholders are involved and facilitate sustained implementation and scale-up. As such, country teams will document all their activities and discussions as well as relevant developments within the country, adding to the rich variety of data.

A further strength of the study design is triangulation at multiple levels. Methodological triangulation is achieved through the use of qualitative and

quantitative methods to investigate the same phenomenon. Aiming for a rich and broad understanding of implementation processes and outcomes, data will be collected from various sources and respondent categories. The generated data will then be interpreted by our multidisciplinary team of local and external researchers which will shed light from various perspectives on our findings. This integration of emic and etic perspectives is aimed at reducing ethnocentrism as much as possible.

However, our study design is not free from limitations which we aim to counter in various ways. For instance, most measurements will rely upon self-report data which are prone to memory and social desirability biases and the composition of our sample may be affected by selection bias. We hence make use of triangulation to minimize the impact of such biases.

Whereas member checking of findings with interviewees will be limited due to logistical challenges and the large amount of qualitative data that will be generated, summaries of preliminary findings will be discussed within the local research teams. Considering the relatively large number of researchers who will conduct interviews and focus groups, it will also not be possible to acknowledge how researchers influence narratives; thus, reflexivity will be contingent. However, each member of the research team will keep a research diary throughout the process, documenting reflective notes.

As this programme is primarily focused on understanding the implementation process, with adaptations to and led by each local setting, the study does not include a matched or randomized control group. However, where feasible, we intend to include data from comparable settings or from the same sites prior to implementation of GC. Where relevant, statistical adjustments will be used to control for any socio-demographic or clinical differences between women receiving GC and the reference population. The outcome data for those in GC will also be considering within the context of existing local, regional or national data. We consider outcome data as indicators of implementation fidelity and effectiveness, rather than as formal clinical outcome measures, as the study aims are focused primarily on understanding implementation challenges, successes and adaptation to context.

Lastly, the Covid-19 pandemic poses a multitude of challenges to research and implementation processes. As such, our data collection methods, and the GC model itself, might need adaptations. If external researchers may not be able to travel to the implementation sites, online interviews and other virtual data collection

methods need to be employed. Data collection may also rely more heavily on local research teams due to travel restrictions. However, such adaptations depend on the specific situations in each country and situations might vary significantly with regard to coping of the health care system with the pandemic, but also with regard to availability of online research tools.

Implications

GC_1000 findings and tools will be widely disseminated and they have the potential of multi-level impact:

- A better understanding of implementation and scaling-up processes with regard to different contexts and resource requirements
- Information on how to initiate, support and achieve sustainability
- Prevention of adverse health outcomes for mothers and their babies as well as behaviour changes that lead to healthy lifestyle choices and improved health literacy and parenting skills
- Improved satisfaction with care, both on the part of participants and health care facilitators
- Methods to calculate the costs and benefits of the implementation of GC in diverse settings

This 4-year project will generate evidence-based knowledge about the integration of complex interventions in diverse health care systems and also will pave the way for sustained implementation of GC, with special attention to mothers, families and communities who can benefit most.

REFERENCES

1. UN Women – Headquarters. Women and the Sustainable Development Goals (SDGs): SDG 3: Good health and well-being. <https://www.unwomen.org/en/news/in-focus/women-and-the-sdgs/sdg-3-good-health-well-being>.
2. Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization; 2019. Licence: CCBY-NC-SA 3.0 IGO. https://www.unfpa.org/sites/default/files/pub-pdf/Maternal_mortality_report.pdf. <https://www.unfpa.org/featured-publication/trends-maternal-mortality-2000-2017>.
3. de Groot N, Bonsel GJ, Birnie E, Valentine NB. Towards a universal concept of vulnerability: broadening the evidence from the elderly to perinatal health using a Delphi approach. *PLoS One*. 2019;14:1–17.
4. De Jong L, Pavlova M, Winters M, Rechel B. A systematic literature review on the use and outcomes of maternal and child healthcare services by undocumented migrants in Europe. *Eur J Public Health*. 2017;27:990–7.
5. Miller S, et al. Beyond too little, too late and too much, too soon: a pathway towards evidence-based, respectful maternity care worldwide. *Lancet*. 2016;388:2176–92.
6. Say L, et al. Global causes of maternal death: a WHO systematic analysis. *Lancet Glob Heal*. 2014;2:323.
7. WHO. Maternal mortality. <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>.
8. UN IGME. Levels & Trends in Child Mortality: Report 2020, Estimates developed by the United Nations Inter-agency Group for Child Mortality Estimation. (2020).
9. Shonkoff JP, Garner AS. The lifelong effects of early childhood adversity and toxic stress abstract; 2012. <https://doi.org/10.1542/peds.2011-2663>.
10. WHO. Maternal health. <https://www.who.int/health-topics/maternal-health#>.
11. Dadich A, Piper A, Coates D. Implementation science in maternity care: a scoping review. *Implement Sci*. 2021;16:1–20.
12. Bohren MA, et al. Facilitators and barriers to facility-based delivery in low-and middle-income countries: a qualitative evidence synthesis; 2014). <http://www.reproductive-health-journal.com/content/11/1/71>. <https://doi.org/10.1186/1742-4755-11-71>.
13. Rising SS. Centering pregnancy. An interdisciplinary model of empowerment. *J Nurse Midwifery*. 1998;43(1):46–54. [https://doi.org/10.1016/s0091-2182\(97\)00117-1](https://doi.org/10.1016/s0091-2182(97)00117-1).
14. Centering Health Care Institute. Centering Healthcare – A Snapshot The 13 Essential Elements that define the Centering model. (2021). <http://www.amchp.org/Calendar/Conferences/amchp-conference/Handouts2013/Monday/F08EliminatingHealthDisparitiesPart2-1.pdf>.
15. Ickovics JR, et al. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. *Obstet Gynecol*. 2003;102:1051–7.
16. Picklesimer AH, Billings D, Hale N, Blackhurst D, Covington-Kolb S. The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population. *Am J Obstet Gynecol*. 2012;206:415.e1–7.
17. Ickovics JR, Kershaw TS, Westdahl C, Magriples U, Massey Z, Reynolds H, Rising SS. Group prenatal care and perinatal outcomes: a randomized controlled trial. *Obstet Gynecol*. 2007;110(2 Pt 1):330–9. <https://doi.org/10.1097/01.AOG.0000275284.24298.23>. Erratum in: *Obstet Gynecol*. 2007;110(4):937.
18. Cunningham SD, Lewis JB, Shebl FM, Boyd LM, Robinson MA, Grilo SA, Lewis SM, Pruett AL, Ickovics JR. Group Prenatal Care Reduces Risk of Preterm Birth and Low Birth Weight: A Matched Cohort Study. *J Womens Health (Larchmt)*. 2019;28(1):17–22. <https://doi.org/10.1089/jwh.2017.6817>. Epub 2018 Sep 25.

19. Carter EB, et al. Group prenatal care compared with traditional prenatal care: a systematic review and meta-analysis HHS Public Access Author manuscript. *Obs Gynecol.* 2016;128:551–61.
20. Catling CJ, Medley N, Foureur M, Ryan C, Leap N, Teate A, Homer CS. Group versus conventional antenatal care for women. *Cochrane Database Syst Rev.* 2015;2015(2):CD007622. <https://doi.org/10.1002/14651858.CD007622.pub3>.
21. Byerley BM, Haas DM. A systematic overview of the literature regarding group prenatal care for high-risk pregnant women. *BMC Pregnancy Childbirth.* 2017;17(1):329. <https://doi.org/10.1186/s12884-017-1522-2>.
22. Liu Y, Wang Y, Wu Y. Effectiveness of the CenteringPregnancy program on maternal and birth outcomes: a systematic review and meta-analysis. *Int J Nurs Stud.* 2021;120:103981.
23. Hunter LJ, et al. Better together: a qualitative exploration of women's perceptions and experiences of group antenatal care. *Women Birth.* 2019;32:336–45.
24. McNeil DA, et al. A qualitative study of the experience of CenteringPregnancy group prenatal care for physicians. *BMC Pregnancy Childbirth.* 2013;13(1):S6.
25. Baldwin K, Phillips G. Voices along the journey: midwives' perceptions of implementing the CenteringPregnancy model of prenatal care. *J Perinat Educ.* 2011;20:210–7.
26. Lazar J, Boned-Rico L, Olander EK, McCourt C. A systematic review of providers' experiences of facilitating group antenatal care. *Reprod Health.* 2021;18:1–21.
27. Grenier I, L., et al. Transforming women's and providers' experience of care for improved outcomes: a theory of change for group antenatal care in Kenya and Nigeria; 2022. <https://doi.org/10.1371/journal.pone.0265174>.
28. Rowley RA, et al. Group prenatal care: a financial perspective. *Matern Child Health J.* 2016;20:1–10.
29. Gareau S, et al. Group prenatal care results in Medicaid savings with better outcomes: a propensity score analysis of CenteringPregnancy participation in South Carolina. *Matern Child Health J.* 2016;20:1384–93.
30. Patil CL, et al. Implementation challenges and outcomes of a randomized controlled pilot study of a group prenatal care model in Malawi and Tanzania. *Int J Gynecol Obs.* 2017;139:290–6.
31. Peters DH, Adam T, Alonge O, Agyepong IA, Tran N. Republished research: Implementation research: what it is and how to do it. *Br J Sports Med.* 2014;48:731–6.
32. Durlak JA, DuPre EP. Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am J Community Psychol.* 2008;41:327–50.
33. Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge translation of research findings. *Implement Sci.* 2012;7:1.
34. Brakema EA, Vermond D, Pinnock H, Lionis C, Kirenga B, An PL, Sooronbaev T, Chavannes NH, van der Kleij MJJR. FRESH AIR collaborators. Implementing lung health interventions in low- and middle-income countries: a FRESH AIR systematic review and meta-synthesis. *Eur Respir J.* 2020;56(1):2000127. <https://doi.org/10.1183/13993003.00127-2020>.
35. Damschroder LJ, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4:1–15.
36. Nilsen P, Bernhardtsson S. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Serv Res.* 2019;19:1–21.
37. Daivadanam MI, et al. The role of context in implementation research for non-communicable diseases: answering the 'how-to' dilemma behalf of the GACD Concepts and Contexts working group. Rianne van der Kleij, vol. 17.

38. Beebe J. Basic concepts and techniques of rapid appraisal. *Hum Organ.* 1995;54:42–51.
39. Beebe J. *Rapid qualitative inquiry: a field guide to team-based assessment*: (Rowman and Littlefield; 2014).
40. Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. Cultural sensitivity in public health: defined and demystified. *Ethn Dis.* 1999;9:10–21.
41. Cabassa LJ, Baumann AA. A two-way street: bridging implementation science and cultural adaptations of mental health treatments. *Implement Sci.* 2013;8:90.
42. Barrera M, Berkel C, Castro FG. Directions for the advancement of culturally adapted preventive interventions: local adaptations, engagement, and sustainability. *Prev Sci.* 2017;18:640–8.
43. Wandersman A, Chien VH, Katz J. Toward an evidence-based system for innovation support for implementing innovations with quality: tools, training, technical assistance, and quality assurance/quality improvement. *Am J Community Psychol.* 2012;50:445–59.
44. Langley GJ, Moen RD, Nolan KM, Nolan TW, Norman CL, Provost LP. *The improvement guide: a practical approach to enhancing organizational performance*: (Jossey-Bass Publishers; 2009).
45. Salter KL, Kothari A. Using realist evaluation to open the black box of knowledge translation: a state-of-the-art review. *Implementation Sci.* 2014;9:115. <https://doi.org/10.1186/s13012-014-0115-y>.
46. Pawson R. *The science of evaluation: a realist manifesto*: (SAGE Publications Ltd; 2014). <https://doi.org/10.4135/9781473913820>.
47. Wiggins, M. et al. Group antenatal care (Pregnancy Circles) for diverse and disadvantaged women: study protocol for a randomised controlled trial with integral process and economic evaluations. doi:<https://doi.org/10.1186/s12913-020-05751-z>.
48. Dexis Consulting Group & USAID. *Evidence base for collaborating, learning, and adapting*. (2016).
49. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Heal Care.* 2007;19:349–57.
50. Abeysena C. Strengthening the reporting of observational studies in epidemiology (STROBE) statement: New guidelines for reporting observational studies. *J Coll Comm Physicians oSri Lanka.* 2008;13:www.strobe-statement.org.



CHAPTER 3

Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector

a contextual analysis

Published as

Martens, N., Hindori-Mohangoo, A.D., Hindori, M.P. et al. Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis. BMC Pregnancy Childbirth 23, 592 (2023). <https://doi.org/10.1186/s12884-023-05904-y>

ABSTRACT

Background

Suriname is a upper middle-income country with a relatively high prevalence of preventable pregnancy complications. Access to and usage of high-quality maternity care services are lacking. The implementation of group care (GC) may yield maternal and child health improvements. However, before introducing a complex intervention it is pivotal to develop an understanding of the local context to inform the implementation process.

Methods

A context analysis was conducted to identify local needs toward maternity and postnatal care services, and to assess contextual factor relevant to implementability of GC. During a Rapid Qualitative Inquiry, 63 online and face-to-face semi-structured interviews were held with parents, community members, on-and off-site healthcare professionals, policy makers, and one focus group with parents was conducted. Audio recordings were transcribed in verbatim and analysed using thematic analysis and Framework Method. The Consolidated Framework for Implementation Research served as a base for the coding tree, which was complemented with inductively derived codes.

Results

Ten themes related to implementability, one theme related to sustainability, and seven themes related to reaching and participation of the target population in GC were identified. Factors related to health care professionals (e.g., workload, compatibility, ownership, role clarity), to GC, to recipients and to planning impact the implementability of GC, while sustainability is in particular hampered by sparse financial and human resources. Reach affects both implementability and sustainability. Yet, outer setting and attitudinal barriers of health professionals will likely affect reach.

Conclusions

Multi-layered contextual factors impact not only implementability and sustainability of GC, but also reach of parents. We advise future researchers and implementors of GC to investigate not only determinants for implementability and sustainability, but also those factors that may hamper, or facilitate up-take. Practical, attitudinal and cultural barriers to GC participation need to be examined. Themes identified in this study will inspire the development of adaptations and implementation strategies at a later stage.

BACKGROUND

Antenatal care (ANC) and postnatal care (PNC) are important pillars and indicators of public health. Traditionally ANC and PNC are delivered on a one-on-one basis. In contrast, group care (GC) is an innovative approach in which (expecting) mothers/couples (and infants in PNC) come together for up to ten two-hour sessions consisting of: 1) a health assessment conducted by health care professionals (HCPs), 2) self-assessments conducted by parents and 3) group discussions facilitated by HCPs [1, 2]. GC may enhance the parent-provider relationship, improve health behaviours and foster social support from peers [3]. Moreover, evidence points to promising effects on birth weight and preterm birth rates [4,5,6,7,8]. Due to the reported benefits and aiming to improve utilization and quality of ANC, the World Health Organization (WHO) recommends to broaden the implementation of GC globally [9].

Implementation refers to the extent to which an intervention is put into practice as intended [10, 11]. Various aspects of implementation can be distinguished and evaluated after, or prior to the introduction of an innovation. For instance, implementation delivery can be evaluated after the innovation is put into practice, whereas contextual factors can be explored to assess implementability—the likelihood that an innovation will be delivered—before introducing it in a new context [11].

The concept of context encompasses more than merely the setting. Context is the multi-layered set of dynamic characteristics and circumstances influencing implementation [10]. Complex interventions, such as GC, are prone to implementation failure when transferred to another context. If implementation fails, potential health benefits may not be attained rendering allocated resources futile [11,12,13]. Therefore, prior to implementing GC in different contexts, implementability should be examined through context analyses [14]. The Consolidated Framework for Implementation Research (CFIR) [15, 16] is frequently used to systematically study implementation determinants [17]. This theoretical framework comprises five domains, namely outer setting and inner setting in which the intervention is implemented, intervention, individuals involved in the implementation and the implementation process.

Insights gained from context analyses can inform intervention adaptations and implementation strategies that fit local needs, ultimately fostering implementation success [17, 18]. Context analysis, however, is often omitted due to limited resources and lack of methodological guidance [17]. Amongst others, these factors might also

explain why implementation science is neglected in the field of maternity care research, yet much needed, [19] especially in low and-middle income countries with high Maternal Mortality Ratios (MMRs).

Suriname, a former colony of the Netherlands, is an upper-middle-income country in South-America with a population of about 583,000 inhabitants and a MMR that has plateaued over the last ten years at an average of 130 maternal deaths per 100,000 births, of which ca. 50% are preventable [20]. Primary health care is delivered by three different health care providers. The Regional Health Service (RGD) is a governmental institution with ca 60 clinics in the coastal area. Usually, the RGD team consists of several nurses, midwives and general practitioner (GPs). A GP is the head of the clinic. Next to RGD clinics, private GPs operate in the coastal area, whereas the Medical Mission Primary Health Care Suriname (MMPHCS), a semi-governmental health care provider, operates exclusively in remote areas in the hinterlands. ANC in Suriname is based on WHO guidelines of minimal eight visits, preferably to start during first trimester of pregnancy, followed by two visits during the second trimester and five visits during the third trimester when no pregnancy complications occur. Although the Surinamese health care system officially follows the WHO guidelines, only 44.1–57.9% of pregnant women have at least eight ANC visits [21]. Only 56% of pregnant women had an ANC visit during the first trimester and thirteen percent of women delivering received no ANC [21]. Delayed ANC and increased risk of obstetric complications are linked to barriers in obtaining a health insurance cards [21, 22].

ANC is mainly provided in primary health clinics by midwives and GPs from the RGD or by private GPs, and in the interior by skilled health care workers under supervision of remote doctors in the capital city Paramaribo. Pregnant women with complications and those who plan to give birth at the hospital (the latter around week 32) are referred to gynaecologists or midwives at the hospitals. Almost all births in Suriname are supervised by a skilled HCP. Around ninety percent of births are hospital-based under supervision of a midwife or gynaecologist [21]. The remaining births take place under the supervision of a midwife or general practitioner at the RGD or supervised by a skilled healthcare worker at MMPHCS. Less than one percentage of births occur at home or elsewhere (e.g., during transport) without supervision of a HCP [21].

In 2014, three hospitals in Paramaribo introduced the GC model *SamenZwanger* as part of the Perinatal Interventions Suriname project funded by the Ministry of Foreign Affairs of the Netherlands through the Twinning Facility Suriname

Netherlands [23]. After the project period SamenZwanger was continued in one hospital by the Foundation for Perinatal Interventions and Research in Suriname (Perisur); ten groups were conducted during the period 2017–2019. From 2019, SamenZwanger was continued in the hospital setting with payment from the participants. In an approach to make SamenZwanger sustainable and reach vulnerable women from deprived areas, midwives from the RGD were trained to facilitate GC in 2019 with funding from the Pan American Health Organization. In February 2020, the first RGD clinic implemented SamenZwanger at RGD Santodorp and in March two more clinics (Geyersvlijt and Latour) followed. Due to the Covid-pandemic all groups stopped, and no group sessions were organized during 2020–2022.

The Committee for Maternal Mortality Suriname (MaMS), recommends a multitude of measures to lower the MMR, including assessment of family and community care needs, preventative programs targeting vulnerable groups, and psycho-social support during and after pregnancy [20]. In line with the MaMS' recommendations, GC will be implemented in four primary care settings located in disadvantaged suburban areas surrounding Paramaribo, the capital city of Suriname. A context analysis was conducted to identify local needs, gain insight into the standard maternity care services, and to assess implementation barriers and facilitators in the settings that were selected as pilot sites. The CFIR guided the context analysis [15, 16].

This context analysis seeks to answer two research questions: (1) What is the current situation of maternity care in Suriname, and (2) What are the contextual factors relevant to the (continued) implementability of GC in Suriname?

METHODS

Study design and setting

This study is part of the Horizon2020 project Group Care during the first 1000 days (GC_1000) [24]. GC_1000 aims to implement and scale-up contextually sensitive formats of GC in seven countries and to evaluate implementation processes. Prior to the introduction of GC in the selected settings, a Rapid Qualitative Inquiry (RQI) was conducted in order to study contextual factors relevant to the implementability of GC. Approval from the director of Ministry of Health in Suriname was attained on 26th of January 2021.

Suriname can be divided into three distinct areas, based on geographic, socio-economic, and cultural characteristics: the urban coastal area, the rural coastal



area, and the rural interior [25]. Two-third of the Suriname population (66%) is concentrated in the two largest, mainly urban districts: the capital Paramaribo and Wanica. The primary economic focus is on trade and small industries, and companies engaged in food production and processing, and other products for the domestic market [25]. The largest ethnic groups are Creoles and Hindustanis [25]. Four RGD clinics in the urban districts capital Paramaribo and Wanica were selected as pilot sites by an implementation team from the RGD and Perisur. Selection criteria included a suitable space for the group care sessions, at least two midwives working at the sites for GANC and at least two nurses and at least two doctors for the sites for postnatal GC, number of women receiving ANC and mothers/babies receiving PNC large enough to create groups for ANC and PNC.

Participants and sampling

Purposive sampling as described by Tongco [26] was employed with reliance on the Perisur network in order to recruit respondents from the outer context (policy makers/advisors, external healthcare professionals and NGO employee), whereas on-site HCPs, recipients and community members were purposively sampled at, or via the implementation sites. Women who participated during 2017–2020 in the SamenZwanger groups were invited to participate in a focus group discussion. All respondents were informed about the GC_1000 study and if they consented to participate in writing or verbally, an interview was scheduled.

Data collection

An Rapid Qualitative Inquiry (RQI) took place in March and April 2021. RQI is a time and cost-effective, team-based technique that focuses on insiders' perspectives and uses triangulation and iterative data analysis to gain preliminary understandings of complex situations [27]. In collaboration with local researchers 64 online and face-to-face semi-structured interviews were conducted with care recipients, community members, on-site healthcare professionals (HCPs), policy makers/advisors, external healthcare professionals and one NGO employee, and one online focus group with recipients. While Surinamese researchers conducted face-to-face interviews, the external researchers from the Netherlands and Belgium were not able to travel due to covid restrictions and therefore they interviewed respondents online. The CFIR guided the development of three generic interview guides for (1) recipients, (2) HCPs, and (3) other stakeholders (see appendix 1–3 and Table 1), which were pre-tested and used for preceding RQIs in other countries that participate in GC_1000 (namely Belgium, The Netherlands, Kosovo, The United Kingdom, South Africa and Ghana). Semi-structured interview guides consisted of two parts. In the first part of the interview the current situation of maternity

care and characteristics and needs of the target population were explored. For example, HCPs were asked Can you describe the care trajectory for a pregnant woman? and recipients Can you describe your experience with antenatal care?. Subsequently, a four-minute video introduced GC, followed by questions on the perceptions of GC and its implementability, such as What do you think about this form of care? and How can successful implementation be ensured? What do you need? (see Appendix 1–3). In contrast, the focus group guide was not divided in two sections and no explanatory video was used as respondents had participated in GC previously. The focus group was conducted in Dutch language and it took 120 min. The length of the interviews ranged from 15–100 min with a mean of 42 min and standard deviation of (SD) of 17 min. The majority of interviews were in Dutch (n = 57); four were in English and two in Sranan Tongo. Flexibility with regards to usage of interview guides and tailoring of questions to the experience, or expertise of interviewees was encouraged. During daily debriefings attended by local and external researchers the findings were pre-analyzed and further data collection needs/data saturation were discussed [26].

Data analysis

All data sources were used to answer our two research questions. Audio recordings of interviews and the focus group were transcribed in verbatim and analyzed using thematic analysis [28]. The CFIR [3] served as a base for the coding tree and it was complemented with inductively derived codes. Constructs from all five CFIR domains served as codes and were later grouped into themes using the Framework Method [29]. Matrices where rows correspond to respondents and columns to codes allowed for reduction of data and comparison of what was said by whom. This facilitated the grouping of multiple codes into fewer overarching themes. To illustrate, the codes 'GC format and outcome expectancy', 'content' and 'group composition' merged into the sub-theme 'innovation', which in turn forms part of the theme 'implementability'. Coding was performed with Atlas.ti 22 software by NM. Inter-coder reliability was not sought as such quality insurance measures do not correspond to our epistemological understanding of qualitative research [28, 30, 31]. However, reflexivity and the interpretation of data were constantly discussed within the diverse research team [31] to ensure trustworthiness of results [31].

RESULTS

Basic characteristics of the study participants

Table 1 provides definitions of the respondent categories and number of respondents per data collection method.

Table 1. Respondents

Category	Number	Description	Age (in years)	Gender	
				Male	Female
Recipients	34	FGD with SamenZwanger participants	range 18–48	0	7
		Pregnant women/mothers and partners/fathers ($n=9$)	mean 30; SD 8	8	19
Community members	6	Prominent members of the communities surrounding implementation sites	not recorded	4	2
On-site HCPs	16	GPs ($n=4$), midwives ($n=7$), and nurses ($n=5$) at the four implementation sites	not recorded	4	12
Policy makers/advisors	4	Policy makers and advisors in the health care sector	not recorded	1	3
HCPs	11	HCP professionals in Suriname who are not directly involved in GC_1000. Mainly GPs, specialized doctors (gynaecologist, pediatrician), and midwives (one with SamenZwanger experience)	not recorded	4	7
NGO employee	1	NGO focused on sexual and reproductive health	not recorded	0	1
Total	72			21	51

Contextual information on the current situation of maternity is provided below. Moreover, ten themes related to implementability, one theme related to sustainability, and seven themes related to reaching and participation of the target population in GC (i.e., pregnant women/couples and young parents) were identified. Whereas some themes and sub-themes can be directly linked to the CFIR (e.g., implementability, innovation design), others were inductively derived (e.g., reach, perceived necessity).

Current maternity care

For women without pregnancy complications, ANC is provided at the RGD until ca. week 30 when they are referred to secondary care. The large majority of women give birth at the hospital, although delivery at the RGD is possible for low-risk multiparous women. Well-baby clinics, or Consultatie bureau (CB), are financed by the government and they are part of the RGD and MMPHCS.

A gap in health care usage/delivery in the first days and weeks postnatally was identified based on responses from multiple recipients, HCPs and on-site HCPs. RGD staff do not know when women deliver at the hospital and when they return to their homes. Therefore, midwives do not visit these mothers at home and for many the first contact postnatally with the health care system is for their child's first vaccination (at eight weeks). HCPs explained that CB largely focuses on the infant, and a policy advisor stressed the need to monitor women's health more closely postpartum. Moreover, several HCPs lamented that during CB consultations, the infants' physical health is attended to exclusively, while the cognitive, emotional and social developmental assessments are neglected. Using the Bayley test [32] was suggested, an instrument to assess the motor skills, cognitive, language, and socio-emotional and behavioural development of babies.

"So because, for example, an RGD midwife does home visits after the birth. But only to the people who gave birth with them. So if a woman gives birth in 's Lands Hospital, the midwife of the RGD clinic where she lives will not visit her at home. She only goes to those women who give birth there."

Paternal role

Respondents across categories explained that involvement of fathers in ANC and PNC remains low despite a noticeable increase. Interviewees argued that a hypermasculine culture, work obligations and marital conflict can explain the fathers' absence. Low SES, being from the interior and young maternal age were also linked to absence of fathers. Care recipients and on-site HCPs thought that fathers should be encouraged to accompany mothers to health care appointments. However, one HCP pointed out that it was important to also consider other support people (such as mothers and aunts) in view of the typically variable family constellations in Suriname.

In Table 2 contextual factors relevant to implementability, sustainability and reach are summarized.



Table 2. Implementability, sustainability and anticipated reach

Themes	Sub-themes
Implementability	<p>Innovation</p> <p>GC format and outcome expectancy. Several HCPs expected improved pregnancy outcomes and a lower perinatal mortality</p> <p>Content. Different views on herbal medicine and traditional remedies may surface during GC discussions</p> <p>Group composition. Ambivalence regarding diversity with regard to SES, ethnicity and inclusion of fathers</p> <p>Multi-sectorial approach. As determinants of neonatal and maternal health are diverse, a multi-sectorial approach is needed</p> <p>Recipients</p> <p>Self-efficacy. Self-efficacy to conduct self-assessments of some recipients is low and HCPs are ambivalent about self-assessments</p> <p>HCPs</p> <p>Staff shortage and high workload. Staff shortage and high workload prevail in the health care sector</p> <p>Compatibility with working routine and motivation. Despite eagerness to start GC, on-site HCPs were uncertain about time-effectiveness of GC and compatibility with their working routine</p> <p>Buy-in and ownership. Buy-in from RGD managers, RGD HCPs and other professionals in the field was high</p> <p>Role clarity. Roles of different professionals involved in the GC project are not clearly defined</p> <p>Planning</p> <p>Planning and logistics. It is unclear when and where GC session will take place</p>
Sustainability	<p>Economic situation. Sparse resources are allocated to curative and not to preventative care</p>
Reach	<p>Outer setting</p> <p>Competing demands. Many parents in the sub-urbs of Paramaribo experience economic stress and difficulties with their health insurance</p> <p>(Care) infrastructure. Disparate access to care, esp. disadvantageous in the interior</p> <p>Social environment. Romantic/family relationships and power dynamics are complex and gender inequality prevails</p> <p>Acceptability</p> <p>Cultural sensitivity. Cultural traditions and beliefs differ between the various regions and ethnic groups, and they may interfere with health seeking behaviours</p> <p>Perceived necessity of care. Preventative care is frequently not considered necessary</p> <p>Marketing and communication. Some recipients thought that GC targets couples of high SES</p> <p>Privacy, confidentiality and trust. Implementation sites are nested in a tightly-knit communities where fear of judgement is high</p>

Implementability

The sub-themes below were found to be related to the implementability of GC and as outlined in Fig. 1 they can be grouped into sub-themes that evolve around the innovation, the recipients, HCPs and around the planning of GC.

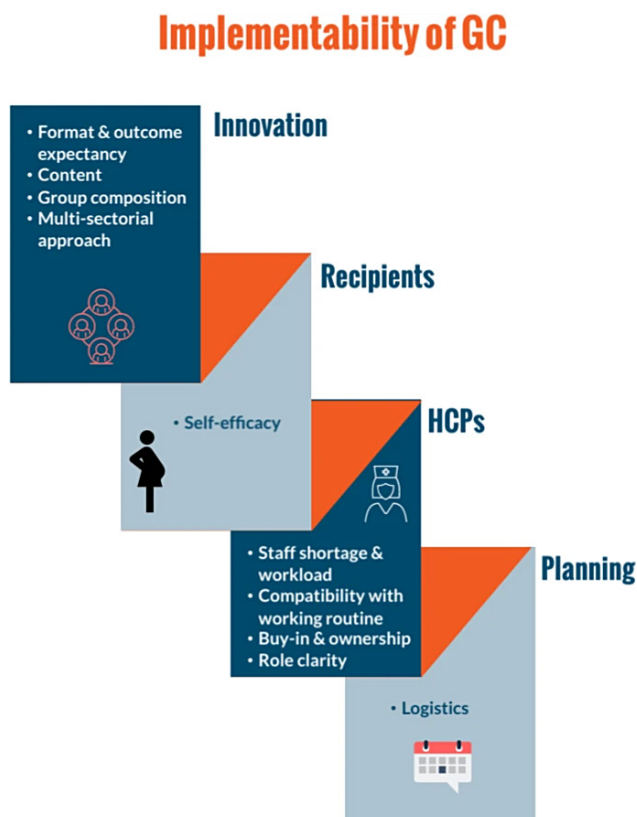


Figure 1. Implementability of GC

Implementability: innovation determinants

GC format and outcome expectancy

The overall perception of GC was positive across respondent categories. Educational and social aspects of the model were most frequently mentioned as potential implementation benefits. Policy makers, RGD managers and HCPs expected that implementing GC would improve parents' health behaviours and enable the recognition of alarm signals for medical complications. Several HCPs expected improved pregnancy outcomes and a lower perinatal mortality as a result of the implementation of GC. One HCP adopted a more critical stance stating that GC will not solve the bigger socio-economic problems which are at the root of ill-health.

The most salient advantage of GC named was increased information on pregnancy and parenting for recipients. Some recipients viewed GC as a recreational activity that can potentially offer relaxation, that can be “gezellig” (cosy, social), and that can enhance the relationship between both parents. One woman expressed concerns towards implementability: she stated that receiving bad news (e.g., miscarriage or disease) may be experienced more severely when in a group.

Content

To improve implementability of GC, parents suggested to discuss topics such as the developmental stages of their babies, nutrition of mother and child (including breastfeeding), family planning, unintended pregnancies, sex post-partum, mental health and self-care and practical issues. However, one woman anticipated that discussing traditional remedies with HCPs could be challenging due to conflicting views. In contrast, a RGD manager who used to work as HCP considered it crucial to discuss safe use of herbal medicine with particular attention for potentially harmful practices, such as hot steam baths that hamper wound healing, or eating pimba (white clay). On-site HCPs considered it particularly important to discuss breastfeeding and nutrition of mother and child. The majority of topics suggested by on-site HCPs would prepare parents for the postnatal period: arranging support for the first weeks postpartum, postnatal pain management, postnatal depression and caring for a new-born (e.g., naval care, constipation). External HCPs and policy makers emphasized the need to teach parents how to recognise alarm signals, so that calamities can be prevented. Additionally, HCPs suggested to pay more attention to hygiene, parenting skills, psychological and social needs of parents. Moreover, unintended pregnancies – frequently at a young age – appear to be very common. Hence, elaborate discussion of family planning during GC is warranted.

“There really are women who say I didn’t know I had to come; they come with terribly swollen legs and a headache and they are already in, almost in a pre-eclamptic seizure. But they just don’t sense they should come or ring the alarm. So they need to get all that kind of information, they need to be made aware.” Interview with HCP.

Group composition

Most recipients and HCPs thought that it is beneficial for fathers to join GC. However, a few women acknowledged that it would be easier to talk openly in the absence of men, enhancing implementability of GC. Several HCPs shared that concern. With regard to group composition in terms of age, SES and culture, community members and interviewed professionals were ambivalent. While

they advocated for diversity, they also suggested that it would be challenging to implement groups where parents from the city and from the interior mix, and that it was important to keep 'some sort of homogeneity'.

Multi-sectorial approach

Policy makers and HCPs emphasized that the diversity of determinants for neonatal and maternal health warrants a multi-sectorial approach. Numerous stakeholders that should be involved in the implementation of GC were named (e.g., Ministry of Health, Ministry of Social Affairs, Bureau voor Openbare Gezondheidszorg (BOG; public health office), Pan American Health Organization (PAHO), pediatricians, gynecologists, GPs, organization of midwives, social workers, psychologists), yet how these stakeholders should be involved remained unclear.

Implementability: recipients determinants

Self-efficacy

Recipients believed that they could learn how to measure their own blood pressure, or their baby's weight if well instructed, except for one woman who expressed low self-efficacy. She preferred the implementation of a GC model where HCPs are charge of all health assessments as she does not trust her own capabilities.

Implementability: HCPs determinants

Staff shortage and workload

At least one HCP at every implementation site and several HCPs from hospital settings mentioned that high workload and/or shortage of staff may affect the implementation of GC. A nurse from one of the implementation settings explained that sufficient staff needs to be available so that continuity is ensured also when one of the facilitators is sick, or on vacation.

Compatibility with working routine

On-site HCPs reflected on the potential impact the implementation of GC will have on their working routine. While one midwife expected a manageable increase of workload, other HCPs thought that the GC model is a more efficient way of working. They hypothesized that time can be saved when a group of parents receive information at once and that women might reach out to peers first before asking advice from HCPs.



Most on-site HCPs were eager to start the implementation of GC and were confident that it will be a success. However, one on-site GP doubted if GC will succeed in this environment due to the barriers to participation mentioned below. Concerns regarding sustainability were also raised by on-site staff; they do not wish to invest efforts in a temporary project but rather they aim to implement a different model of care that is sustained long-term.

Buy-in and ownership

On-site HCPs explained that buy-in from on-site RGD staff, including midwives, nurses and doctors was pivotal to implement GC but that the RGD management needs to be onboard, too. In fact, an implementation committee that includes RGD managers was already set up at the time of data collection. One midwife suggested that members from the RGD management should follow the GC training as this would increase understanding and support. While guidance from facilitators of the previous SamenZwanger pilot was welcome, a need for ownership was also voiced. A midwife explained: “I also want to make it my own.”

Role clarity

On-site HCPs were of the opinion that midwives are best suited to facilitate antenatal GC. However, nurses also demonstrated willingness to co-facilitate GC, whereas GPs expected less direct involvement and the assumption of an advisory role. One of the interviewed GPs admitted that he was shy and rather uncomfortable with the idea of facilitating group sessions. Health care coordinators, RGD management and external HCPs voiced a need to clarify roles and tasks within the GC_1000 project to strengthen implementability.

Implementability: planning determinants

Planning and logistics

For recipients it was crucial that dates are communicated in advance and that timing of GC sessions does not collide with work/school schedules. Community members added that many recipients attend church service on Sundays, rendering this an unsuitable time for GC sessions. A GP suggested to hold GC sessions during the weekend so that midwives would not neglect other duties. However, a midwife from the same setting reflected that good working conditions (such as flexibility regarding working hours, availability of material and space) are crucial for the implementation of GC and that conflict regarding working hours hindered the implementation of GC in a previous pilot. While some HCPs advised to organize GC during the midwives' regular working time to minimize costs, another GP was of the opinion that no extra compensation for midwives was needed if GC was

organised outside their regular work schedule because midwives would acquire new transferable skills through participation in this project. The timing of GC sessions is further complicated as a sufficiently spacious room in one setting is only available in the afternoons, when the clinic is more quiet. Furthermore, a policy maker suggested that the number of women that receive ANC at each RGD setting would be too small to form groups and hence several RGD clinics would have to liaise for recruitment.

Sustainability

Economic situation

Two policy makers from the Ministry of Health and the Staatsziekenfonds (SZF; State Health Insurance), Suriname's largest health insurance, stated that in the currently strained economic situation, resources are sparse and hardly sufficient for curative care. All policy makers acknowledged that investments in preventative care are currently minimized and funding of GC through the SZF was ruled out. The respondent from the Ministry of Health explained that a sound budgeting plan is needed and effects on mortality and cost-effectiveness need to be demonstrated based on local data if the government was to support the implementation of GC. External HCPs doubted health insurances' willingness to reimburse GC, and they also emphasised the need for a budgeting plan and scientific evidence.

"I want to be convinced about the benefits. Because the moment I will have to spend money on it I want to see the benefits clearly otherwise I can spend the money in another way to have more benefits from the health sector. That is an honest answer." Interview with a policy maker.

On-site HCPs regarded lack of funding as the main implementation barrier and many HCPs reflected on the GC fee pregnant women/couples from two groups had to pay in the previous SamenZwanger project which led to restriction of women/couples who could afford it.

Reach

Below sub-themes are related to reaching and participation of the target population. Whereas some sub-themes describe barriers linked to the outer setting which hamper access to health care services in general, others evolve around willingness to participate in GC (see Fig. 2).



Reach

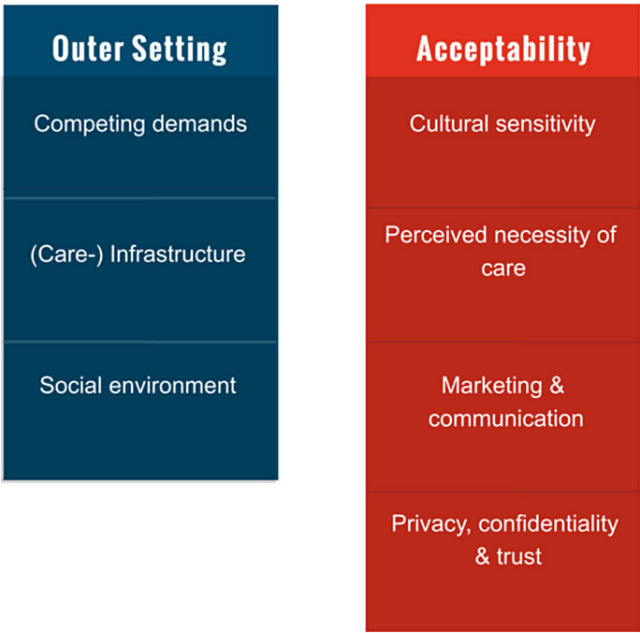


Figure 2. Factors that determine reach of the target population

Reach: outer setting

Competing demands

Several parents, HCPs, and on-site HCPs reported long waiting periods after application for new health insurance cards. Without health insurance card, recipients need to pay for health care services, which many cannot afford. Multiple service-users denounced high costs for health care services and medication. Moreover, parents with economic stress are unlikely to prioritize GC when the time allocated to it could be used to generate income instead.

“(…) someone who is struggling or stressed because she needs income will find it difficult to make time to come and do this [GC]. She prefers to think what she can do to get bread or food.” Interview with community member.

(Care) infrastructure

Recipients, on-site HCPs and community members explained that poor infrastructure and long distances to health care facilities can be obstacles to seeking health care. Policy makers and HCPs pointed out that disparate access to

health care is problematic. Women who live in the interior of Suriname frequently do not receive ANC at all, or they receive ANC from health assistants from the MMPHCS who are less trained in maternity care. Some women refuse referral to specialized care due to long distances. Lack of childcare is another barrier to attending ANC and PNC that was mentioned across respondent groups.

Social environment

Many respondents across categories speculated that partners and other family members may not permit women to attend GC. Recipients reasoned that disapproval from the social environment can stem from jealousy, or unwillingness to disclose private information. Moreover, reluctance towards novelty in general, including towards novel health interventions was mentioned in many interviews. The idea that a strained parental relationship can hamper GC attendance surfaced across respondent categories. Also, extramarital relations, multi-partnering and diversity in partner relations and.

family forms are not uncommon in Suriname and fathers may not want to be seen at GC with one of multiple partners, explained HCPs. Furthermore, groups where two women are pregnant of the same man can potentially lead to tensions.

Reach: acceptability

Cultural sensitivity

In Suriname pregnancies are often kept a secret (out of fear that others can negatively influence the health of mother and child). Interestingly, policy makers and HCPs thought that women may not want to join GC because of unwillingness to disclose their pregnancy, whereas women, their partners and community members did not mention it as a potential barrier. However, community members and recipients thought that some women may not be eager to participate in GC due to shame, embarrassment, or shyness. These attributes were frequently associated with origins from the interior of Suriname and low SES. Moreover, a policy maker thought that the cultural proscription for women to not leave their home for up to six weeks postpartum can interfere with GC attendance after birth.

Some women who live in remote areas of Suriname refuse to travel to Paramaribo to seek appropriate health care as they believe that they will lose their strong bond with nature in the city and get sick. As the various Surinamese regions are marked by ethnic and cultural diversity, GC facilitators should be familiar with the dominant local culture(s) and involve community members already in the planning phase, suggested a policy advisor.



“Then you have to be careful, especially here in Suriname certain people are very sensitive when it comes to cultural matters, they feel easily stepped on the toes.” Interview with HCP.

Perceived necessity of care

Recipients and community members explained that preventative care is frequently not considered necessary. Some multiparas think that they can rely on their previous experience and hence they regard ANC as futile. HCPs explained that mothers, aunts and female neighbours support women during pregnancy and give them advice. However, they also mentioned that their advice can be wrong and that the use of herbal medicine can prevent women from seeking professional health care. A recipient added that some parents are afraid of being criticised by HCPs.

“At the outpatient clinic, the woman received instructions, but when she went back to her community she received other instructions, often wrong instructions. (...) If our pregnant women have a headache, it's not that they watched too much television or that they yelled at their children too much. There may be something seriously wrong.” Interview with HCP.

Interview data across respondent categories indicates that sparse and late ANC attendance is common due to aforementioned practical barriers. Other reasons include not being aware of the pregnancy and cultural beliefs and practices.

“Sometimes traditional practices make that women actually ask for help too late. For example in the Maroon community there is great resistance to caesarean sections, so if they hear that the child will have to be delivered with a caesarean section, they will first go looking for alternative solutions within their own community.” Policy maker.

Marketing and communication

Recipients understood that GC is targeted at both parents and they speculated that single mothers and women with unintended pregnancies (especially teenage mothers) may feel excluded, or uncomfortable to attend. Recipients also explained that parents of lower SES may think that GC is aimed at parents of high SES. Moreover, interviewees from all respondent groups proposed to raise awareness of GC with a campaign using traditional and social media as well as religious leaders.

Privacy, confidentiality and trust

Respondents from all categories indicated that diminished privacy in GC will likely be a concern for recipients. Several HCPs rationalised that Suriname is a 'small community' and that therefore fear of judgement is high. While most recipients declared openness to sharing their experiences, they were also reluctant to discuss more private topics, such as marital conflict, miscarriages, mental health and sex during pregnancy. HCPs added that abnormal child development and domestic violence will likely be difficult to discuss in a group. Several respondents suggested that a safe environment facilitating open group discussions could be created by both facilitators and group members practicing self-disclosure and humour. HCPs also suggested to discuss all topics in a generalized manner and not at a personal level in order to ensure privacy and confidentiality.

"I have to say that in Suriname we are quite suspicious of information that others want to hear from us and that we need to share." Interview with HCP.

In order to protect service-users' privacy, it was advised to clarify during the intake what kind of information will be shared during GC sessions. One policy maker highlighted the need for facilitators to ask for permission prior to sharing any personal, or medical information with the group. On-site HCPs concluded that for privacy reasons it is important to host GC in a closed room and to continue offering one-on-one appointments next to GC sessions.

DISCUSSION

Findings of this context analysis describe factors that warrant adaptations to the GC model and the development of tailored implementation strategies prior to implementing GC in Suriname. Factors related to HCPs, to the innovation (GC), to recipients and to the organization impact the implementability of GC, while sustainability is hampered by sparse financial and human resources. Reach affects both implementability and sustainability; consistent participation allows for group cohesion and a sufficiently large number of recipients is needed to render GC cost-effective. Therefore, reach is the heart piece of sustained implementation of GC (see Fig. 3). Yet, outer setting and attitudinal barriers will likely affect reach.



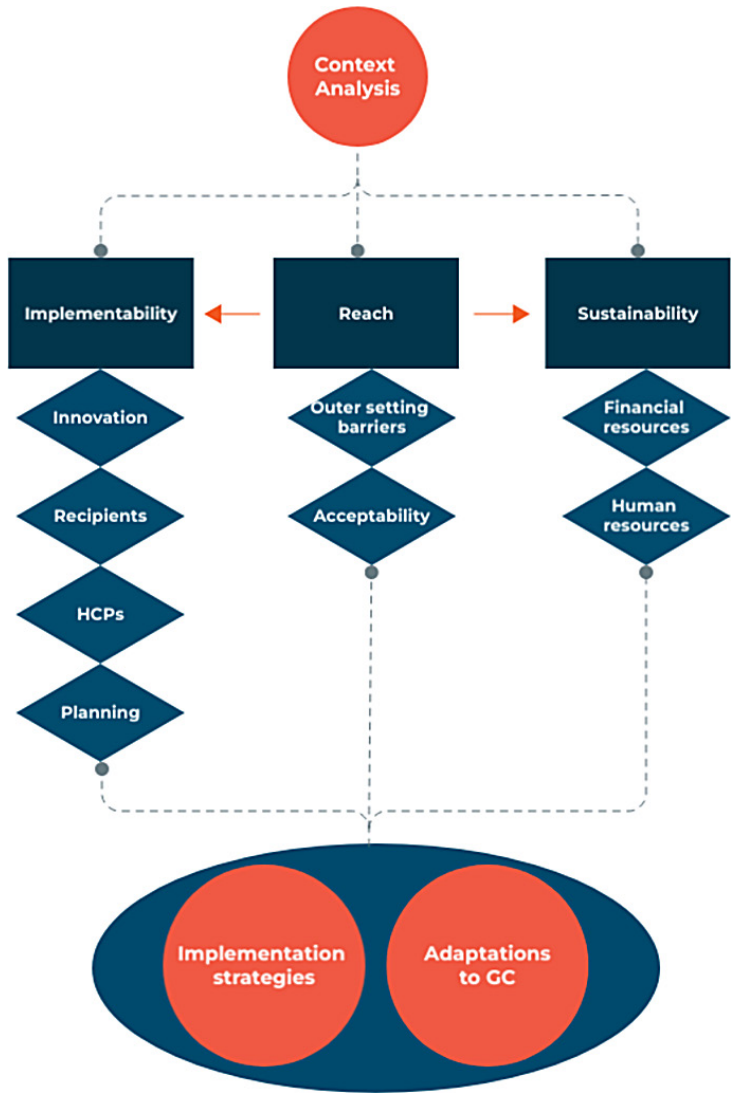


Figure 3. From context analysis to adaptations and implementation strategies

The overall perception of GC was remarkably positive and tension for change (i.e., extent to which interviewees perceived the current model of maternity care as inadequate) was high, especially with regard to postpartum care. Nonetheless, strategies to reach the target population have to be developed and logistical and financial obstacles have to be overcome for successful implementation of GC in Suriname’s primary health care sector.

To implement GC sustainably, administrative buy-in at all levels is needed. As found in previous research [33,34,35,36,37] true buy-in—where financial and human resources are allocated to GC—demands ‘hard’ data on pregnancy outcomes and cost-effectiveness [33]. The generation of corresponding data is especially important in Suriname's currently strained economic situation.

Sparse resources go hand in hand with logistical challenges. Adequate space and sufficient staff are needed to implement and sustain GC [33, 37, 38]. Interviewed HCPs described staff shortage all over the Surinamese health care sector and therefore the suggestion to organise GC outside of midwives' working hours was made. However, a previous study reported that GC was discontinued when added on top of HCPs' regular working schedule as signs of burnout became evident [33]. Overall, on-site HCPs in this study were optimistic about the implementation of GC. Yet, some concerns regarding efficiency, sustainability, and compatibility with the working routine were voiced. Moreover, a need to clarify the roles of all professionals and organizations involved in the project crystallized. When newly introduced, GC can disrupt the workflow which can cause tensions between colleagues [34, 37]. Therefore, aforementioned concerns of HCPs need to be addressed carefully.

Next to financial and logistical hurdles, recruitment challenges are frequently described in the literature [33, 37, 39, 40]. Our findings show that outer setting barriers and lacking acceptability of GC can hamper reach and participation of the target population. While poor (care) infrastructure and competing demands (e.g., lack of childcare/transport/health insurance, scheduling) are common practical barriers to GC attendance [33, 37, 40,41,42] and to accessing health care in general, attitudinal resistance is specific to GC. Concerns regarding trust and privacy in GC were not only reiterated across respondent groups in this study but they were also identified in multiple prior studies [37,38,39,40, 43,44,45]. The tightly-knit communities in the sub-urbs of districts Paramaribo and Wanica appear to act as catalysators for such apprehensions. Settings with similar social structures should be alert as they may encounter similarly accelerated concerns around privacy. One study identified five prerequisites to building trust in GC (vulnerability, communication, reciprocity, chemistry and atmosphere) and emphasized that the development of trust needs time [46]. Hence, when recruiting pregnant women/parents for GC – before parents have met other group members—it may not suffice to openly discuss privacy and confidentiality-related issues but the use of a confidentiality agreement may help overcome concerns at a time when trust had not time to develop, yet [46].

Furthermore, marketing of and communication around GC needs to be explicitly inclusive. Interviewed parents from our study explained that some recipients may be reluctant to join GC as it appears to target couples of high SES. Similarly, a previous study showed that the perception of GC targeting a specific sub-population can yield recruitment issues [37]. Moreover, reach can be jeopardized by discouragement from the social environment [39, 47] and by reluctance towards GC due to its novelty [33, 36, 39]. However, except for misoneism, reasons for discouragement from the social environment remain vague. To the best of our knowledge, strained parental relationships and multi-partnering specifically have not been identified as potential obstructions to GC attendance, yet. However, they might cause recruitment challenges in other settings with complex family constellations. Further reasons for unwillingness to participate in GC include cultural norms, such as non-disclosure of pregnancy and the view that preventative care is unnecessary. Non-disclosure of pregnancy has not been linked to GC recruitment issues, yet, although it is found in many cultures.

Cultural tailoring of the GC model and content is an essential step to increase reach [48]. In Suriname, the use of herbal medicine and traditional remedies is common [49]. For example, vaginal steam baths are a widespread ritual, especially postnatally. Yet, excessive use of steam baths is linked to ‘dry sex’ and quicker spread of sexually transmitted diseases [50]. As some traditional practices, such as vaginal steam baths, can be detrimental to health, they should be discussed in GC sessions in a manner that is respectful of the cultural heritage. On that account, it is crucial to consider the socio-political context when implementing GC in previously colonized countries; [48]especially in a multi-nation project such as GC_1000.

Limitations

Response bias may have painted an overly positive picture of the perception of GC. We acknowledge this limitation and the fact that the prohibition of women to make critical remarks is so deeply rooted in the culture that it is hardly possible to overcome this limitation during a RQI. Due to a lack of actual experience with GC, it was challenging for interviewees to name advantages and disadvantages of the GC model, to suggest specific adaptations, or to foresee the community’s response to GC. However, as recognized in the CFIR addendum, [11] the investigation of anticipated rather than actual implementation outcomes lies in the nature of pre-implementation context analyses. We acknowledge that anticipated barriers and facilitators may differ from actual barriers and facilitators, and therefore evaluation efforts will continue throughout the implementation process. Moreover,

interviews were conducted during the peak of the Covid-19 pandemic, which lead to a number of limitations: (1) several interviews were conducted online as traveling was not possible, (2) reliance on local researchers with less experience in qualitative research methods was inevitable (e.g., use of closed-ended questions), (3) during the interviews much time was allocated to discussing the impact of covid on GC. To overcome covid-imposed challenges, we discussed preliminary findings during elaborate online debriefings, visited implementation sites at a later stage and closely involved the leading Surinamese researchers for member checking of findings. Covid-related themes are not included in our findings as they are less relevant at the time of publication.

Conclusion

Multi-layered contextual factors impact not only implementability and sustainability of GC, but also reach. Therefore – and in agreement with other implementation outcome taxonomies— [51, 52] we advise future researchers and implementors of GC to investigate not only determinants for implementability and sustainability, but also those factors that may hamper, or facilitate up-take. Practical, attitudinal and cultural barriers to GC participation need to be examined. As previously claimed, flexibility is a prerequisite when implementing GC in LMICs [53] but a comprehensive strategic plan that clearly outlines benefits and costs, roles of different professionals, location and scheduling as well as implementation strategies to enhance reach is equally important. Themes identified in this study will inspire the development of adaptations and implementation strategies at a later stage of the GC_1000 project.



REFERENCES

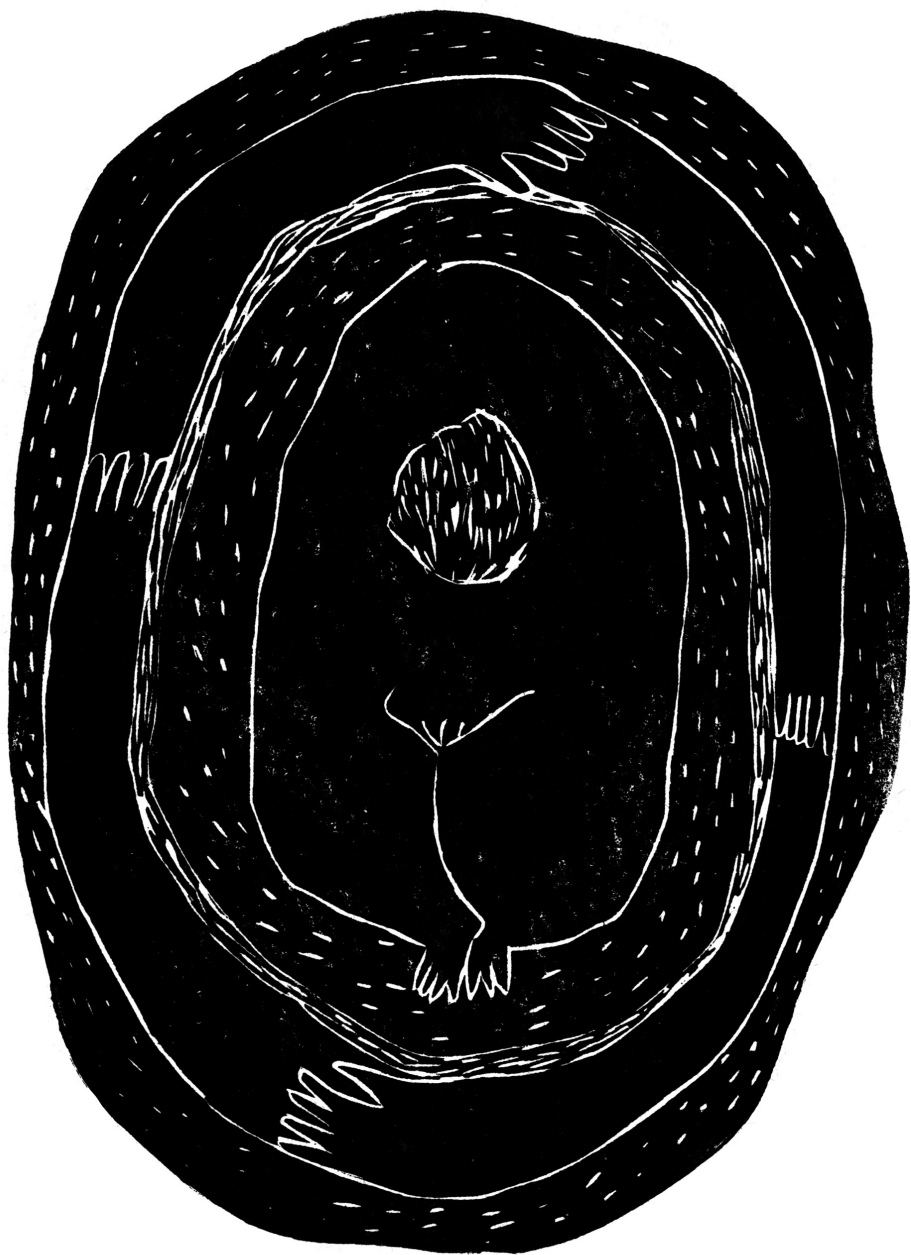
1. Rising SS. Centering pregnancy. An interdisciplinary model of empowerment. *J Nurse Midwifery*. 1998;43:46–54.
2. Centering Health Care Institute. Centering Healthcare – A Snapshot The 13 Essential Elements that define the Centering model. 2023. https://www.centeringhealthcare.org/uploads/files/FX_Fact-Sheet-Full-Set.pdf.
3. Hunter LJ, et al. Better together: A qualitative exploration of women’s perceptions and experiences of group antenatal care. *Women Birth*. 2019;32:336–45.
4. Picklesimer AH, Billings D, Hale N, Blackhurst D, Covington-Kolb S. The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population. *Am J Obstet Gynecol*. 2012;206(415):e411-415.e417.
5. Ickovics JR, et al. Group prenatal care and perinatal outcomes. *Obstet Gynecol*. 2007;110:330–9.
6. Ickovics JR, et al. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. *Obstet Gynecol*. 2003;102:1051–7.
7. Carter EB, et al. Group prenatal care compared with traditional prenatal care: a systematic review and meta-analysis. *Obstet Gynecol*. 2016;128:551–61.
8. Cunningham SD, et al. Group prenatal care reduces risk of preterm birth and low birth weight: a matched cohort study. *J Womens Health (Larchmt)*. 2019;28:17–22.
9. WHO recommendations on antenatal care for a positive pregnancy experience. I. World Health Organization. ISBN 978 92 4 154991 2.
10. Pfadenhauer LM, et al. Context and implementation: a concept analysis towards conceptual maturity. *Z Evid Fortbild Qual Gesundheitswes*. 2015;109:103–14.
11. Damschroder LJ, Reardon CM, Opra Widerquist MA, et al. Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): the CFIR Outcomes Addendum. *Implementation Sci*. 2022;17:7. <https://doi.org/10.1186/s13012-021-01181-5>.
12. Durlak JA, DuPre EP. Implementation matters: a review of research on the influence of implementation on program outcomes and the factors affecting implementation. *Am J Community Psychol*. 2008;41:327.
13. Ilott I, Gerrish K, Booth A, Field B. Testing the Consolidated Framework for Implementation Research on health care innovations from South Yorkshire. *J Eval Clin Pract*. 2013;19(5):915–24. <https://doi.org/10.1111/j.1365-2753.2012.01876.x>.
14. McNeill JA, Reiger KM. Rethinking prenatal care within a social model of health: an exploratory study in Northern Ireland. *Health Care Women Int*. 2015;36:5–25.
15. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated consolidated framework for implementation research based on user feedback. *Implement Sci*. 2022;17:1–16.
16. Damschroder LJ, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009;4:50.
17. Mielke J, Brunkert T, Zúñiga F, et al. Methodological approaches to study context in intervention implementation studies: an evidence gap map. *BMC Med Res Methodol*. 2022;22:320. <https://doi.org/10.1186/s12874-022-01772-w>
18. Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. Cultural sensitivity in public health: defined and demystified. *Ethn Dis*. 1999;9:10–21.
19. Dadich A, Piper A, Coates D. Implementation science in maternity care: a scoping review. *Implementation Sci*. 2021;16:16. <https://doi.org/10.1186/s13012-021-01083-6>.
20. Kodan LR, et al. Trends in maternal mortality in Suriname: 3 confidential enquiries in 3 decades. *AJOG global reports*. 2021;1: 100004.

21. Ministrie van Volksgezondheid. Maternal and Newborn Health Strategy 2021–2025. <https://www.discover-suriname.com/downloads/Beleidsplan-VG-2021-2025.pdf>.
22. Kodan LR, Verschueren KJC, van Roosmalen J, et al. Maternal mortality audit in Suriname between 2010 and 2014, a reproductive age mortality survey. *BMC Pregnancy Childbirth*. 2017;17:275. <https://doi.org/10.1186/s12884-017-1466-6>.
23. Hindori-Mohangoo AD, Hindori MP. Innovatieve zorg rondom zwangerschap en geboorte in Suriname: ervaringen van het Perisur project. (Paramaribo, 2017). ISBN 978-99914-7-404-5. https://perisur.org/wp-content/uploads/2016/01/Boek_Innovatieve_zorg_rondom_zwangerschap_en_geboorte_in_Suriname_2017.pdf.
24. Martens N, Crone MR, Hindori-Mohangoo A, et al. Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. *Implement Sci Commun*. 2022;3:125. <https://doi.org/10.1186/s43058-022-00370-7>
25. Algemeen Bureau voor de Statistiek. Statistisch-Jaarboek 2019–2020 Suriname. (2021).
26. Tongco, M.D.C. Purposive sampling as a tool for informant selection. (2007).
27. Beebe J. (204). Rapid qualitative inquiry: A Field guide to team-based assessment. Rowman & Littlefield.
28. Terry G, et al. The SAGE handbook of qualitative research in psychology. The SAGE Handbook of Qualitative Research in Psychology. 2017;2:17–36.
29. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol*. 2013;13:1–8.
30. O'Connor C, Joffe H. Inter-coder reliability in qualitative research: debates and practical guidelines. *Int J Qual Methods*. 2020;19:1609406919899220.
31. McDonald N, Schoenebeck S, Forte A. Reliability and inter-rater reliability in qualitative research: Norms and guidelines for CSCW and HCI practice. *Proceedings of the ACM on human-computer interaction*. 2019;3:1–23.
32. Bayley N. The California first-year mental scale (No. 243). University of California Press; 1933.
33. Novick G, Womack JA, Sadler LS. Beyond implementation: sustaining group prenatal care and group well-child care. *J Midwifery Womens Health*. 2020;65:512–9.
34. Novick G, et al. Perceptions of barriers and facilitators during implementation of a complex model of group prenatal care in six Urban sites. *Res Nurs Health*. 2015;38:462–74.
35. Novick G, Sadler LS, Knafel KA, Groce NE, Kennedy HP. In a hard spot: providing group prenatal care in two urban clinics. *Midwifery*. 2013;29:690–7.
36. Wiseman O, et al. The challenges and opportunities for implementing group antenatal care ('Pregnancy Circles') as part of standard NHS maternity care: a co-designed qualitative study. *Midwifery*. 2022;109: 103333.
37. Pekkala J, et al. Key considerations for implementing group prenatal care: lessons from 60 practices. *J Midwifery Womens Health*. 2020;65:208–15.
38. Novick G, et al. Women's experience of group prenatal care. *Qual Health Res*. 2011;21:97–116.
39. Phillippi JC, Myers CR. Reasons women in appalachia decline centering pregnancy care. *J Midwifery Womens Health*. 2013;58:516–22.
40. Andrade-Romo Z, et al. Group prenatal care: effectiveness and challenges to implementation. *Rev Saude Publica*. 2019;53:85.
41. Berman R, Weber Yorga K, Sheeder J. Intention to Participate in Group Prenatal Care: Moving Beyond Yes or No. *Health Promotion Practice*. 2020;21(1):123–132. [doi:10.1177/1524839918784943](https://doi.org/10.1177/1524839918784943).
42. Vandermorris A, et al. Adolescents' experiences with group antenatal care: Insights from a mixed-methods study in Senegal. *Tropical Med Int Health*. 2021;26:1700–8.



43. Kennedy HP, et al. "I Wasn't Alone"—a study of group prenatal care in the military. *J Midwifery Womens Health*. 2009;54:176–83.
44. Connor KA, Duran G, Faiz-Nassar M, Mmari K, Minkovitz CS. Feasibility of implementing group well baby/well woman dyad care at federally qualified health centers. *Acad Pediatr*. 2018;18:510–5.
45. Sayinzoga F, et al. Use of a facilitated group process to design and implement a group antenatal and postnatal care program in Rwanda. *J Midwifery Womens Health*. 2018;63:593–601.
46. Kweekel L, Gerrits T, Rijnders M, Brown P. The role of trust in centeringpregnancy: building interpersonal trust relationships in group-based prenatal care in the Netherlands. *Birth*. 2017;44:41–7.
47. Musabyimana A, Lundeen T, Butrick E, et al. Before and after implementation of group antenatal care in Rwanda: a qualitative study of women's experiences. *Reprod Health*. 2019;16:90. <https://doi.org/10.1186/s12978-019-0750-5>.
48. Abrams JA, Forte J, Bettler C, Maxwell M. Considerations for implementing group-level prenatal health interventions in low-resource communities: lessons learned from haiti. *J Midwifery Womens Health*. 2018;63:121–6.
49. van Andel TR. & Ruyschaert. S. *Medicinale en rituele planten van Suriname*: LM Publishers; 2014.
50. Andel, T.v., de Korte, S., Koopmans, D., Behari-Ramdas, J. & Ruyschaert, S. Wasi ondrosei; Het gebruik van vaginale stoombaden in Suriname. *Oso, Tijdschrift voor Surinamistiek en het Caraïbisch gebied*. (2008);27:52–72 .
51. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health*. 1999;89:1322–7.
52. Proctor E, et al. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research Agenda. *Adm Policy Ment Health*. 2011;38:65–76.
53. Sharma J, O'Connor M, Rima Jolivet R. Group antenatal care models in low- and middle-income countries: a systematic evidence synthesis. *Reprod Health*. 2018;15:38. <https://doi.org/10.1186/s12978-018-0476-9>.





CHAPTER 4

Implementing group care in Dutch and Surinamese maternity and child care services

the vital importance of addressing outer context barriers

Published as

*Martens, Nele, Tessa MI Haverkate, Ashna D. Hindori-Mohangoo, Manodj P. Hindori, Carolien J. Aantjes, Katrien Beeckman, Astrid Van Damme et al.
"Implementing group care in Dutch and Surinamese maternity and child care services: the vital importance of addressing outer context barriers."
BMC Pregnancy and Childbirth 24, 527 (2024).*

ABSTRACT

Background

By addressing physical and psychosocial needs, group care (GC) improves health-related behaviours, peer support, parent-provider interactions and may improve birth outcomes. Hence, global implementation of GC is encouraged. Context analyses prior to implementation are vital to elucidate which local factors may support or hinder implementation.

Methods

Contextual analyses conducted in the Netherlands and Suriname were compared to identify the factors relevant to the implementability of GC as perceived by healthcare professionals (HCPs). 32 semi-structured interviews were conducted with Dutch and Surinamese healthcare professionals. Audio recordings were transcribed verbatim and coded using the Framework approach. The Consolidated Framework for Implementation Research guided the development of the interview guide and of the coding tree.

Results

Outer setting: Concerns regarding funding surfaced in both countries. Due to limited health insurance coverage, additional fees would limit accessibility in Suriname. In the Netherlands, midwives dreaded lower revenue due to reimbursement policies that favour one-on-one care. Inner setting: Appropriate space for GC was absent in one Dutch and three Surinamese facilities. Role division regarding GC implementation was clearer in the Netherlands than in Suriname. Innovation: HCPs from both countries expected increased social support, health knowledge among women, and continuity of care(r). Individuals/innovation deliverers: Self-efficacy and motivation emerged as intertwined determinants to GC implementation in both countries. Individuals/innovation recipients: Competing demands can potentially lower acceptability of GC in both countries. While Dutch HCPs prioritised an open dialogue with mothers, Surinamese HCPs encouraged the inclusion of partners. Process: Campaigns to raise awareness of GC were proposed. Language barriers were a concern for Dutch but not for Surinamese HCPs.

Conclusions

While the most striking differences between both countries were found in the outer setting, they trickle down and affect all layers of context. Ultimately, at a later stage, the process evaluation will show if those outer setting barriers we identified prior to implementation actually hindered GC implementation. Changes to the health care systems would ensure sustained implementation in both countries,

and this conclusion feeds into a more general discussion: how to proceed when contextual analyses reveal barriers that cannot be addressed with the time and resources available.

BACKGROUND

The first thousand days of a child's life, from conception until age two, lay the foundation for healthy development [1]. As the health of the mother and her unborn child are inherently intertwined, high-quality maternity care is a pillar of good public health [2]. The World Health Organisation's (WHO) guideline on routine antenatal care (ANC) provides evidence-informed recommendations to enhance the quality and uptake of maternity care services [3]. Amongst others, they recommend the implementation of group care (GC), a holistic approach to maternal care that addresses overall well-being and facilitates the empowerment of mothers. In GC, (expecting) mothers/parents (and children in postnatal care (PNC)) join for approximately eight to ten two-hour sessions that combine elements of health assessment, health education and social support [4]. Through interactive discussions GC considerably expands the educational and relational components of individual care by providing mothers /parents with in-depth knowledge and support [5]. Using a facilitative approach to health education, mothers are empowered to engage in critical thinking and mutual learning among peers and to take ownership of their pregnancy and care [4, 6]. By addressing physical and psychosocial needs, GC improves health-related behaviours, fosters peer support and enhances parent-provider interactions [7]. Moreover, there is evidence that GC positively impacts birth weight and preterm birth rates [8,9,10,11,12]. Considering these positive findings, the global implementation and scale-up of GC are encouraged by the WHO [3].

The WHO also emphasises the importance of understanding the implementation context before introducing GC³, as transferring complex interventions - such as GC - to a new context increases the risk of implementation failure [13,14,15,16]. Context in implementation has been defined as the complex adaptive systems that form the dynamic environment(s) in which implementation processes are situated [17]. Implementability, the likelihood that the intervention will be implemented as intended, can be anticipated through context analyses, i.e. the investigation of implementation determinants before introducing an intervention in a new setting [18]. Contexts can be systematically assessed using determinant frameworks, such as the Consolidated Framework for Implementation Research (CFIR) [19, 20]. The CFIR describes five interacting domains: innovation, outer setting, inner setting, individual, and implementation process as well as 48 constructs and 19 subconstructs across all five domains. Using the CFIR as a guide, context analyses can illuminate those determinants that will likely impact the implementation and that should inform implementation strategy and adaptation development to enhance the chances of successful implementation [21,22,23].

The innovative implementation research project ‘GC during the first 1000 days (GC_1000)’ aims to identify and disseminate contextually appropriate, sustainable mechanisms for implementing GC [24]. For this purpose, GC is implemented in seven countries with preceding contextual analyses. This study compares contextual factors relevant to the implementability of GC in two of these countries, the Netherlands and Suriname. Suriname and the Netherlands are not only linked through colonial history and Dutch language but both countries also have a comparable health care system with regards to ANC and PNC provision: ANC at primary care settings is midwife-led and PNC is provided in form of “consultatiebureau” (well-child care clinic). On the other hand, Suriname and the Netherlands differ with regard to pivotal implementation determinants, including cultural and economic factors.

We aimed to understand similarities and differences in contextual factors, including organizational and socio-cultural factors, and how they may be of influence on the implementation of GC.

Healthcare professionals (HCPs) and their attitudes play a crucial role in the implementation of innovations, such as GC [25, 26]. For instance, in Suriname, early involvement of HCPs in the development of national obstetric guidelines facilitated their implementation [27]. HCPs (or innovation deliverers) and their need, capability, opportunity and motivation to implement are an important bottleneck according to prominent implementation frameworks [20, 28, 29]. Therefore, our study sought to answer the following two research questions:

What factors influence the implementability of antenatal and postnatal group care in the Netherlands and Suriname according to health care professionals, and what are the differences and similarities between these two countries?

METHODS

The present study is part of the European Union funded Horizon2020 project ‘GC during the first 1000 days (GC_1000)’ (grant agreement number 848147) [24]. For this sub-study, context analyses were conducted before the implementation of GC in Dutch and Surinamese maternity and child care services. Approval for this study was granted by the Medical-Ethics Review Committee Leiden Den Haag Delft and the Ethical Commission of Suriname’s Ministry of Health.



Study design and setting

The Netherlands is a high-income country in Europe with a population of about 17,5 million [30]. The country's Maternal Mortality Rate (MMR) significantly decreased to 6.2 per 100,000 live births between 2006 and 2018, reducing the maternal mortality risk by half from the preceding decade [31]. Nevertheless, disparities remain, amongst others for mothers with a background from Suriname and the Dutch Antilles [31]. One factor contributing to these discrepancies is the high prevalence of risk factors associated with adverse outcomes, such as obesity [31, 32]. The Netherlands has a unique maternity care system, characterised by midwifery-led care [33]. Community midwives play a crucial role in providing antenatal, perinatal and the first weeks postnatal care to mothers with low-risk pregnancies [34]. Most community midwives operate in independent group practices, where individual provider-to-user care is standard practice [35, 36]. Typically, mothers will have twelve ANC appointments of fifteen minutes each, which are scheduled according to a '4-3-2-1' scheme [36]. In the first weeks of pregnancy, appointments are every four weeks, which builds up to every three weeks, biweekly and eventually to weekly close to the due date. When complications arise during pregnancy, childbirth or postpartum, are mothers referred to a hospital for secondary care [34, 36]. Further interdisciplinary collaboration is seen, for example by involving municipalities to provide additional social support [37]. Postnatal care is provided by carers who visit the family home daily in the first eight days postpartum. In 2011, GC was first introduced in the Netherlands [36]. Despite considerable scale-up, one-on-one care remains the standard model of ANC.

Suriname is an upper-middle-income country on the northeast coast of South America with a population of about 623,000 [38]. In Suriname, the MMR has plateaued around at 130 maternal deaths per 100,000 live births over the past decade, of which almost half is preventable [39]. A gap in the continuum of care, challenges in accessing care, and poor quality of care contribute to the high MMR [39]. In Suriname, maternity care is based on obstetric-led or shared models of care [40]. In the shared model, low-risk mothers, receive individual provider-to-user ANC in a primary care setting up until the thirtieth week of pregnancy, when they are referred to secondary care [40]. The Regional Health Service (RGD), a semi-public institute responsible for primary care in the coastal area, is one of three primary healthcare providers offering ANC. The RGD clinics' medical teams usually include several midwives, nurses and general practitioners (GPs) managing the clinic. On average, approximately half of mothers have at least eight ANC appointments, which are scheduled according to a '4-3-2-1' scheme [41]. Postnatal care is provided by RGD midwives only for mothers who deliver at RGD clinics, and

they account for a small fraction of deliveries. In 2014, GC was introduced in three hospitals in Paramaribo under the name SamenZwanger. The implementation was successful and continued at one of the hospitals [42]. Attempting to reach vulnerable parents, midwives employed at more deprived RGD clinics followed the GC training in 2019. However, due to the Covid-pandemic no groups were conducted in 2020-2022 [43].

Participants and sampling

In the Netherlands, four midwifery practices and one hospital in Rotterdam were selected in collaboration with the municipality of Rotterdam. These sites were suitable for inclusion in GC_1000 as they had no GC experience, a sufficient number of clients with diverse socio-cultural backgrounds, and they were supported by an implementation team from the municipality of Rotterdam and the national programme 'promising start' (Kansrijke Start). Moreover, at least two midwives at each implementation site had to agree to follow the GC training.

In Suriname, three RGD clinics in the outer skirts of Paramaribo and one clinic located in district Wanica were identified as implementation sites for antenatal and postnatal GC by an implementation team from the RGD and the Foundation for Perinatal Interventions and Research in Suriname (Perisur). Selection criteria included an appropriate space for the GC sessions, at least two midwives working at the sites for group ANC and at least two nurses and at least two doctors for the sites for postnatal GC, and a sufficient number of clients receiving ANC/PNC to create groups. All Surinamese implementation sites had previously aimed to introduced GC but due to the Covid-19 pandemic implementation had to be paused.

Data collection

In the Netherlands, data was collected by a researcher from the Netherlands with German origins (NM), a researcher from Belgium (AVD) and one Dutch researcher (MC). All attended a training on Rapid Qualitative Inquiry (RQI) [44] provided by a professor who specialises in medical anthropology (RR). RQI is an efficient, team-based approach to gain insight into complex situations [44]. In Suriname, data was collected by four local researchers (AHM, MH and two colleagues) and four external researchers (NM, AVD and two research assistants). Surinamese researchers also followed an online training on RQI prior to data collection provided by NM and AVD. Preliminary findings were discussed during regular debriefing where local and external researchers provided insights from the 'inside' and an 'outside' perspective.

In both countries, HCPs were invited to participate in the interviews. Participants were informed about the purpose of the study and if consent was obtained interviews were scheduled. In collaboration with local researchers, online and face-to-face semi-structured interviews were conducted and audio recorded. The CFIR guided the development of the interview guide, which consisted of two parts. The first part explored the current situation of maternity and new-born care and the characteristics and needs of the target population. Subsequently, a vignette, or a four-minute video introduced GC (for respondents who had no to little prior knowledge about GC), followed by questions regarding the HCPs' overall perspectives on GC and its suitability for their client population (e.g., What do you like/dislike about GC?), as well as their anticipations concerning the introduction of GC in their organization (e.g., What will be challenging for you as a GC facilitator? What do you need to resolve those challenges?).

Data analysis

The Framework Method (FM) was selected to structure coding and analysis of the data as it allowed for systematic comparison of findings from the Netherlands and Suriname [45, 46]. First, audio recordings of interviews were transcribed verbatim and coded according to the predefined coding tree, which was based on the updated CFIR [18] and complemented with inductively derived codes [47]. Next, coded data were reduced by systematically summarising data in matrices where rows correspond to cases, columns to codes and where cells summarise data [45]. Matrix outputs of the Netherlands and Suriname were analysed using a cross-case approach to explore and identify patterns and key concepts of implementability in each country. Subsequently, a cross-country comparison was made and overarching themes were identified, allowing for a comprehensive understanding of the similarities and differences between implementation determinants across the Netherlands and Suriname. Throughout the coding and analysis, reflective notes were taken and co-authors engaged in active discussions. To ensure cultural validity and contextual relevance findings underwent member checking by local researchers who are well-acquainted with the 'insider perspective' (AHM, MH). Moreover, researchers (NM and TH) contemplated different viewpoints, compared interview transcripts, linked findings to theoretical concepts and in this way clarified ambiguous points and revised themes. For example, one data point that underwent thorough discussion was the issue of workload/staff shortage. Eventually, consensus was reached to place this critical factor under the inner setting domain. This iterative approach not only refined our understanding of specific data points but also illuminated the complex interplay of factors across CFIR domains.

RESULTS

Characteristics of the study participants

Thirty two interviews were performed: sixteen interviews with Dutch midwives who intended to implement GC, and sixteen interviews with Surinamese HCPs (seven midwives, five nurses, four GPs). With the exception of one midwife who led the implementation of the antenatal GC model SamenZwanger in a hospital, all interviewees were employed at one of the implementation sites, in primary care settings. The semi-structured interviews were conducted online or face-to-face and lasted 30 to 60 min. With the exception of one interview in English language, all interviews were conducted in Dutch language.

Implementation determinants

Factors that influence the implementability of GC in the Dutch and Surinamese settings were identified and matched to the CFIR domains [19, 20]. Whereas some of these factors identified corresponded seamlessly to CFIR constructs (e.g., competency and motivation), others did not correspond to any CFIR construct and were mapped onto the CFIR domain deemed most appropriate (e.g., characteristics of maternity care) fig 1.

Inner setting: characteristics of maternity care

Role division

At the Dutch implementation sites, all trained midwives and practice assistants were designated GC facilitators. In Suriname, role division was less clear. While midwives were seen as suitable candidates for GC facilitation by all HCPs, nurses also showed willingness to co-facilitate, while GPs anticipated less direct involvement and assumed an advisory role.

Work infrastructure/flow

Concerns regarding the substantial time investment required to set up and facilitate GC were raised by respondents from both countries. The logistical burden was experienced as particularly heavy in one Dutch setting as one midwife explained:

“Well, I think that it is because, at this moment in particular, we don’t yet have a concrete plan. The ambition is there, the enthusiasm is there. I also sincerely believe that we can recruit people. But the logistics... There is still a bit of setback because we just don’t have a clear picture of the optimal way to organise everything.” Clinical midwife, the Netherlands.



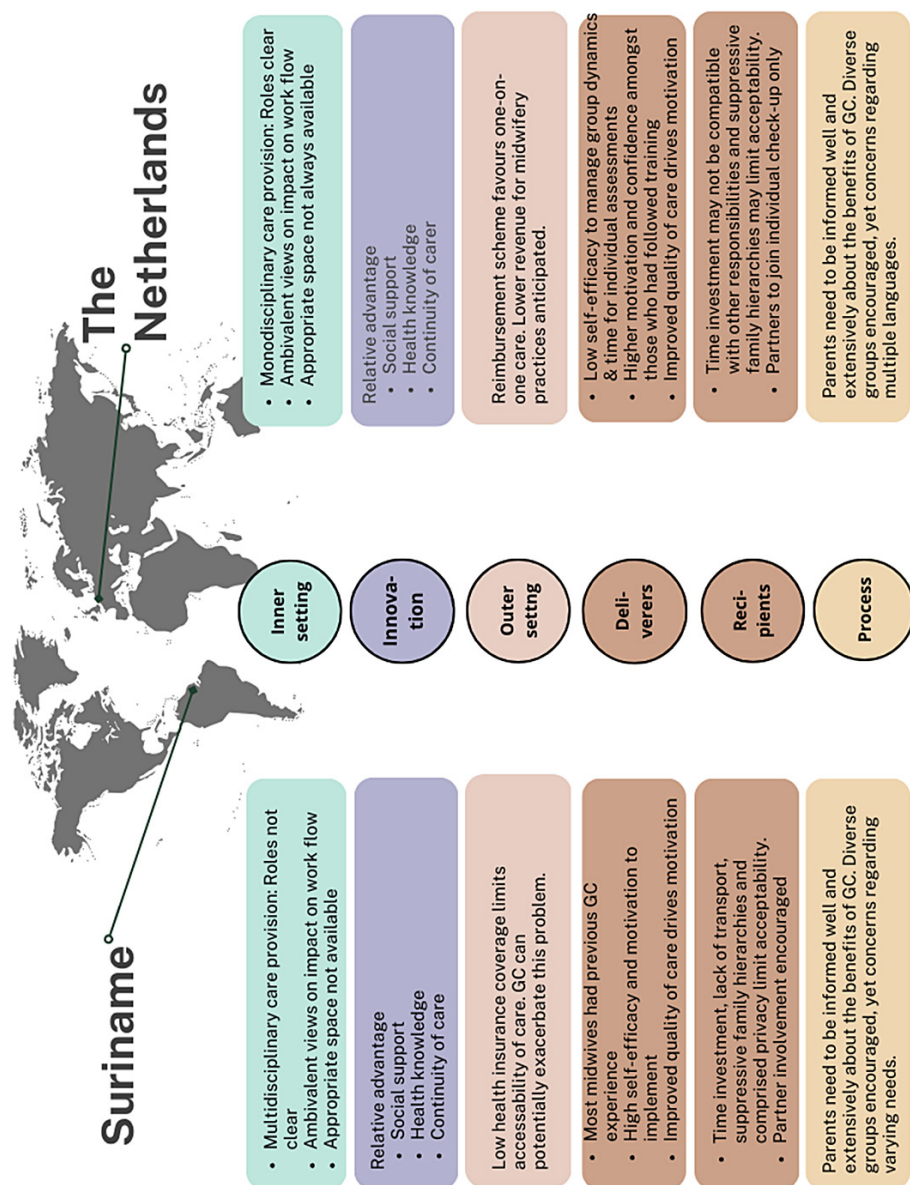


Figure 1. Implementation determinants in Suriname and the Netherlands

Organisational challenges also surfaced in interviews with Surinamese HCPs, particularly with regard to time and staff capacity. In Suriname, at least one HCP at each implementation site experienced heavy workload and staff shortage. While most Surinamese midwives would prefer scheduling GC during their regular working hours, a GP suggested to schedule GC outside of the midwives' regular working hours without additional compensation as this would save resources. However, not all interviewees anticipated an additional time investment. In fact, several HCPs from both countries expected that GC would be more time efficient than individual care. This discussion on staff capacity and resources was more pronounced in Suriname where GC was considered additional care on top of standard care, whereas Dutch midwives planned to offer GC instead of one-one-one care.

Physical infrastructure

One of the four implementation sites in the Netherlands did not have an appropriate space available and would have to rent a sufficiently spacious room elsewhere to host GC sessions. Surinamese HCPs shared this concern and linked it with the recipients' likely concern for confidentiality (as described under 5. Recipient: acceptability, competing demands and paternal involvement) in mind, two Surinamese midwives emphasised the need for a sufficiently private room which was not available at the RGD clinics.

Innovation: relative advantage

Continuity of care(r)

As GC sessions are supposed to be consistently facilitated by the same HCPs, Dutch midwives expected improved continuity of carer, i.e. mothers would be seen by the same midwife throughout their ANC trajectory. In Suriname where provision of PNC is lacking, improved continuity of care was amongst the expected benefits of GC, as at least one GC session is held postpartum. Moreover, HCPs from both countries anticipated a stronger connection with mothers and their families.

Health education

Most HCPs from both countries perceived GC's extended duration and facilitative (rather than didactic) style as advantageous for their client's learning. While a few Dutch midwives doubted the usefulness of the suggested tools to facilitate discussions, the majority of HCPs (both Dutch and Surinamese) thought that the GC methods would encourage parents to take on an active role in their own learning experiences. In this way, their health knowledge and preparedness for parenthood would increase. HCPs from both countries thought that discussing topics related to lifestyle, pregnancy, and childbirth could effectively prevent



pregnancy complications (i.e., gestational diabetes, hypertension, overweight, intoxication). Moreover, while Dutch and Surinamese respondents agreed on the importance of addressing family planning, this was often mentioned by Surinamese HCPs in the light of the high prevalence of unintended and unwanted pregnancies in Suriname, especially amongst young women. In the Netherlands, interviewees did not mention unintended pregnancies as characteristic of their client population. Furthermore, Surinamese HCPs emphasized the need to include topics which would help parents prepare for the postpartum period (e.g., planning support, managing postpartum pain and depression, and new-born care).

Social support

HCPs from both countries implied that GC could effectively address the need for additional social support and thus improve mothers' overall well-being. HCPs discussed social issues prevalent in both countries (e.g., financial concerns and substance use), and others which were context-specific (e.g., housing problems in the Netherlands or unemployment in Suriname). Dutch and Surinamese HCPs agreed that bringing parents together and sharing experiences in GC would create a social network, which would be extremely valuable to help them cope with such issues. A Dutch midwife who participated in GC during her own pregnancy explained:

“The trajectory after that [when GC is finished], when you are no longer assigned a midwife and are with your new-born child and you wonder even as a midwife yourself: ‘Is this normal?’. And then it is nice that you can text others in such a group [chat]: ‘Hey this is what I see, this is what I experience, can anyone relate?’. I believe that even as a midwife, let alone as a layperson, you can experience that you do not know where to go or what to do. So, it is very nice to still be able to rely on that [support network].” Community midwife, the Netherlands.

Outer setting: financing

In Suriname, HCPs noticed that most mothers are not (completely) insured for ANC/PNC costs. Mothers who apply for new health insurance cards often face bureaucratic hurdles and lengthy delays. Uninsured clients must pay out of pocket for medical treatments and preventative examinations, which many cannot afford. HCPs from Suriname feared that the implementation of GC may exacerbate this issue of limited accessibility of care, because GC would be offered in addition to individual care in Suriname, rendering it more costly. Thus, parents with low income would be unable to participate.

In the Netherlands, concerns regarding funding discouraged Dutch HCPs to implement GC. Midwives in the Netherlands pointed out that the facilitator training for midwives (as described under 4. GC facilitators: HCP self-efficacy and motivation) was costly, and they doubted their willingness to follow the training if it would not have been subsidised. Moreover, concerns regarding the reimbursement scheme and the cost-effectiveness of GC were raised by Dutch midwives.

Innovation deliverers: HCP self-efficacy and motivation

From the interviews with HCPs from both countries, self-efficacy and motivation emerged as intertwined determinants to GC implementation.

Facilitation skills and experience

Although the majority of the respondents from both countries recognised that their work experience has provided them with a range of competencies to provide GC, they also mentioned the need for additional skills, such as guiding group discussions, managing dynamics, and fostering a respectful environment. Dutch midwives raised concerns about their readiness to “shift gears mentally” from individual to group care. Two Dutch midwives specifically stressed that they were nervous about speaking in front of a group of people.

“And will we manage to shift gears mentally? Some of us have been working like this for ten if not twenty years”. Community midwife, the Netherlands.

Furthermore, the majority of Dutch midwives doubted their ability to effectively manage the time allocated for the three-minute individual assessment in GC, while also addressing the emotional needs of mothers. Such concerns regarding time-management were not raised in Suriname.

Overall HCPs with previous GC experience appeared to be more self-confident and have alleviated trust in GC methods and motivation to implementation. For example, a two-day facilitator training was provided for the Dutch HCPs to familiarise them with the GC model. Among the respondents who had already followed the training, it not only increased their enthusiasm but removed pre-existing scepticism. All Surinamese midwives had previous GC facilitation experience which had been a positive experience for them and resulted in positive feedback from participants, increasing their motivation to implement.

Motivation

Dutch and Surinamese respondents agreed that improved quality of care was the primary driving force behind their motivation to implement GC. Moreover, the two midwives employed at the Dutch hospital setting aspired to enhance primary and secondary care collaboration. Two Dutch community midwives explained that the high saturation of midwifery practices in their neighbourhood led to competition for clients. They saw the implementation of GC as a way to distinguish their practice and gain a competitive advantage. Surinamese respondents emphasised that they do not want to put their efforts into a short-term initiative but instead want to create an improved, long-lasting approach to care provision.

Innovation recipient: acceptability, competing demands and paternal involvement

Acceptability and competing demands

HCPs from both countries expected that the demanded time investment may render their client population apprehensive of participating in GC, as it may collide with work, or care obligations. Dutch HCPs emphasised the need to accommodate for mothers' work schedules, for example by organising GC in the evening. In Suriname lack of transportation to RGD clinics may affect willingness to participate. Moreover, Surinamese HCPs expected their patients to raise concerns regarding compromised privacy in GC. One Surinamese GP suggested that GC might not suit the Surinamese context due to privacy reasons.

"I have to say that, in Suriname, we are quite wary of any information that we are asked to share with others." Midwife, Suriname.

While such privacy-related concerns were not voiced by Dutch interviewees, suppressive family hierarchies that may interfere with GC attendance can be found in (sub-)cultures in both countries according to interviewed HCPs. Dutch and Surinamese respondents explained that in some of the respective (sub-)cultures the decision-making power is held by men, and they may forbid GC participation. Therefore, HCPs from both countries emphasised the need to not only engage and educate mothers but also their partners/families about the advantages of GC.

Paternal involvement

Dutch and Surinamese HCPs agreed that when partners attend standard care appointments, their presence often influences the HCP-service user communication. For example, partners dominate the conversation, or mothers do

not speak freely. This is particularly noticeable when partners act as interpreters when mothers do not speak Dutch, which is not rare in the Dutch settings. Therefore, Dutch HCPs suggested that partners only join for the individual check-ups and not during group discussions. Surinamese respondents, on the other hand, preferred to involve partners as much as possible, acknowledging their active role in the pregnancy and preparing them for the post-partum period.

“Do you know how very important it is that the father also understands that it is beneficial for him to be involved in the process, in the preparation of having a new human being or a baby and that it is also pleasant for the mother to get that support from her partner? That especially is important.” GP, Suriname.

Implementation process: tailored implementation strategies

Recruiting and engaging

A few Dutch and Surinamese midwives suggested incorporating a detailed introduction to GC in the first individual ANC appointment to raise awareness. Information should be communicated using accessible language (communication that considers lower reading levels or different language needs) and inclusive, attractive, and relatable visuals. Interviewees from both countries proposed raising awareness of GC through campaigns using traditional and social media.

Recruitment of diverse groups

The majority of respondents from both the Netherlands and Suriname supported the recruitment of diverse groups with regard to culture and socioeconomic status. However, selecting content that matches variable educational needs could be challenging, acknowledged HCPs from both countries. Moreover, in the Netherlands, respondents shared wariness about language barriers, whereas implementability of mixed-language groups was not a concern among Surinamese HCPs, as HCPs and clients are predominantly multilingual.

DISCUSSION

Our study on the perceptions of Dutch and Surinamese HCPs revealed that contextual factors related to the intervention, individuals involved, inner setting and implementation process influence the implementability of GC. However, we found that factors related to the outer setting were most influential. Not only were the most prominent discrepancies between the two countries found in the outer setting, but also their impact was discernible in all other layers of context.



Comparison of contextual factors

While two commonly reported benefits of GC, education on health promotion and social support [7, 48,49,50,51,52], are the most prominent advantages of GC named in both countries, views on anticipated improvements in continuity of care(r) differed between Dutch and Surinamese respondents (intervention domain, relative advantage). These divergent expectations may be linked to structural disparities between the health care systems of both countries (outer setting). Surinamese HCPs expected that the implementation of GC can foster continuity of care, which is urgently needed especially for mothers delivering in secondary care facilities (86%) [39] and who do not receive postnatal care. In contrast, Dutch postnatal care is exceptionally well-positioned, yet continuity of carer is lacking in most Dutch midwifery practices where mothers encounter a number of different midwives during their ANC trajectory. Therefore, Dutch midwives viewed ‘continuity of carer’ rather than ‘continuity of care’ as a potential benefit of GC. Contrary to the opinion voiced by Suriname HCPs, we argue that it is not entirely clear how the postnatal care gap in the Surinamese context can be bridged with GC. Although not explicitly stated in the interviews, we suspect that Surinamese HCPs hoped for GC-induced continuity of care in two ways: (1) mothers who participate in GC would also deliver at the RGD clinics and hence receive postnatal care provided by RGD midwives; (2) antenatal GC would seamlessly transition into postnatal GC. While the idea to encourage mothers during GC sessions to deliver at RGD clinics seems plausible, ideas regarding a continuous GC model that extends into the postnatal period remained vague. Usually, the antenatal GC model includes one postnatal session that can hardly compensate for well-organized postpartum care, including home visits, during the first days/weeks postpartum. The fact that Surinamese and Dutch midwives expected divergent benefits (continuity of care vs. continuity of carer) can be linked to different needs in both countries. We argue that inventorying HCP’s needs and expectations prior to the implementation of GC is advisable as it facilitates hands-on planning, which in turn fosters realistic expectations.

Relevant contextual factors related to the innovation deliverers were remarkably similar between countries (individuals domain). Heightened quality of care (innovation domain, relative advantage) was the most frequently mentioned reason to implement GC in Suriname and in the Netherlands (individuals domain, motivation). Furthermore, two Dutch midwives admitted that the idea that GC can attract clients, and in this way create a competitive advantage over other midwifery practices, played into their motivation. Such ideas did not surface in the interviews with Surinamese HCPs.

This motivational discrepancy makes sense in the light of structural differences between the two health care systems (outer setting). In the Netherlands, midwives run their own clinics. They are not only HCPs but also owners of small businesses and they receive funding for each client, which is why competition for clients is more important to them than for Surinamese HCPs, who are all employed by a public health care institution and do not have to compete for clients with each other. Midwives from both countries are primarily intrinsically motivated, yet, health care system factors also shape their motivation. Thorough understanding of the health care system and payment flows will help implementers comprehend HCP's motivation to implement GC. Moreover, in both countries, interconnection between motivation and prior GC experience as well as between motivation and self-efficacy were identified. Correspondingly, a previous study found that Australian midwives grew confidence in their facilitation skills and appreciation for the GC model with experience [53]. Thus, it is not surprising that Surinamese midwives – who were all trained and had some GC facilitation experience – appeared on average more confident in their capability to successfully conduct GC. A high-quality training prior to implementation and regular intervision and/or supervision sessions may foster confidence and motivation. Moreover, it seems important that trained midwives run groups regularly to gain experience.

Despite the aforementioned parallels in the innovation domain (expected advantages) and the individuals domain (innovation deliverers, motivation and self-efficacy), distinct concerns regarding factors in the outer setting as well as the inner setting became evident. In Suriname, the additional financial burden of GC will ultimately be carried by innovation recipients who are insufficiently insured (outer setting domain), limiting accessibility. Dutch HCPs, on the other hand, anticipated a lower revenue for midwiferies (inner setting domain, resources), potentially hampering the sustainability of providing GC. A recent study from the Netherlands proves that these concerns are valid; costs are €45 higher per person in GC, compared to one-on-one care [54]. Limited resources and funding are indeed common obstacles when implementing GC [55,56,57,58,59]. Frequently, implementors rely on subsidies [55, 57], leaving GC in a vulnerable position where subsidies serve as a band aid to cover overt symptoms while the underlying condition - lack of sustained funding - remains untreated. Long-term changes at policy level (and the execution thereof) are needed in both countries to sustain GC beyond the timespan of this project (outer setting domain). In the Netherlands, a reimbursement plan that renders GC at least as profitable as one-on-one care for midwifery practices is warranted for sustained implementation. Given that the extra investment of €45 per person in GC is balanced out by €67



long-term cost saving per person - due to increased breastfeeding rates, reduced prevalence of pregnancy induced hypertension and decreased postpartum smoking – the development of a reimbursement plan that supports GC is also in line with the quadruple aim for optimizing health care systems [60]. Thus, corresponding amendments to reimbursement plans should be supported by health insurance companies and policy makers, and in fact the Dutch midwifery organisation KNOV (Koninklijke Nederlandse Organisatie van Verloskundigen) announced that such a reimbursement plan for GC will come into action in 2024 [61].

In Suriname, we argue that recipients must be fully insured against any costs associated with ANC; in practice and not merely theoretically (outer setting domain). Like child care (starting at six weeks postpartum), ANC, including GC, could be funded by the Surinamese government. However, due to economic hardship (outer setting domain), governmental funding for GC specifically will only be allocated once data on pregnancy outcomes and cost-effectiveness are available for GC in the Surinamese context [43]. In both countries, lobby work – with arguments anchored in local data - can advance the needed reimbursement/funding plan for GC. Moreover, to address the financial burden directly and promptly, managers at the Surinamese settings could consider offering GC instead of rather than on top of individual care (inner setting domain).

GC warrants not only financial resources but also human resources. While staff shortage is a major implementation barrier in Suriname (inner setting domain), this was not identified as an obstacle in the Netherlands. Staff shortage in Suriname is inherently linked to governmental spending on health care; demonstrating how outer setting factors influence the inner setting.

Moreover, the monodisciplinary care provision in the Netherlands left no room for unclarities regarding role division, whereas Surinamese HCPs were less certain about the part they and their colleagues would play in implementing GC, as midwives, GPs, and obstetricians share care responsibilities during pregnancy in Suriname. This is yet another example of the impact outer setting factors (monodisciplinary vs. multidisciplinary care provision) have on the inner setting (role clarity).

Midwives from both countries feared that acceptability of GC could be low amongst their clients (recipients domain). Competing demands, such as care and work obligations, were named as potential barriers for participation in both countries, whereas privacy concerns were only named as a barrier for implementation in

Suriname. Although privacy concerns are commonly found in the GC literature [59, 62,63,64,65,66,67] and also in the Dutch context [68, 69], their aggregation in Suriname may be explained by their rooting in tightly knit social networks (outer setting domain) [43]. Potentially low acceptability of recipients was also linked to paternalistic family structures that can be found in the Netherlands and in Suriname (outer setting domain). Hence, when developing recruitment strategies, buy-in of fathers and other male family members needs to be considered (implementation process domain).

HCPs from the Netherlands and Suriname had divergent opinions regarding the target population (innovation recipients). Dutch midwives prioritised openness of mothers and suggested to include partners merely during individual check-ups, whereas Surinamese HCPs stressed the need to include partners throughout. In light of the organisation of postnatal care in both contexts (outer setting), these divergent stances regarding partner involvement make sense. In the Netherlands postpartum care “kraamzorg” is exceptionally thorough: a postnatal carer visits the family home daily in the first week to support the new parents. In sharp contrast, most Surinamese mothers do not receive postnatal care and need to rely on their social environment for support. Hence, Surinamese midwives saw GC as a welcome opportunity to raise awareness amongst fathers of their postnatal duties.

As evident from our comparison of implementation factors in Suriname and the Netherlands, CFIR domains are inherently intertwined. While the most striking differences between both countries were found in the outer setting, they trickle down and affect all layers of context. As factors within and across domains influence each other and in combination impact implementation, it is hard to disentangle them and conclude causal mechanisms [70]. Therefore, a holistic view of context is encouraged [70].

Still, our findings and other evidence point to the magnitude of outer setting (or macro-level) factors but they remain understudied, or underreported in context analyses [22]. Lack of guidance, or research tools may account for this scarcity [22]. For instance, outer setting factors are under emphasized in most determinant frameworks [70]. An alternative explanation for the underreporting of outer setting barriers is that they appear inalterable.

Limitations

The overall perception of GC may have been disproportionately positive due to selection bias as we interviewed HCPs at settings that agreed to implement GC. We also recognise that actual barriers and facilitators may differ from anticipated determinants [18]. However, as acknowledged in the CFIR addendum [18], pre-implementation context analyses are characterised by their tendency to focus on anticipated rather than actual implementation outcomes and evaluation activities will continue throughout the implementation process. Moreover, dependency on local researchers with less experience in qualitative research methods (e.g., use of closed-ended questions) during the peak of the COVID-19 pandemic led to a variable richness of data. Furthermore, several interviews were conducted online (due to travel restrictions/social distancing) and at times conversations were interrupted due to technical challenges. Moreover, as contextual factors are dynamic, external validity is limited.

Implications for research and practice

The findings of our contextual analyses raise a considerable dilemma as to how researchers and implementers should proceed when (for the scope of the project) insurmountable barriers (such as a need for amendments to reimbursement and health insurance systems) are encountered at an early stage? In this project, we formulated suggestions on how to adapt and implement GC and proceeded with implementation. We did not attempt to alter the health care system (policies) of the two countries although they appear to be the bottleneck for implementation success. Ultimately, at a later stage, the GC_1000 process evaluation will show if those outer setting barriers we identified actually hindered the implementation of GC. In the meantime, we are left to wonder if our way forward - proceeding to implement GC despite the identification of alarming barriers in the outer setting - was the best way forward.

Given that we had to meet our funder's targets (e.g., at least five groups in each country), stopping, or postponing the implementation was not a viable option. Arguably, more flexibility with regard to project targets within implementation projects is needed, as to enable cost-effective, sensible choices based on results of context analyses. Ideally, this flexibility is apparent in research proposals where the possibility of obstacles that cannot be overcome timely is acknowledged and various possible scenarios and corresponding solutions are anticipated. In our case, a solution could have been to postpone the implementation and to focus on lobby work first to attain the needed health care system changes. In the Netherlands a mainly bottom-up approach was applied; from the introduction of GC in 2011 enthusiastic

midwives, researchers, the midwifery organization and midwifery educators joined forces to implement, deliver evidence and influence policy makers through the use of (social) media and participation in relevant maternity care networks and programs. But should researchers be involved in such lobby work at all?

As aforementioned, in Suriname, governmental funding for GC will only become available if locally generated evidence points to improved pregnancy outcomes and cost-effectiveness. Thus, researchers could design and conduct studies, such as effectiveness-implementation hybrid designs [71], that are tailored to policy makers' decision-making process, before considering to embark on lobby work.

A different approach to implementation science proposals could also be considered. Contextual analyses are usually embedded in implementation science projects but their findings are frequently neglected [22, 72], because – as mentioned above – the show must go on. Arguably context analyses should be considered as separate studies that lay the groundwork for the decision to grant an implementation project, or not. When findings of contextual analyses indicate that implementation failure is likely (e.g., due to understaffed health care systems, lack of funding, lack of health insurance coverage), implementation strategies to overcome decisive contextual barriers need be developed first, or resources might be better allocated elsewhere. While Mielke and colleagues argue that funding agencies need to develop specific opportunities to improve methodologies and reporting of context analyses [22], we take the next step forward and argue that these specific opportunities should take the shape of calls for implementation projects in a two-step-process, where context analyses are the first step and gateway to step two, implementation and evaluation. Such a two-step-process of grant allocation would ensure the “implementation of implementation science”, or the connection between implementation science and implementation practice [72], at least at the start of the project. Subsequently, context needs to be addressed throughout the entire implementation process and not merely again at end of the project when evaluation reports are due [72]. Hence, study designs that allow for timely responsiveness to contextual factors, such as prospective rather than retrospective process evaluations, should be considered [72].

If this two-step-process of grant allocation sounds radical, another suggestion is to raise the standards of research proposals for implementation science projects. To an extent, outer settings barriers can be anticipated even before collecting data for context analyses. For instance, thorough literature search and sound knowledge of policies would have informed us about challenges regarding health insurance

coverage and staff shortages in the Surinamese health care sector [73]. The Basel Approach for coNtextual ANALysis (BANANA) proposes a standardised approach to contextual analyses consisting of six components, one of them (component two) includes mapping what is already known about the specific implementation context [74]. We consider this component imperative and suggest that it should proceed the actual context analysis and that it should be included in the research proposal. Such a thorough research proposal would anticipate health care system barriers and propose strategic solutions (or if no solutions can be formulated the proposal would become redundant as the best way forward would be the cessation of the project). The Shaping Public hEalth poliCies To Reduce ineqUalities and harM (SPECTRUM) consortium aims to specifically address outer setting factors, including commercial determinants, to study and more importantly shape public health policies; the SPECTRUM consortium's comprehensive theory of change can serve as a source of inspiration for proposals development [75]. Moreover, funding is such a common obstacle [70, 76, 77] that a clear funding plan should be outlined in every implementation research proposal.

Naturally, such ideas will spark discord amongst implementation scientists, who are under a lot of pressure to secure funding and who do not have the time at hand to write the high-quality proposals we plead for. Work pressure and working conditions of academics are well-known problems of which a detailed discussion goes beyond the scope of this article. However, if we aim for high-quality research proposals that will create the room for addressing contextual factors and ultimately for sensible choices in implementation research projects (which in turn will allocate resources more appropriately), then we need to pave the way for them.

REFERENCES

1. Gynaecologists R. A.a.N.Z.C.o.O.a. Maternity care in Australia: a framework for a healthy new generation of Australians Melbourne. (2017).
2. Almond D, Currie J. Killing me softly: the fetal origins hypothesis. *J Economic Perspect.* 2011;25:153–72.
3. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience, WHO. (2016).
4. Rising SS. Centering pregnancy. An interdisciplinary model of empowerment. *J Nurse Midwifery.* 1998;43:46–54.
5. Trudnak TE, Arboleda E, Kirby RS, Perrin K. Outcomes of Latina women in CenteringPregnancy group prenatal care compared with individual prenatal care. *J Midwifery Women's Health.* 2013;58:396–403.
6. Rotundo G. Centering pregnancy: the benefits of group prenatal care. *Nurs Women's Health.* 2011;15:508–18.
7. Hunter LJ, et al. Better together: a qualitative exploration of women's perceptions and experiences of group antenatal care. *Women Birth.* 2019;32:336–45.
8. Picklesimer AH, Billings D, Hale N, Blackhurst D, Covington-Kolb S. The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population. *Am J Obstet Gynecol.* 2012;206:e415411–7.
9. Ickovics JR, et al. Group Prenatal Care and perinatal outcomes. *Obstet Gynecol.* 2007;110:330–9.
10. Ickovics JR, et al. Group prenatal care and preterm birth weight: results from a matched cohort study at public clinics. *Obstet Gynecol.* 2003;102:1051–7.
11. Carter EB, et al. Group prenatal care compared with traditional prenatal care: a systematic review and Meta-analysis. *Obstet Gynecol.* 2016;128:551–61.
12. Cunningham SD, et al. Group prenatal care reduces risk of Preterm Birth and Low Birth Weight: a matched cohort study. *J Womens Health (Larchmt).* 2019;28:17–22.
13. Durlak JA, DuPre EP, Implementation Matters. A review of Research on the influence of implementation on Program outcomes and the factors affecting implementation. *Am J Community Psychol.* 2008;41:327.
14. Schaaf M, et al. Unpacking power dynamics in research and evaluation on social accountability for sexual and reproductive health and rights. *Int J Equity Health.* 2021;20:1–6.
15. Allen-Scott L, Hatfield J, McIntyre L. A scoping review of unintended harm associated with public health interventions: towards a typology and an understanding of underlying factors. *Int J Public Health.* 2014;59:3–14.
16. Mumtaz Z. Can Community Midwives establish financially sustainable practices in the private sector? Lessons from the Integrated Afghan Refugee Assistance Program Midwifery Training Project, Baluchistan. (2014).
17. May C. Towards a general theory of implementation. *Implement Sci.* 2013;8:1–14.
18. Damschroder LJ, Reardon CM, Opra Widerquist MA, Lowery J. Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): the CFIR outcomes Addendum. *Implement Sci* 17(2022).
19. Damschroder LJ, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4:50.
20. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated Consolidated Framework for Implementation Research based on user feedback. *Implement Sci.* 2022;17:1–16.



21. Shelton RC, Adsul P, Oh A. Recommendations for addressing structural racism in implementation science: a call to the field. *Ethn Dis.* 2021;31:357.
22. Mielke J et al. Methodological approaches to study context in intervention implementation studies: an evidence gap map. *BMC Med Res Methodol* 22(2022).
23. Hawe P, Shiell A, Riley T. Theorising interventions as events in systems. *Am J Community Psychol.* 2009;43:267–76.
24. Martens N et al. Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. *Implement Sci Commun* 3(2022).
25. Vlassak E, Bessems K, Gubbels J. The Experiences of Midwives in Caring for Vulnerable Pregnant Women in The Netherlands: A Qualitative Cross-Sectional Study. in *Healthcare*, Vol. 11 130MDPI, (2022).
26. Finlay S, Sandall J. Someone's rooting for you: continuity, advocacy and street-level bureaucracy in UK maternal healthcare. *Soc Sci Med.* 2009;69:1228–35.
27. Verschuuren KJC et al. Bottom-up development of national obstetric guidelines in middle-income country Suriname. *BMC Health Serv Res* 19(2019).
28. Glasgow RE et al. RE-AIM planning and evaluation Framework: adapting to New Science and Practice with a 20-Year review. *Front Public Health* 7(2019).
29. Nilsen P. Making sense of implementation theories, models, and frameworks. *Implement Sci.* 2020;30:53–79.
30. The World Bank. Vol. 2023 (The World Bank, 2023).
31. Kallianidis A et al. Confidential enquiry into maternal deaths in the Netherlands, 2006–2018: a retrospective cohort study. (2021).
32. Bahadoer S, et al. Ethnic disparities in maternal obesity and weight gain during pregnancy. The Generation R Study. *Eur J Obstet Gynecol Reproductive Biology.* 2015;193:51–60.
33. Perdok H, et al. Opinions of maternity care professionals and other stakeholders about integration of maternity care: a qualitative study in the Netherlands. *BMC Pregnancy Childbirth.* 2016;16:1–12.
34. Hollander M, de Miranda E, Vandenbussche F, van Dillen J, Holten L. Addressing a need. Holistic midwifery in the Netherlands: a qualitative analysis. *PLoS ONE.* 2019;14:e0220489.
35. NIVEL. Cijfers uit de Nivel-registratie van verloskundigen. (2021).
36. Rijnders M, Jans S, Aalhuizen I, Detmar S, Crone M. Women-centered care: implementation of CenteringPregnancy® in the Netherlands. *Birth.* 2019;46:450–60.
37. Rotterdam G. Aanmeldpunt Moeders van Rotterdam. Vol. 2023 (2023).
38. PAHO. Suriname - Country Profile Vol. 2023. Pan American Health Organization; 2023.
39. Kodan LR, et al. Trends in maternal mortality in Suriname: 3 confidential enquiries in 3 decades. *AJOG Global Rep.* 2021;1:100004.
40. Ministrie van Volksgezondheid. Maternal and Newborn Health Strategy 2021–2025.
41. Housing. M.o.S.A.a.P. Suriname Multiple Indicator Cluster Survey 2018, Survey Findings Report. (2019).
42. Hindori-Mohangoo AD, Hindori MP. Innovatieve zorg rondom zwangerschap en geboorte in Suriname: ervaringen van het Perisur project Paramaribo,. (2017).
43. Martens N et al. Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis. *BMC Pregnancy Childbirth* 23(2023).
44. Beebe J. Rapid qualitative inquiry: a field guide to team-based assessment. Rowman & Littlefield; 2014.

45. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol.* 2013;13:1–8.
46. Goldsmith LJ. Using Framework Analysis in Applied qualitative research. *Qualitative Rep* 26(2021).
47. Terry G, et al. The SAGE handbook of qualitative research in psychology. *SAGE Handb Qualitative Res Psychol.* 2017;2:17–36.
48. Adaji SE, et al. Women's experience with group prenatal care in a rural community in northern Nigeria. *Int J Gynecol Obstet.* 2019;145:164–9.
49. Ahrne M et al. Group antenatal care (gANC) for somali-speaking women in Sweden – a process evaluation. *BMC Pregnancy Childbirth* 22(2022).
50. Andersson E, Christensson K, Hildingsson I. Parents' experiences and perceptions of group-based antenatal care in four clinics in Sweden. *Midwifery.* 2012;28:502–8.
51. Benediktsson I et al. Comparing CenteringPregnancy® to standard prenatal care plus prenatal education. *BMC Pregnancy Childbirth* 13(2013).
52. Craswell A, Kearney L, Reed R. Expecting and connecting'group pregnancy care: evaluation of a collaborative clinic. *Women Birth.* 2016;29:416–22.
53. Teate A, Leap N, Homer CS. Midwives' experiences of becoming CenteringPregnancy facilitators: a pilot study in Sydney, Australia. *Women Birth.* 2013;26:e31–6.
54. Jans S, Westra X, Crone M, van den Akker-van ME, Rijnders M. Long-term cost savings with centering-based group prenatal care. *Midwifery,* 103829 (2023).
55. Novick G, Womack JA, Sadler LS. Beyond implementation: sustaining group prenatal care and Group Well-Child Care. *J Midwifery Women's Health.* 2020;65:512–9.
56. Novick G, Sadler LS, Knafel KA, Groce NE, Kennedy HP. In a hard spot: providing group prenatal care in two urban clinics. *Midwifery.* 2013;29:690–7.
57. Novick G, et al. Perceptions of barriers and facilitators during implementation of a Complex Model of Group Prenatal Care in six Urban sites. *Res Nurs Health.* 2015;38:462–74.
58. Wiseman O, et al. The challenges and opportunities for implementing group antenatal care ('Pregnancy circles') as part of standard NHS maternity care: a co-designed qualitative study. *Midwifery.* 2022;109:103333.
59. Pekkala J, et al. Key considerations for implementing group prenatal care: lessons from 60 practices. *J Midwifery Women's Health.* 2020;65:208–15.
60. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *Annals Family Med.* 2014;12:573–6.
61. KNOV. NZA komt met tarief Centering-based Interactieve Prenatale Groepszorg. Vol. 2023 (2023).
62. Novick G, et al. Women's experience of group prenatal care. *Qual Health Res.* 2011;21:97–116.
63. Phillippi JC, Myers CR. Reasons women in Appalachia decline CenteringPregnancy Care. *J Midwifery Women's Health.* 2013;58:516–22.
64. Andrade-Romo Z, et al. Group prenatal care: effectiveness and challenges to implementation. *Rev Saúde Pública.* 2019;53:85.
65. Kennedy HP, et al. I wasn't Alone—A study of group prenatal care in the military. *J Midwifery Women's Health.* 2009;54:176–83.
66. Connor KA, Duran G, Faiz-Nassar M, Mmari K, Minkovitz CS. Feasibility of implementing group well baby/well woman dyad care at federally qualified health centers. *Acad Pediatr.* 2018;18:510–5.
67. Sayinzoga F, et al. Use of a facilitated group process to design and implement a group antenatal and postnatal care program in Rwanda. *J Midwifery Women's Health.* 2018;63:593–601.



68. Kweekel L, Gerrits T, Rijnders M, Brown P. The role of Trust in CenteringPregnancy: Building Interpersonal Trust relationships in Group-based prenatal care in the Netherlands. *Birth*. 2017;44:41–7.
69. Wagijo MaR, et al. CenteringPregnancy in the Netherlands: who engages, who doesn't, and why. *Birth*. 2022;49:329–40.
70. Nilsen P, Bernhardsson S. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC Health Serv Res*. 2019;19:1–21.
71. Curran GM, Bauer M, Mittman B, Pyne JM, Stetler C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012;50:217.
72. Harvey G et al. Connecting the science and practice of implementation—applying the lens of context to inform study design in implementation research. *Front Health Serv* 3(2023).
73. Volksgezondheid Mv. National Maternal Health and Mortality Reduction Priority Plan. Ministrie van Volksgezondheid; 2019.
74. Mielke J et al. The Basel Approach for coNtextual ANALysis (BANANA) in implementation Science using the SMILe Project as an Example. Presentation at: ESPACOMP (2019).
75. Horton M et al. The SPECTRUM consortium: a new UK Prevention Research Partnership consortium focussed on the commercial determinants of health, the prevention of non-communicable diseases, and the reduction of health inequalities. *Wellcome open Res* 6(2021).
76. Padek MM, et al. Patterns and correlates of mis-implementation in state chronic disease public health practice in the United States. *BMC Public Health*. 2021;21:1–11.
77. Allen P, et al. Perspectives on program mis-implementation among US local public health departments. *BMC Health Serv Res*. 2020;20:1–11.





CHAPTER 5

Implementation of antenatal group care in two Dutch settings

a process evaluation

Submitted at Maternal and Child Health Journal and currently under review.

ABSTRACT

Background

Antenatal group care has been introduced in the Netherlands in 2012. Evidence based interventions, such as group care, can only attain the desired effects when implemented with sufficient fidelity and integrity, yet knowledge on the implementation process of group care and how implementation integrity may impact client outcomes is limited. The aim of this study was to understand how implementation determinants, model fidelity, and outcomes (health care professionals and client experiences) relate to one another.

Methods

Antenatal group care was introduced at two urban Dutch settings. Based on Gresh's conceptual framework the implementation context, fidelity to the three core components of group care (structure, content, process), and outcomes (patient experience and clinician experience) were investigated using a combination of qualitative and quantitative methods (Gresh et al., 2023).

Results

Overall, group care was implemented with high levels of adherence. However, the recommended group size was not reached at both settings. Time management was challenging for midwives from one setting, whereas recruitment difficulties hampered implementation at the other setting. In general, women and midwives were satisfied with group care. However, amongst midwives ambivalence regarding the provider-client relationship and time/energy investment surfaced. Women appreciated peer support and interactive learning but they also indicated that group cohesion was not always achieved and that preparation for parenthood could be more thorough.

Conclusion

This study provides insights into the complex interplay of implementation determinants, model fidelity, outcomes and the underlying mechanisms. However, evidence for the active ingredients of the group care model is lacking, which hampers studying various aspects of fidelity and limits compatibility.

INTRODUCTION

The Group Care (GC) model was developed in pursuit of a woman-centred approach to antenatal care that addresses both medical and psycho-social needs [2]. In this model, groups of six to twelve women participate in regular antenatal care sessions throughout their pregnancy with two facilitators of whom at least one is a healthcare professional (HCP) [3]. Each session includes individual health checks with the HCPs, health self-measurements and interactive group discussions [3]. The stability of group membership is pivotal for establishing trust and fostering social connections among participants [4]. GC provides a dedicated space for women to voice concerns and ask questions that may go unaddressed in traditional care settings, but also emphasizes the importance of recognizing shared experiences and leveraging existing knowledge [4]. By doing so, GC aims to contribute to women feeling less isolated and more empowered [5, 6]. Previous studies found that attendees of GC were, on average, satisfied with care, reporting enhanced readiness for childbirth [7, 8]. Additionally, midwives endorse the less medicalized approach to antenatal care inherent in the GC model and enhanced HCP-recipient relationships were reported by GC facilitators [4, 9]. Health education within this model is believed to mitigate adverse outcomes and although conclusive evidence is pending, indications suggest improved pregnancy outcomes for those in more disadvantaged groups [10-12].

Introduced in the Netherlands in 2012, the GC model is now implemented in approximately 30% of Dutch midwifery clinics [13]. However, knowledge on the implementation process of GC and how implementation integrity may impact client outcomes is limited [7]. Implementation scientists emphasize that evidence based interventions, such as GC, can only attain the desired effects when implemented with sufficient fidelity and integrity [14, 15]. Hence, studying implementation helps explain why end goals, such as improved pregnancy and birth outcomes, are (or sometimes are not) attained. Proctor's taxonomy describes eight implementation outcomes, amongst them fidelity, the extent to which an intervention is implemented as intended [14]. In fact, fidelity is described in most established frameworks for implementation outcomes, including the RE-AIM framework and the CFIR addendum [16-18]. In line with this theoretical background, Novick and colleagues' observational study rationalizes how hampered fidelity to the GC model decreases commitment and satisfaction of HCPs and service users [19]. In their case, in response to low administrative buy-in, four adaptations to the centering-based GC model were made, compromising adherence to the 13 essential elements (see table 1) described by the centering health care institute [20, 21] GC implementation was paused at both clinical settings under study [19] and inspired



the authors to introduce the fidelity-adaptation-debate [15] in the GC literature. Novick and colleagues point out that no empirical evidence supports the claim that these 13 elements are the active ingredients¹ of GC necessary to yield improved outcomes. Lacking consensus on the key ingredients of GC jeopardizes research of implementation and fidelity.

Table 1. Essential elements of GC according to Centering Health care Institute (21)

1	Health assessment occurs within the group space
2	Participants are involved in self-care activities
3	A facilitative leadership style is used
4	The group is conducted in a circle
5	Each session has an overall plan
6	Attention is given to the core content, although emphasis may vary
7	There is stability of group leadership
8	Group conduct honors the contribution of each member

Consequently, Gresh and colleagues conducted a scoping review to identify the core components of GC, specifically group well-child care [1]. Subsequently, to guide and standardize the implementation and evaluation of GC, Gresh and colleagues proposed a conceptual framework for group well-child care applicable to antenatal GC (see figure 1) [1]. The framework is composed of three main pillars. The first pillar, inputs, is based on the Consolidated Framework for Implementation Research (CFIR) [22, 23]. The CFIR is a framework that helps identify contextual factors relevant to implementation of innovations across five domains: inner setting, outer setting, innovation characteristics, individuals’ characteristics and process. Gresh and colleagues categorize contextual factors somewhat differently; inputs groups contextual factors into health system context, administration/logistics, clinical setting, GC clinical team, community/patient population, and curriculum development and training. The core components delineate the GC intervention in terms of structure, content, and process, facilitating fidelity analysis. The core component structure entails several definers, including group size, composition, stability, continuity of patients and facilitators, and frequency and length of visits. Under content Gresh and colleagues list all assessment instruments and clinical services imbedded in GC, while process describes any activities related to interactive learning and community building. Borrowed from the quadruple aim of health care [24, 25], outcomes are organized in terms of potential impacts of

1 The terms active ingredients and core components are used interchangeably

GC on clinical outcomes, patient experiences, clinician experiences, and health system costs and savings.

Guided by Gresh's framework [1] we analysed the implementation process of GC based in two different, albeit similar, antenatal care settings in the Netherlands. Both settings newly introduced GC. The aim of this study was to understand how implementation determinants, model fidelity, and outcomes relate to one another. We sought to answer the following questions:

- To what extent were the three Gresh core components of antenatal GC delivered as intended; And what was the quality of implementation?
- What factors were relevant to the implementation/fidelity of GC?
- How did HCPs experience the implementation of GC?
- How did women experience GC?

METHODS

Study design and setting

This study is embedded in the Horizon2020 project “Group Care during the first 1000 days” (GC_1000). Within GC_1000, GC is implemented/scaled up in seven countries and process analyses are conducted [26]. The GC_1000 programme used an interpretive case study design, with mixed methods data collection. The Medical-Ethics Review Committee Leiden Den Haag Delft granted approval for the Dutch part of this study.

Two midwifery practices (practice A and practice B) in Rotterdam were selected in collaboration with the municipality of Rotterdam as implementation sites. A numerous and diverse patient population and support from an implementation team from the municipality of Rotterdam and the national programme ‘promising start’ (Kansrijke Start) rendered these sites suitable for inclusion in GC_1000. Midwives from both settings followed a mandatory two-day GC training and three feedback sessions with a GC consultant. The municipality also arranged inter-vision sessions for midwives from various practices.

Participants and sampling

Midwives and women were purposively sampled at the two implementation sites due to their respective roles of “GC facilitator” and “GC participant”. Hence, criterion-i-sampling was applied [27]. Before each interview the purpose of the study was explained, questions were addressed and informed consent was obtained.



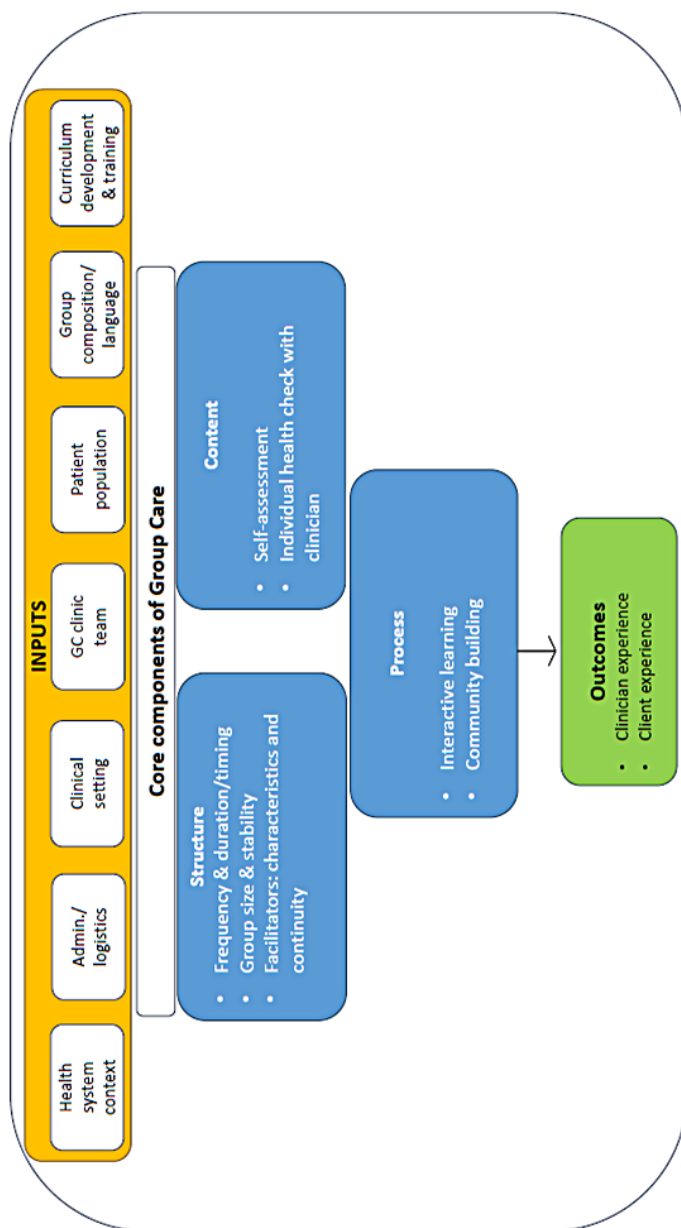


Figure 1. GC conceptual framework adapted from Gresh (1)

Data Collection

Based on Gresh's conceptual framework [1], the implementation context (inputs), fidelity to the three core components of GC (structure, content, process), and outcomes (patient experience and clinician experience) are investigated using a combination of qualitative and quantitative methods.

Qualitative methods

Semi-structured interviews were held with women and with one midwife between December 2021 and October 2023. Furthermore, one focus group (FG) with midwives was conducted at each setting. Depending on feasibility data was collected online, or face-to-face. Topic guides for interviews and FGs were based on a previous study [28, 29] and adapted where needed. Except for one interview in English, all focus groups and interviews were conducted in Dutch. The interviews lasted between 20 and 35 minutes, and the two focus group interviews lasted 57 and 74 minutes. Moreover, a researcher attended four GC sessions at setting A and six sessions at setting B and made observation notes. The researcher observed one group twice: the first observation was a second or third session and the second observation a session eight or nine. All qualitative data sources are used to study inputs and fidelity. Focus group and data from interviews with midwives are used to investigate the HCP's experience. Women's experience with GC was researched based on semi-structured interviews held with women as well as interviews and focus groups with midwives, see table 2 for an overview.

Quantitative methods

After each session, midwives filled in a questionnaire, the self-evaluation form (SEF), to register how and to what extent GC was implemented as intended. The SEF was based on a previous study [29] and adapted to context characteristics. In addition, the researcher who observed GC sessions made observation notes and filled in a checklist, the model fidelity form (MFF), to score the extent to which GC was implemented as intended. The MFF was developed by Group Care Global, a non-profit organization dedicated to promoting the Centering-based group care model internationally. Items from MFF and SEF were mapped onto the three core components of GC [1], see appendix A, and complemented with qualitative data to study fidelity. Basic information on the implementation sites (such as number of employees) was obtained using a short online survey.

Document analysis

Relevant peer-reviewed articles and reports were identified through an online search, including:

- Rijnders, M., Jans, S., Aalhuizen, I., Detmar, S. & Crone, M. Women-centered care: Implementation of CenteringPregnancy® in The Netherlands. *Birth* 46, 450-460 (2019).
- Perdok, H., et al. Opinions of maternity care professionals and other stakeholders about integration of maternity care: a qualitative study in the Netherlands. *BMC pregnancy and childbirth* 16, 1-12 (2016).
- Hollander, M., de Miranda, E., Vandenbussche, F., van Dillen, J. & Holten, L. Addressing a need. Holistic midwifery in the Netherlands: A qualitative analysis. *Plos one* 14, e0220489 (2019).
- R. Kenens & Batenburg, R. *Cijfers uit de Nivel-registratie van verloskundigen*. (Nederlands Instituut voor Onderzoek van de Gezondheidszorg, Utrecht, 2021).

The selected documents were searched for input factors as described by Gresh (1) and health system determinants were extracted from these documents.

Data Analysis

Audio recordings of interviews and focus groups were transcribed in verbatim. Both transcripts and observation notes were coded inductively and deductively using Atlas.ti software. Two previously developed code books, one for interviews with women and another one for interviews with midwives, were used for deductive coding. The coded data was then thematically analysed using framework method [30]. Data were summarized in matrices where rows corresponded to cases (i.e., interviews, or focus groups) and columns to codes, allowing for identification of patterns and comparison between cases. Quantitative data was analysed using descriptive statistics in IBM SPSS software. The SPSS output is used to quantify, complement and triangulate qualitative findings.

Table 2. Research instruments

Pillar	Construct	Sub-construct	Data source / analysis						
			Quantitative				Qualitative		
			OS	SEF	MFF	OBS	MW	W	DA
Input	Health system context								x
	Admin logistics			x	x	x	x		
	Clinical setting etc.		x						
	GC Clinic team		x						
Core Components	Patient population						x		
	Structure/fidelity								
		Frequency and duration/timing							
		Group characteristics		x		x	x		
		Facilitator characteristics		x	x				
		Continuity of facilitators		x	x	x			
		Self-assessment		x		x			
	Content	Health checks		x	x	x	x		
		Interactive learning		x	x	x			
	Process	Community building		x	x	x		x	
Outcomes	Clinician experience						x		
	Client experience	Social Support					x	x	
		Preparedness					x	x	
		Empowerment					x		
		Satisfaction with care					x	x	

OBS – observation notes; MW – FGD and Interviews with midwives; W – FGD and Interviews with women; DA – document analysis

RESULTS

In total, 10 sessions were observed, and 10 mode fidelity forms were completed. Midwives assessed 92 sessions using self-evaluation forms. In total, 10 midwives participated in focus groups, and one midwife and five women were interviewed individually. Table 54 outlines how determinants are linked to fidelity aspects of GC. CFIR domains were used to structure this table, while detailed findings on fidelity/quality and outcomes are presented in three sections in line with Gresh's framework: inputs, core components and outcomes.

Table 3. Number of participants, responses and observations

Description	Number of participants practice A (duration in minutes)	Number of participants practice B (duration in minutes)	Total
Midwives FGD	4 (74)	6 (57)	10
Midwives individual interview	0	1 (35)	1
Women individual interview	3 (22; 30; 30)	2 (26; 20)	5
Number of observed sessions	4	6	10
Responses on MFF	4	6	10
Responses SEF	32	60	92

Table 4. Determinants of fidelity and underlying mechanisms

Determinant	Related fidelity-aspect		PROCESS	Mechanisms	Quotes
	STRUCTURE	CONTENT			
Innovation domain					
Complexity/ Recruitment	Group size	Health Check/ time	Interactive learning	Recruitment challenges linked to small group size in Practice A, but not in Practice B Recruiting challenges in Practice A: time, energy, discomfort Methods taught at recruitment training partially deemed inappropriate (Practice A) midwives who had not followed GC training less eager to recruit (Practice A) Recruitment multiparas challenging: lack of childcare; novelty of GC (Practice B) Time pressure during health check amplified in large groups and possibly in separate rooms (Practice B) Group size of 10-12 needed for cost- effectiveness Engagement dependent on group size: lethargic discussions in small group (Practice A)	Sometimes I feel like a bit of a stalker: do you want to join? Then they don't come and then I call again and say: do you want to, do you not want to? I don't like that part as much, but hey, that's part of it. FG Practice A A. [GC trainer] suggested to say that we need to check whether the group is full. I noticed that this led to resistance, because it is not true. I worked commercially for a while myself, so it doesn't matter to me as long as they sign up. However, midwives are used to providing care. They're not going to say that. FG Practice A You nearly do not dare to ask how it is going because you do not actually have time for this in three minutes. FG Practice B Yes, again, things didn't really get off the ground for us. Okay, so it was done interactively, but I thought we were a bit silly, we did the assignment in a sort of neat manner. There was never really a discussion or anything like that. Woman Practice A
			Interactive learning	Delicate (e.g., mental health), technical (e.g., birthing equipment), and bio/medical topics linked to didactic facilitation style (Practice A, Practice B)	
Complexity/ Information content					



Determinant	Related fidelity-aspect		Mechanisms	Quotes
	STRUCTURE	CONTENT	PROCESS	
Complexity/ Group composition			Disparate views amongst women: cultural diversity linked to both poor group cohesion and connectedness (Practice A) Disparate views amongst midwives: diversity linked to weak group cohesion and to empowerment (Practice B) Variation in gestational age not ideal: information need varies with different phases of pregnancy (Practice A)	<i>So I had very nice contact with that woman and I thought it was interesting to hear what they thought, but I didn't have a very strong idea of us being a group or anything like that. Woman</i> Practice A <i>It was like an eye opener, like what it can do if you put different women together with different backgrounds. But they shared the same care for the babies, and it was really nice and special to see that this woman who doesn't have a voice in society because of her issues and that she had a voice in this group and that she could share her story for the benefit of the whole group. INT</i> Practice B
Inner setting domain				
Resources/ Funding	Facilitator characteristics		In both settings, one midwives and one assistant or lifestyle coach facilitated groups, instead of two midwives, to reduce costs.	
Resources/ Space		Health check/ set-up	Physical space determined set-up of health checks (as described under inputs/administration and logistics)	

Determinant	Related fidelity-aspect		Mechanisms	Quotes
	STRUCTURE	CONTENT		
Individuals domain				
Deliverer/ Motivation & Skills	Continuity of facilitators		One midwife stopped facilitating groups as she did not feel comfortable in the facilitator's role (Practice A)	A is normally a nice chat and quite outgoing, but (...) even when we discussed very carefully which part she would do, it seemed as if she had some kind of stage fright. She just didn't enjoy it. I think it is mainly important that you find this a lot of fun to do and she didn't think so (...) Then I broke all the Centering rules and hosted a session with a student who was super excited about it. That went really well (...) I think enthusiasm is more important than stability in the group. FG Practice A
Deliverer/ Skills		Communi- ty building	Women reported that midwives encouraged them to and praised them for sharing delicate information or questions. One woman added that that no one felt excluded in her group because everyone was encouraged to participate.	She ensured that everyone was reassured and could ask questions, that nothing was too crazy to ask. INT woman Practice B
Deliverer/ Professional role identity	Duration	Health check/ Timing	Adherence to allocated time for entire GC session dependent on amount of time spent on health checks Incongruence between role of GC facilitator and midwives' professional identity: some midwives felt less connected with women in GC due to reduced one-on-one time. midwives who did not experience compromised relationship argued that problem is rooted in adaptation to new role (Practice B).	I think you're making your own role too important. Then you feel the need to have that contact with them. Instead of conversations with you, they have conversations with pregnant women and they can share a lot with each other, so I think that has so much added value, but it may take some getting used to for yourself, because you indeed build up that personal part less. But I think what they get in return is really valuable. FG Practice B

Determinant	Related fidelity-aspect		PROCESS	Mechanisms	Quotes
	STRUCTURE	CONTENT			
Deliverer/ Skills/ Time management		Interactive learning	Observer noted didactic facilitation style when time was constrained (e.g., beginning of sessions facilitative style and towards end more didactic style).		
Deliverer/ Skills/ Activities in small groups		Community building	Observer noted strong interaction between women during activities in small groups (Practice B) Woman explained that activities in small groups facilitated getting to know peers		
Recipients/ Responsiveness		Interactive learning	Midwives retreated to a more didactic facilitation style when many questions were asked, or when group was less responsive (Practice A)		You bounce the question back but there is no response. Then you fill it in yourself. If you've said about ten times, "What do you think? What do you know?" it feels a bit childish to say this again for the eleventh time. FG Practice A
Recipients/ Stage of change		Self-assessment	Midwives from both settings reported high acceptability and no difficulties with self-assessments amongst women		
Recipients/ Language		Community building & Interactive learning	Midwives reported that translation slowed down entire GC session (Practice B), yet other midwives (Practice A) reported that running groups bilingually was unproblematic (English and Dutch). Women reported that language preferences divided the group, excluding those less fluent in Dutch, and that at least one facilitator lacked English language skills (Practice A) Observer noted that written materials and exercises were not translated beforehand		We switched almost completely to English, but that also excluded one or two women a bit. INT woman Practice A

Determinant	Related fidelity-aspect		Mechanisms	Quotes
	STRUCTURE	CONTENT		
Outer setting domain				
Cultural events & Growth echo	Group (in) stability/no shows		No-shows more frequent in GC; particularly when GC sessions collide with cultural events, or when scheduled shortly after the growth echo. Once women miss at least two consecutive sessions, connection is lost and they will likely stop GC.	<i>A few months ago it was Ramadan and my group fell just at the time they were supposed to start gathering with family for iftar. So I say: fine, then we will adjust the time, because we had everything planned in advance. So we just adjusted the time. And then the people who go to iftar for the gatherings during Ramadan don't show up. Then you have adjusted the time and your agenda for those people and apparently people do not find it important to come anyway (...) You also do not want to give a kind of feeling that it is obligatory, then it becomes a kind of forcing. FGD Practice B</i>



1. Inputs

Healthy system Context

Both midwifery clinics are embedded in the Dutch health care system. The Netherlands's distinctive maternity care system relies primarily on midwife-led care [31]. Primary care midwives provide antenatal, labour and postnatal care for all women with low-risk pregnancies, while hospital-based midwives provide labour care for those with high-risk pregnancies [32]. The majority of primary care midwives operate within independent group practices, adhering to a standard of individualized provider-to-user care [13, 33]. Typically, women undergo a series of twelve antenatal appointments, each lasting fifteen minutes, following a structured '4-3-2-1' scheduling scheme, where numbers indicate appointments spacing in weeks [13]. In instances of complications during pregnancy, childbirth, or postpartum, women are referred to secondary care [13, 32]. Basic health insurance packages cover costs for antenatal care. The reimbursement scheme is based on a lump sum HCPs receive per patient and no specific rate for GC was in place at time of interviewing [34].

Administration/Logistics

In practice A, GC sessions took place in a dedicated, private room. In practice B, GC was held at the reception area of the practice that allowed for sitting in a (not perfectly round) circle, however when the group was larger not all women were able to see one another. The observer noted that the space was consistently conducive to group sharing and sufficiently private in most observed sessions in practice B and in all session in practice A. However, in practice A during half of the observed sessions another midwife accessed the room to collect items. Drinking water and snacks were available in all observed sessions at both settings.

Clinical Setting

Both settings are primary care midwifery practices. Eleven midwives and three practice assistants work at practice A. Practice B consists of seven staff members (six midwives and one practice assistant).

GC Clinic team

At practice A six midwives followed the GC training and the rest of the team did not. At practice B all seven staff members followed the GC training. Tables 6 and 7 describe the teams of midwives.

Table 5. Teams of midwives practice A and B

Practice	Age	GC training followed	Runs groups	Years of midwifery experience	Function
A	40	No	No	18	Owner
	53	No	No	26	Owner
	36	Yes	Yes	9	Owner
	40	No	No	19	Freelance
	35	No	No	12	Freelance
	35	No	No	12	Freelance
	38	Yes	Yes	18	Freelance
	40	Yes	Yes	13	Freelance
	29	Yes	Yes	2,5	Freelance
	28	Yes	Not started yet	6	Freelance
	29	Yes	Not started yet	7	Freelance
B	43	Yes	Yes	20	Owner
	40	Yes	Yes	19	Owner
	39	Yes	Yes	17	Owner
	37	Yes	Yes	16	Owner
	26	Yes	Yes	4	Freelance
	26	Yes	Yes	5	Freelance

Patient population

Both practices are located in ethnically diverse and/or ‘disadvantaged’ neighbourhoods in the suburbs of Rotterdam. Midwives report that the majority of women they serve have a migration background (second or third generation). Social issues, such as financial struggles or housing problems are frequent amongst their clients, according to midwives. Practice A serves 750 clients of which 20% are considered as having “vulnerable”¹ circumstances. Practice B serves 320 clients of which 40% have “vulnerable” circumstances.

Group composition & languages

Midwives from practice A described their groups as diverse in terms of ethnicity and cultural background, yet homogeneously composed of women with higher socio-economic status (SES). Midwives from practice B agreed that their groups were diverse concerning cultural background and socio-economic status. While

1 For the purpose of this research, de Groot and colleagues’ definition of vulnerability was adapted to: ‘Vulnerability is a dynamic state that reflects converging effects of a set of interacting and amplifying personal, environmental and structural factors, where risk factors outweigh protective factors leading to enhanced susceptibility to adverse health outcomes in the first 1000 days and hampering recovery.’

bilingual groups (Dutch and English) were offered at practice A, GC was solely offered to women with sufficient Dutch language skills at practice B.

Curriculum development and training

Both settings implemented the GC model proposed by Stichting Centering.²

2. Core components

2.1. Structure

Frequency and duration/timing

The GC format used at both settings consists of nine antenatal and one postnatal GC session. At practice A, sessions lasted on average 119 minutes (SD=8.53) and at practice B sessions lasted on average 122 minutes (SD=8.4). At both settings all sessions are reported of starting on time, and whereas most sessions were reported to end on time at practice A, three-quarter of sessions ended on time at practice B.

Group size & stability

At practice A, on average four women attended (SD=1.6) and at practice B the mean group size was six women (SD=2.2). At practice B about one-third of GC sessions reached the recommended group size of 8-12 women and at practice A none did.

At practice A, group cohorts were somewhat unstable. The observer noted that the composition of group members changed between sessions, which midwives confirmed. At practice B, group members were consistently present throughout all observed sessions, yet in the focus group midwives explained that hardly any woman attended all 9 antenatal sessions.

Facilitator characteristics and continuity of facilitators

At both settings at least one of the facilitators was a medical professional (midwife) in all sessions. In general, two fixed facilitators were present for the entire session at practice B, and at practice A the facilitators remained the same from the first to the last session in three quarters of the groups and in all observed sessions the facilitators were present for the entire length of the session.

2 Stichting Centering Nederland is responsible for implementation, training, quality development and development of CenteringPregnancy, CenteringParenting and CenteringDiabetes in the Netherlands. More information can be found on the website: <https://centeringzorg.nl/centeringpregnancy/centeringzwangerschap-informatie/>

Structure

overall both settings did well on timing, although midwives from practice B went over time more often than midwives from practice A. Both settings did not reach the recommended group size. Practice A had smaller groups than practice B and struggled more with stability of clients. Facilitators were stable in both settings, but at practice A not as stable as at practice B

2.2. Content***Self-assessments***

Self-assessments, namely blood pressure and weight, were taken by all women in most sessions (93.8%) at practice A and at practice B they were taken in all sessions by all women. No difficulties were observed.

Health check

At practice A women were examined on an examination table, behind a screen located in a corner of the same room where all other GC activities took place. At practice B Individual health assessments took place in separate rooms with an open door. Both midwives conducted individual assessments simultaneously during observed sessions at practice B, however all health checks combined still took longer than the allocated 30 minutes in four out of five observed sessions. Adherence to the recommended time frame of three to five minutes per patient was rarely achieved at practice B. The mean time for individual health assessments at practice B was 6.2 min (SD=1.6). Focus group data paints a similar picture: midwives from practice B discussed their struggle to conduct individual health assessments in the allocated time frame. However, time management during one-on-one moments was not problematic at practice A, according to midwives. While in two out of four observed sessions at practice A health checks lasted longer than the allocated time, midwives indicated to conduct health assessments in the allocated time frame in most sessions (67.9%) with an average duration of 5.38 minutes (SD=1.83).

Content

self-assessments went very well at both settings. Recommendations for physical set up for health checks were adhered to at practice A, whereas at practice B health checks were conducted in a separate room. Time management for health checks was a major concern for practice B. At practice A, where groups were smaller and health checks took place at the same room as all other GC activities, time management was not a problem



2.3. Process

Interactive Learning

At practice A, incongruities between the midwives' judgement and the observer's ratings emerged; While midwives indicated to always have used interactive opening and closing exercises, the observer reported opening exercises in three of four sessions and closing exercises in one of four observed sessions. At practice B a variety of opening and closing exercises was used: with interactive openings always being used while interactive closings in three quarter of the sessions.

At both settings, midwives reported using activities that encourage interaction and consistently applying all interactive skills: responsiveness to women's needs, listening skills, and open questions. Women from both settings confirmed that midwives did not answer questions directly but instead redirected them to group members and that sufficient room for questions was made.

At practice A midwives reported to have applied an interactive facilitation style rather than a didactive style in most sessions (81.3%), and the observer rated the facilitation style 7.5 in terms of interaction on a scale of 0-10. At practice B the observer rated the facilitation style 6.6 in terms of interaction. This rating was complemented with notes describing instances where midwives could not engage all clients in the discussion. midwives from practice B indicated to have used a rather facilitative than didactive facilitation style in about two third of the sessions and the observer noted efforts to use a facilitative style in every session, including bouncing questions back to the group, encouraging women to participate, thanking and praising woman for sharing own experiences. Moreover, women were encouraged to think for themselves and to make informed decisions based on personal preferences.

However, the observer also noted instances of didactive facilitation at both settings and one midwife from practice A reported avoiding extensive discussions. Moreover, at practice A the observer reported one instance where a women's concern regarding mental health was not responded to. Nonetheless, women who participated in GC at practice A reported sufficient room for questions and concerns, especially when emotionally charged.

Sessions were prepared and reflected upon at practice A and practice B.

Community Building

At both settings, time for informal interaction was always allocated during breaks. Midwives from both settings rated the level of engagement and connectedness of the women as very high in most sessions: they shared ideas, feelings and/or experiences. The observer rated the average degree of connectedness and involvement of women as 7.5 on a scale from 0-10 at practice A and 7.7 at practice B.

At practice A the observer noted that emotionally charged information was disclosed in all observed sessions (e.g. fear to fail as mother, own experience with depression), indicating a degree of trust, and that women seemed to have formed a bond. On the other hand, women did not always react to their peers' emotional disclosure. While one woman who participated in GC at practice A reported that midwives created a safe space where everything could be shared, another woman described that initially it took courage to raise more private questions (e.g., regarding nipple piercing and haemorrhoids); to which peers eventually responded with humour and relief. Nonetheless, two out of three interviewed women who participated in GC at practice A reported poor group cohesion.

At practice B trust was most evidently noted by researchers in the last GC session, where women who felt emotional shared their feelings while peers comforted them. Both interviewed women who participated in GC at practice B described an open atmosphere where they felt comfortable to ask delicate questions.

Process:

at both settings facilitation skill were used to enhance interactive learning. However, at both settings, midwives occasionally slipped into a more didactic style. Both, ratings for interactiveness from observer and from midwives are slightly favourable for practice A than for practice B. However, it is not clear if ratings reflect actual facilitation skills or strictness of raters. Overall, women seemed to be engaged and connected at both settings with some indications of trust. However, instances of poor group cohesion were reported at practice A.

3. Outcomes

Clinician and client experiences are illustrated with quotes in table 8.

3.1. Clinician Experience

Views of the model & comparison with standard care

A midwife from practice B expressed having initially opposed the idea of GC and that the facilitator training convinced her of the model before GC introduction at her setting. Midwives from practice A reported more one-on-one time with patients and listed time gain as a major advantage of GC compared with standard care. Midwives from practice B expressed enthusiasm as well as concerns regarding GC. Whereas some midwives from practice B pity women in standard care due to relatively little information provision, others fear to compromise quality of care and the patient-provider relationship in GC due to time constraints for the individual health check (as described above).

Role of facilitator

Except for one facilitator who stopped because she felt uncomfortable in her new role, midwives from both settings agreed that facilitating GC is enjoyable overall. However, a midwife from practice B explained that creating a pleasant atmosphere in one-on-one sessions is relatively easy, whereas in GC, while feeling responsible for the group dynamic, the atmosphere is dependent on all group members and hence steering it is more challenging. Midwives from practice B explained that their facilitation experience varied between groups but generally over time becomes more enjoyable, as midwives and clients get to know one another. Midwives from practice B agreed that GC costs more time and energy than one-on-one care: GC demands uninterrupted focus for up to three hours (including preparation and evaluation).

Continuation of GC and recommendations for the future

Both settings will offer GC and standard care in the future. Midwives from practice A argued that their patient population was too large and diverse to offer GC exclusively; it is not a good fit for every client according to midwives. Midwives from practice B suspected to lose clients if GC was the default model of care, whereas a choice between two different models of care would be valued. Furthermore, the taxation of GC on their energy levels prevented midwives from practice B from offering GC exclusively.

Midwives from both settings emphasized that a reimbursement scheme for GC is needed to sustain and expand GC as the higher costs associated with GC are a burden on midwifery practices. Higher costs for GC were linked to group size,

renting an external location, overuse of care (additional appointments between GC sessions) and at practice B GC sessions were organized at the reception area, which hampered scheduling standard care appointments for other women during GC sessions.

Moreover, inspired by reflection sessions with other midwives, the idea to set up a buddy system where midwives new to GC can learn from experienced GC facilitators was proposed by midwives from practice B. Finally, according to midwives from both settings, GC is still a novel concept to most clients and increasing the visibility of the model would potentially ease recruitment.

3.2. Client Experience

Social Support

Women and midwives from both settings reported that women supported one another in various ways, such as emotional support, information exchange, material support, and companionship. Differences in the extent to which social support developed were acknowledged by midwives and women from both settings. While one woman reported to have developed a close friendship through GC, another woman explained that her connection with GC peers was based on the shared experience of motherhood, rather than being an intimate friendship.

All interviewed women were still in contact with one or more group members, yet two women explained that staying in contact was more difficult once everyone returned to work. Living in the same neighbourhood facilitated interpersonal contact.

Preparedness and empowerment

Midwives from both settings reported enhanced health knowledge amongst women. Midwives and a woman from practice B explained that encouraging women to take more agency in medical decisions increased preparedness for birth and reduced anxiety. Yet, while satisfied with the preparations for giving birth, two interviewed women from practice A indicated that they did not feel sufficiently prepared for the postnatal period. Interviewed women appreciated knowledge exchange with peers; they exchanged tips on pregnancy-related discomforts, such as morning sickness, but also on the use of alternative medicine and traditional remedies.

Midwives from both settings claimed that GC helps women realise what they know already and recognise that insecurities are common during pregnancy. This empowering effect is complemented by an enlarged feeling of responsibility for one's own pregnancy, explained midwives.



Table 8. Outcomes with illustrative quotes

Outcomes	Quotes	
Clinician	Client	
Views of the model & comparison with standard care		<i>I especially like that the time pressure disappears. Normally you have one-on-one checks. You have fifteen minutes for that. Very often that is sufficient, but sometimes there are cases where you think: I need more time for this. Then you end up running late and then you start working in a hurry. You don't have that with Centering. That is what is especially nice about facilitating the Centering group. FGD practice A</i>
		<i>It [GC] has made my job a lot more enjoyable. FG practice A</i>
Role of co-facilitator		<i>I am really pro Centering, but I am also happy that one-on-one care still exists. Because not everyone feels suitable to participate in the Centering group. FG practice A</i>
Continuation		<i>That was very bizarre and surreal, and that you find support from people you actually don't know at all and that really helped you get through the lows in the sessions. Woman practice A</i>
	Social support	<i>So what we see is that there is during the meetings, there's developing a , how do you say , the motherhood or a sisterhood. That people are not alone anymore, but they are together. They support each other. INT with Midwife practice B</i>
	Preparedness	<i>(...) a realistic picture that you create of how it all works. What is normal? And that it is not all roses and moonshine. FG practice B</i>
	Empowerment	<i>(...) and it's almost like she came out of her chair (...) I saw her literally growing because she knew something which she could share with the other ladies who were there in the group. INT with midwife practice B</i>
	Satisfaction with care	<i>Different people get different things out of it. FG practice B</i> <i>(...) in the back behind a semi-modest screen but that is done very quickly and you hear all the noise from the rest of the room and you don't have that much privacy and I always get the feeling I have to hurry a bit because there are still six women and their partners waiting behind your screen (...). INT woman practice A</i>

Satisfaction with care

Midwives and women from both settings reported scepticism towards GC at first. Yet, generally once women joined GC they appreciated it, according to midwives and women from both settings. Peer learning, expansion of the social network, interactive learning methods and encouragement to form own opinions were amongst the factors contributing to a positive GC experience. Indeed, GC exceeded the expectations of four out of five interviewed women from both settings and they were eager to recommend GC. Nonetheless, one woman from practice B would not join GC again (as novelty has worn off) and midwives from practice B contemplated the mixed experiences of highly educated women in diverse groups: ranging from high to low satisfaction. At practice B, one high SES client transferred back to standard care as she did not gain new insights in GC. Contrarily, other high SES clients were interested in the experiences of their peers, appreciated being part of a group and gaining information from reliable sources. Perception of the one-on-one health checks also contributed to satisfaction with care: one woman thought that health checks were rushed, and that privacy was lacking, whereas another woman was less anxious about health assessments in a group setting as they were not the only focus of attention. Both women participated in GC at practice A.

DISCUSSION

This study provides insights into implementation determinants, model fidelity, and women's and facilitators' experiences. At both settings, GC was implemented with high fidelity. Yet, room for improvement regarding recruitment, time management and facilitation style were identified. While midwives and women were overall satisfied with GC, challenges such as increased workload and poor group cohesion were also mentioned.

Based on our data we cannot directly link midwife and client experiences to level of fidelity, however our findings provide some insight into their interplay. The example of group size can illustrate the interconnectedness of context, fidelity and outcomes: perceived complexity of recruitment (implementation determinant) influences group size. Group size (a definer of the core component structure) in turn impacts the GC process: a small group size may lead to less interaction and may contribute to poor group cohesion. Group size also affects time management and costs, although in distinct manners: a larger group is beneficial for cost-effectiveness (outcome), yet it hampers time management during health checks (core component/content); and vice versa.



Overall, interviewed women from both settings were satisfied with GC, which corresponds to previous findings from the Netherlands [35] and to findings of a recent systematic review on client satisfaction based on 19 international studies [7]. The reasons for high satisfaction identified in our study reflect review findings; they both point towards active involvement of women in medical decision-making, peer support and interactive learning [35].

Nonetheless, two out of five interviewed women indicated that they were not sufficiently prepared for the postnatal period by GC. For instance, women lacked information on their own bodily changes and tools to handle conflicting parenting advice. Similarly, in Wedin and colleagues' pilot study [36], a need for more (and less conflicting) information regarding postnatal topics (such as breastfeeding) was identified. Thorough preparation for pregnancy, yet insufficient preparation for parenthood in GC was also found by Andersson and colleagues [37]. These two studies also found higher satisfaction in standard care than in GC, which suggest that thorough preparation for parenthood is pivotal for satisfaction with GC. Moreover, at practice A where groups were held bilingually, language confounded the GC experience of some women who reported diminished cohesion and exclusion of those women who were not fluent in Dutch. Hence, in contrast to Hunter and colleagues' claim that language barriers are not a barrier to providing effective GC their call for diverse groups [28], we found that language incompatibility hampers community building, a core component of GC. If groups are bilingual, materials in both languages need to be prepared. Facilitators with sufficient language skills in both languages and additional measures to ensure group cohesion are also strongly recommended.

In our study, ambivalence regarding the inclusion of diverse groups emerged. While midwives argued that diversity of group members can have an empowering effect, especially for more 'vulnerable' women, they also explained that women of high SES may not gain additional insights in such constellations. Tailoring discussion content to divergent educational levels appears to be challenging.

A previous study that did not find the anticipated positive outcomes for GC clients partially linked their results to population demographics, arguing that GC yields improved outcomes and satisfaction amongst disadvantaged groups but not necessarily amongst Caucasian mothers in their thirties [38]. Potentially those women of high SES may benefit more from a tailored GC model, focusing on specific topics such as balancing career and motherhood, perfectionism and postnatal depression, while, as previously suggested, clients in vulnerable situations can

potentially benefit most from GC [39, 40]. However, from on-going exchange with the two Dutch settings included in this study, we know that - despite being located in disadvantaged neighbourhoods and despite great effort - the inclusion of 'vulnerable' clients remains challenging. Wagijo and colleagues found that women with less pregnancy knowledge and women with a poor lifestyle are less inclined to sign-up for GC [41]. The authors hypothesize that those women fear being judged by their peers but effective recruitment strategies to enrol such women in vulnerable situations have yet to be developed [41].

Indeed, recruitment was a main implementation challenge at setting A and it is a common barrier to GC implementation [19, 42-46]. Midwives at practice A experienced recruitment as time and energy intensive. At practice B, where all midwives followed the GC training, recruitment was less challenging. Potentially, GC training increased buy-in and hence facilitated recruitment. However, midwives at practice B described GC as more taxing than standard care and some - but not all - experienced compromised HCP-client relationships. Nonetheless, most midwives from both settings enjoyed providing GC. A recent systematic review of providers' experiences with GC reports similar findings [9]. Lazar et al. (2012) also found that facilitators were satisfied, especially as GC enabled them to offer personalized, supportive, high-quality care, but also highlighted similar barriers. Opposing the experience of midwives from practice B and in agreement with midwives from practice A, the review reports richer use of time in GC, and in contrast to the ambivalence amongst midwives who participated in our study, enhanced provider-client relationships were consequently reported [9].

Moreover, satisfaction of HCP and women is impacted by fidelity with the GC model, according to Novick [19, 47]. Her implementation study in two urban American settings demonstrates how adaptations made to the GC model (in response to lacking resources) eventually reduced attendance, group size, cohesion and enthusiasm [19]. Moreover, in another study Novick and colleagues demonstrate that fidelity measures are negatively associated with preterm birth rates and utilisation of intensive care [47]. However, Novick also emphasizes that the active ingredients of GC have not been identified, yet; sufficient empirical evidence for the effect of certain elements on specific outcomes is not available thus far. Other researchers agree research that identifies and operationalises the GC core components (i.e., active ingredients), and that proposes measurement instruments, is urgently needed [7].



While it is indeed important to identify the active ingredients of GC and to develop tools for the assessment of fidelity, quality measures should not be forgotten. In fact, quality is considered an aspect of fidelity, next to four other aspects: adherence to the intervention, exposure/dose, participant responsiveness, and programme differentiation [48]. In the present study, findings on fidelity are presented per GC core components according Gresh [1] and a distinction of the various aspects of fidelity was not made explicit. However, amongst other aspects of fidelity we report exposure under the core component structure, and various fidelity aspects of the core component process were investigated. For instance, adherence with interactive learning was assessed with self-report measures (indicating if interactive skills were used or not), while quality was rated by the observer on a scale from 0-10. Adherence with interactive learning was very high at both settings but quality measures indicate room for improvement, particularly at setting B. Admittedly, it is not clear if higher quality ratings for practice A reflect actual facilitation skills or inconsistencies amongst raters. Notes on observation forms that are less positive for practice A point to the latter.

Implications

- GC training should teach midwives how to cater discussion content to women of divergent educational levels
- Facilitators need to prepare materials in both languages if group is bilingual. Facilitators with sufficient language skills in both languages and additional measures to ensure group cohesion are strongly recommended.
- Adapt content to prepare women more for parenthood
- Investigate how to include women from 'vulnerable' situations in GC

Limitations and strengths

Multiple observers and interviewers collected data. To limit potential methodological bias researchers were trained on the use of research tools and they compared their observation notes. Moreover, GC core components were not operationalised prior to investigation. Instead, existing research tools were used and, after extensive discussions, items of multiple surveys were combined and linked to core components retrospectively. However, the mixed-methods design and triangulation of various data sources allowed for thorough investigation of GC implementation. While this study does not significantly further the research on active ingredients of the GC model, we applied a recent framework to systematically report how GC was implemented.

Conclusion

This study illustrates how GC was implemented in two Dutch settings and it provides insights into determinants, outcomes and their interplay. Limitations in the field of GC research are also discussed. Operationalisation of GC components is lacking and identification of the active ingredients of the GC model requires more systematic analysis. The investigation of GC core components using an appropriate research design, such as intervention component analysis [49], is highly recommended. The current study identified definers that were pivotal for the implementation of GC in two Dutch settings, and it hence made a first step towards this goal. An attempt at linking contextual factors, fidelity aspects and outcomes was also made. However, more research in the spirit of realist evaluation is needed to understand the mechanisms connecting specific contextual factors and the GC model (including fidelity measures) to specific outcomes [50].



REFERENCES

1. Gresh A, Wilson D, Fenick A, Patil CL, Coker T, Rising SS, et al. A Conceptual Framework for Group Well-Child Care: A Tool to Guide Implementation, Evaluation, and Research. *Matern Child Health J.* 2023;1-18.
2. Rising SS. Centering pregnancy. An interdisciplinary model of empowerment. *J Nurse Midwifery.* 1998;43(1):46-54.
3. Rising SS, Quimby CH. *The CenteringPregnancy model: the power of group health care:* Springer Publishing Company; 2016.
4. Massey Z, Rising SS, Ickovics J. CenteringPregnancy group prenatal care: promoting relationship-centered care. *Journal of Obstetric, Gynecologic & Neonatal Nursing.* 2006;35(2):286-94.
5. Ghani RMA. Effect of group centering pregnancy on empowering women with gestational hypertension. Hypothesis. 2018;55.
6. El Sayed HA, Abd-Elhakam EM. Effect of Centering Pregnancy Model Implementation on Prenatal Health Behaviors and Pregnancy Related Empowerment. *American Journal of Nursing.* 2018;7(6):314-24.
7. Sadiku F, Bucinca H, Talrich F, Molliqaj V, Selmani E, McCourt C, et al. Maternal Satisfaction with Group Care: A Systematic Review. *AJOG Global Reports.* 2023:100301.
8. Manant A, Dodgson JE. CenteringPregnancy: An Integrative Literature Review. *Journal of Midwifery & Women's Health.* 2011;56(2):94-102.
9. Lazar J, Boned-Rico L, Olander EK, McCourt C. A systematic review of providers' experiences of facilitating group antenatal care. *Reproductive Health.* 2021;18(1):1-21.
10. Catling CJ, Medley N, Foureur M, Ryan C, Leap N, Teate A, et al. Group versus conventional antenatal care for women. *Cochrane Database of Systematic Reviews.* 2015(2).
11. Byerley BM, Haas DM. A systematic overview of the literature regarding group prenatal care for high-risk pregnant women. *BMC Pregnancy and Childbirth.* 2017;17(1).
12. Liu Y, Wang Y, Wu Y, Chen X, Bai J. Effectiveness of the CenteringPregnancy program on maternal and birth outcomes: a systematic review and meta-analysis. *International Journal of Nursing Studies.* 2021;120:103981.
13. Rijnders M, Jans S, Aalhuizen I, Detmar S, Crone M. Women-centered care: Implementation of CenteringPregnancy® in The Netherlands. *Birth.* 2019;46(3):450-60.
14. Proctor E, Silmere H, Raghavan R, Hovmand P, Aarons G, Bunger A, et al. Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda. *Administration and Policy in Mental Health and Mental Health Services Research.* 2011;38(2):65-76.
15. Durlak JA, DuPre EP. Implementation Matters: A Review of Research on the Influence of Implementation on Program Outcomes and the Factors Affecting Implementation. *American Journal of Community Psychology.* 2008;41(3-4):327.
16. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *American journal of public health.* 1999;89(9):1322-7.
17. Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, et al. RE-AIM Planning and Evaluation Framework: Adapting to New Science and Practice With a 20-Year Review. *Frontiers in Public Health.* 2019;7.
18. Damschroder LJ, Reardon CM, Opra Widerquist MA, Lowery J. Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): the CFIR Outcomes Addendum. *Implementation Science.* 2022;17(1).
19. Novick G, Sadler LS, Knafl KA, Groce NE, Kennedy HP. In a hard spot: Providing group prenatal care in two urban clinics. *Midwifery.* 2013;29(6):690-7.

20. Novick G, Sadler LS, Kennedy HP, Cohen SS, Groce NE, Knafl KA. Women's Experience of Group Prenatal Care. *Qualitative Health Research*. 2011;21(1):97-116.
21. Bloomfield J, Rising SS. CenteringParenting: an innovative dyad model for group mother-infant care. *J Midwifery Womens Health*. 2013;58(6):683-9.
22. Damschroder LJ. Clarity out of chaos: use of theory in implementation research. *Psychiatry research*. 2020;283:112461.
23. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science*. 2022;17(1):1-16.
24. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *The Annals of Family Medicine*. 2014;12(6):573-6.
25. Sikka R, Morath JM, Leape L. The quadruple aim: care, health, cost and meaning in work. *BMJ Publishing Group Ltd*; 2015. p. 608-10.
26. Martens N, Crone MR, Hindori-Mohangoo A, Hindori M, Reis R, Hoxha IS, et al. Group Care in the first 1000 days: implementation and process evaluation of contextually adapted antenatal and postnatal group care targeting diverse vulnerable populations in high-, middle- and low-resource settings. *Implementation Science Communications*. 2022;3(1).
27. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*. 2015;42:533-44.
28. Hunter LJ, Da Motta G, McCourt C, Wiseman O, Rayment JL, Haora P, et al. Better together: A qualitative exploration of women's perceptions and experiences of group antenatal care. *Women Birth*. 2019;32(4):336-45.
29. Wiggins M, Sawtell M, Wiseman O, McCourt C, Greenberg L, Hunter R, et al. Testing the effectiveness of REACH Pregnancy Circles group antenatal care: protocol for a randomised controlled pilot trial. *Pilot and Feasibility Studies*. 2018;4(1).
30. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC medical research methodology*. 2013;13(1):1-8.
31. Perdok H, Jans S, Verhoeven C, Henneman L, Wiegers T, Mol BW, et al. Opinions of maternity care professionals and other stakeholders about integration of maternity care: a qualitative study in the Netherlands. *BMC pregnancy and childbirth*. 2016;16:1-12.
32. Hollander M, de Miranda E, Vandenbussche F, van Dillen J, Holten L. Addressing a need. *Holistic midwifery in the Netherlands: A qualitative analysis*. *Plos one*. 2019;14(7):e0220489.
33. R. Kenens, Batenburg R. *Cijfers uit de Nivel-registratie van verloskundigen*. Utrecht: Nederlands Instituut voor Onderzoek van de Gezondheidszorg; 2021.
34. Nederlandse Zorgautoriteit. Prestatie- en tariefbeschikking verloskunde TB/REG-24609-01 2024 [Available from: https://puc.overheid.nl/nza/doc/PUC_742853_22/1/?vergelijkId=PUC_714891_22&vergelijkVersie=2].
35. Wagijo M-a, Crone M, Bruinsma-van Zwicht B, van Lith J, Billings DL, Rijnders M. Contributions of CenteringPregnancy to women's health behaviours, health literacy, and health care use in the Netherlands. *Preventive Medicine Reports*. 2023;35:102244.
36. Wedin K, Molin J, Svalenius ELC. Group antenatal care: new pedagogic method for antenatal care—a pilot study. *Midwifery*. 2010;26(4):389-93.
37. Andersson E, Christensson K, Hildingsson I. Parents' experiences and perceptions of group-based antenatal care in four clinics in Sweden. *Midwifery*. 2012;28(4):502-8.
38. Hodgson ZG, Saxell L, Christians JK. An evaluation of Interprofessional group antenatal care: a prospective comparative study. *BMC Pregnancy and Childbirth*. 2017;17(1).



39. Ickovics JR, Kershaw TS, Westdahl C, Magriples U, Massey Z, Reynolds H, et al. Group Prenatal Care and Perinatal Outcomes. *Obstetrics & Gynecology*. 2007;110(2):330-9.
40. Cunningham SD, Lewis JB, Shebl FM, Boyd LM, Robinson MA, Grilo SA, et al. Group Prenatal Care Reduces Risk of Preterm Birth and Low Birth Weight: A Matched Cohort Study. *J Womens Health (Larchmt)*. 2019;28(1):17-22.
41. Wagijo MaR, Crone MR, van Zwicht BS, van Lith JM, Schindler Rising S, Rijnders ME. CenteringPregnancy in the Netherlands: who engages, who doesn't, and why. *Birth*. 2022;49(2):329-40.
42. Novick G, Womack JA, Sadler LS. Beyond Implementation: Sustaining Group Prenatal Care and Group Well-Child Care. *Journal of Midwifery & Women's Health*. 2020;65(4):512-9.
43. Pekkala J, Cross-Barnet C, Kirkegaard M, Silow-Carroll S, Courtot B, Hill I. Key Considerations for Implementing Group Prenatal Care: Lessons from 60 Practices. *Journal of Midwifery & Women's Health*. 2020;65(2):208-15.
44. Phillippi JC, Myers CR. Reasons Women in Appalachia Decline CenteringPregnancy Care. *Journal of Midwifery & Women's Health*. 2013;58(5):516-22.
45. Andrade-Romo Z, Heredia-Pi IB, Fuentes-Rivera E, Alcalde-Rabanal J, Cacho LBB, Jurkiewicz L, et al. Group prenatal care: effectiveness and challenges to implementation. *Revista de Saúde Pública*. 2019;53:85.
46. Martens N, Hindori-Mohangoo AD, Hindori MP, Damme AV, Beeckman K, Reis R, et al. Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis. *BMC Pregnancy and Childbirth*. 2023;23(1).
47. Novick G, Reid AE, Lewis J, Kershaw TS, Rising SS, Ickovics JR. Group prenatal care: model fidelity and outcomes. *American Journal of Obstetrics and Gynecology*. 2013;209(2):112.e1-e6.
48. Carroll C, Patterson M, Wood S, Booth A, Rick J, Balain S. A conceptual framework for implementation fidelity. *Implementation science*. 2007;2:1-9.
49. Sutcliffe K, Thomas J, Stokes G, Hinds K, Bangpan M. Intervention Component Analysis (ICA): a pragmatic approach for identifying the critical features of complex interventions. *Systematic Reviews*. 2015;4(1).
50. Pawson R, Tilley N. An introduction to scientific realist evaluation. *Evaluation for the 21st century: A handbook*. 1997;1997:405-18.



CHAPTER 6

General Discussion

The aim of this work was two-fold. Within this GC_1000 project, determinants of implementability in different countries were identified and we evaluated the implementation of context-sensitive GC. In this thesis, we first described the overall design of the GC-1000 project (Chapter 2). Seven different countries were included to capture diversity with regard to implementation challenges, health systems and cultural and economic factors, which enabled the development of a widely applicable implementation strategy toolbox. A consortium of various partner organisations was assembled and grouped into consecutive work packages based on their research and practical expertise. Context analyses were conducted, and their results informed adaptations and implementation strategies. Aiming to understand “what works for whom, under what circumstance and why”, the principles of realist evaluation, guided the process evaluation.

Findings of the context analysis in Suriname highlighted the complexities of reaching the GC target population (Chapter 3). Acceptability of GC and outer setting determinants were expected to shape women’s willingness to participate in GC. The comparison of findings from the context analyses in Suriname and in the Netherlands emphasises the predominant role of the outer setting: anticipated barriers were related to the health care system and to economic and cultural factors (Chapter 4). In Chapter 5 Gresh’s framework was applied to describe and evaluate the implementation of GC in two Dutch settings. Insights into implementation determinants, fidelity to the three core components of GC – structure, content and process - and women’s and facilitators’ experiences were provided.

In this final discussion chapter, we reflect on the findings of the contextual analyses in Suriname and in the Netherlands as well as the results of the process evaluation in the Netherlands. Subsequently, implementation strategies and their fit with the local context are discussed. The GC_1000 study design is revisited upon and implications of the results in this thesis are drawn.

DISCUSSION

Contextual determinants

Based on the context analysis in Suriname we concluded that multi-layered contextual factors are inherently intertwined and that they not only impact implementability and sustainability of GC, but also the reach of the target population (Chapter 3). Chapter 3 concludes that reach is the heart piece of sustained implementation of GC: consistent participation of (future) parents and an appropriate group size allow for community building and interactive learning

(i.e., implementability), and a sufficiently large number of recipients is needed to render GC cost-effective (i.e., sustainability).

Reach of target population

Based on our interviews and observations in Suriname, we argue that reach is contingent on acceptability of GC and outer setting factors, i.e., the wider context, including political, economic and cultural factors (Chapter 3). Outer setting factors that are directly linked to reach include competing demands of (future) parents due to economic stress, lacking infrastructure (e.g., long distances to health care facilities and childcare provisions during GC sessions), and disapproval from the social environment. A closer look at the sub-themes of acceptability reveals that they, too, are penetrated by outer setting factors, such as cultural norms and beliefs. For instance, high regard for privacy – especially around pregnancy and family constellations and dynamics – and misoneism, advice-seeking from older women instead of Health Care Professionals (HCPs), and the wide-spread notion that preventative care is unnecessary, influence the acceptability of GC amongst Surinamese pregnant women and their partners. Hence, the outer setting – especially economic and cultural factors - shapes reach directly and indirectly, through acceptability.

The predominant role of outer setting determinants

A comparison of the findings of pre-implementation context analyses in Suriname and the Netherlands leads to the conclusion that the most striking differences between both countries were related to the outer setting, and that they trickle down and affect other layers of context, namely the inner setting and individuals involved (Chapter 4). Disparities between the health care systems of both countries were linked to divergent expectations of what can be achieved with GC and to midwives' motivation to introduce GC at their respective settings. For instance, low health insurance coverage (in Suriname) and (un)availability of a reimbursement plan of midwifery practices for GC (in the Netherlands) determined who would carry the additional financial burden associated with GC: recipients (Suriname) or health care institutions (the Netherlands). Consequently, Surinamese midwives were concerned about the exclusion of mothers of lower Socio-Economic Status (SES), and Dutch midwives worried about feasibility from the perspective of the implementing organization. Moreover, the country's economic situation influences how governmental spending is allocated to preventative measures, such as GC, and under what conditions. For Surinamese policy makers the generation of local evidence for improved pregnancy outcomes (namely survival rates) and cost-effectiveness were of great importance as resources were sparse. Moreover,



unavailability of postnatal care provision was linked to prioritising partner involvement in Suriname over open conversations. As many women do not receive Postnatal Care (PNC) in Suriname, HCPs pointed out that it was important to involve their partners in GC, seizing the opportunity to prepare them for their care responsibilities postpartum. In the Netherlands, where postnatal care is well organized and hence the role of men in postnatal care is less vital, midwives prioritise open conversation at the expense of partner inclusion.

When implementing GC, a number of important determinants are not (directly) linked to the outer setting (Chapter 3, 4 and 5). Important inner setting determinants include logistical challenges (e.g., finding a (large/private) room and staff capacity. With regard to characteristics of the innovation, the relative advantage of GC compared with standard care (increased health knowledge, social support, preparedness for parenthood) is a driving force for midwives' motivation to offer GC. Midwives' motivation is also linked to self-efficacy, which tends to solidify after completion of the GC training and with experience over time.

Process evaluation

At the two Dutch settings examined in Chapter 5, GC was implemented with high fidelity. Yet, room for improvement regarding recruitment/group size, time management and facilitation style was identified. Midwives and women were overall satisfied with GC but challenges such as increased workload and poor group cohesion were also mentioned by midwives and women respectively. Our findings indicate that poor group cohesion and lower levels of interaction can be found in small groups. Indeed, group size, which is determined by reach/recruitment, was a bottleneck for successful implementation of GC at these two settings. In addition to its impact on women's interaction and cohesion, group size also affected time management and costs, although in distinct manners: a larger group was beneficial for cost-effectiveness, yet it hampered time management during health checks; and vice versa in small groups midwives experience less challenges related to time management but cost-effective was compromised. Furthermore, we found that language incompatibility hampered community building. Diversity amongst participants was challenging, not only with regard to language and culture but also in terms of educational backgrounds. Tailoring discussion content to divergent educational levels appeared to be challenging.

Adaptations and implementation strategies

In GC_1000 we sought to develop context-sensitive forms of GC and to apply implementation strategies that foster successful implementation and up-take.

As described in Chapter 2, one work package was dedicated to the development of adaptations and implementation strategies based on findings from contextual analyses. Below, we reflect on implementation strategies and adaptations that were developed and applied in Suriname and the Netherlands, and on their fit with the respective local context.

Implementation strategies

The two Dutch settings discussed in Chapter 5 participated in several implementation strategies that were developed on the basis of the RQI findings (Chapter 3 and 4) to improve intervention-context fit and to augment adoption, implementation, sustainment, and scale-up of GC [1]. As was the case at all GC_1000 implementation sites, the Dutch midwives followed a GC training, and they received on-going support and guidance from a Group Care Global (GCG) consultant. Additionally, the Dutch midwives held regular feedback sessions organized by the municipality, and they followed a recruitment training in the hope to increase reach. Aiming to overcome recruitment challenges, one setting sought to accommodate for women's work obligations by scheduling GC sessions in the evening. Furthermore, one setting - where recruitment was less problematic - opted to start with the inclusion of Dutch-speaking women only. Members of *Stichting Centering* who were also involved in the GC_1000 project were successful in their efforts to lobby for a GC reimbursement plan at national level.

Next to the GC training and guidance from a GCG consultant, strategies that facilitated the implementation of antenatal GC in Suriname included flexibility for scheduling of GC sessions and the involvement of a GC champion by one of the midwives to ensure buy-in and support from the management and other colleagues [2]. Health care assessments of pregnant women were conducted in a separate room as the GC room did not offer sufficient space and privacy. Fathers were involved in antenatal and postnatal GC sessions and the Surinamese implementation site where postnatal GC was successfully implemented planned to continue postnatal GC until the babies are two years of age (work package 3 and 5, see Chapter 2). The process evaluation at the Antenatal Care (ANC) facilities in Suriname concluded that a continuous GC format for ANC and PNC ought to be developed.² This proposition of a continuous GC model, but also the majority of barriers and facilitators reported in the process evaluation overlap with findings from the context analysis in Suriname (Chapter 3). For instance, limited staff capacity, increased workload and unsustainable funding were identified as potential obstacles during the context analysis prior to the re-introduction of GC [3], and indeed lack of financial compensation for midwives who received additional tasks



associated with GC hindered the implementation of GC at the three Surinamese antenatal care settings, where GC was not restarted after COVID-19 [2]. Further anticipated implementation determinants identified during the context analysis in Suriname, such as concerns regarding privacy/confidentiality and low acceptability due to multi-partnering [3], were mentioned as anticipated barriers at settings where antenatal GC was not re-introduced [2]. The evaluation study that explored why three out of four antenatal care settings that had to stop GC after the first few sessions because of the COVID-19 pandemic, did not re-introduce GC, shows that several anticipated barriers found in the context analysis (Chapter 3), such as concerns regarding funding and privacy, did indeed hinder the implementation of GC [2]. This suggests that effective strategies to overcome these anticipated barriers were not, or could not be developed. Similarly, in the Netherlands concerns regarding time-management and provision of stimulating content for women of diverse educational and cultural backgrounds raised by Dutch midwives during the context analysis prior to the implementation of GC were not addressed during the implementation phase, and hence these concerns manifested as actual implementation barriers.

As aforementioned, some implementation strategies were reported in Suriname and the Netherlands but they were just partly tailored to the respective contexts. For instance, a major implementation strategy in both countries was the GC training provided by GCG that all GC_1000 facilitators followed. Contextual analyses prior to the implementation shed light on potential barriers and these insights were less used to integrate more context-sensitive GC content to the trainings for each country. Previous research however shows promising results for professional trainings that were tailored to the context: British general practitioners positively evaluated an adapted communication skill training, where on-site simulation patients at the clinical setting replaced hotel-based role plays [4], and an action research project in the Netherlands yielded a tailored interactive outreach training for nurses learning about evidence based practice [5]. Furthermore, a needs assessment inspired tailored trainings on behavioural management principles targeted at community mental health staff serving children with autism spectrum disorder, which proved successful [6]. Similarly, in the GC training Surinamese midwives were trained to include partners/fathers in the GC sessions but less attention was paid to preparing midwives for handling privacy concerns and issues around multi-partnering which according to the situational analysis was important to increase acceptability amongst potential clients and their families. In the Netherlands, a context-sensitive training could also have helped Dutch midwives in tailoring the discussion content to the needs of diverse

groups in terms of language and education. Surinamese midwives, on the other hand, could have been advised how to incorporate cultural practices, such as eating pimba and vaginal steam baths, into GC discussions. In the Netherlands, the midwives' changing role identity could have been addressed more during the GC training as underlying unease about their changing professional role identity and fear of compromised HCP-patient relationships appeared to feed challenges related to the brief health assessments in GC. Conducting these brief health assessments is part of the training, but a broader discussion about what it means to their work and relationship with the women might have better prepared them for this changing role, as professional role and identity form an important domain in behaviour change and implementation research [7,8].

Next to outer-context barriers and the potential of more context-sensitive GC trainings, contextual barriers that impact reach could have been the target of further implementation strategies. The context analysis in Suriname concluded that pregnant women in Suriname usually seek advice from older women in their surroundings and that preventive care is largely not valued by the target population. Consequently, alarm signals remain unrecognised and conditions untreated. Based on this contextual information, both for individual and group care, implementation strategies that target older women could have increased the reach of pregnant women for antenatal care: for GC, older women from the local community could for example have taken on the role of co-facilitator and receive a training on alarm signals during pregnancy, aiming for medically sound advice, or serve as GC champions. Evidence demonstrates that influential community members in Africa have been essential in HIV prevention efforts through advocacy, education, cultural mediation, and policy influence [9,10]. Their involvement not only led to more effective and culturally appropriate responses to the HIV/AIDS epidemic, but it also shows the effectiveness of implementation strategies targeted at local opinion leaders [9,10].

Concluding, despite important advances in the implementation of GC (such as the approved reimbursement plan GC in the Netherlands), context-sensitive implementation strategies to overcome some anticipated obstacles were less often adopted, but rather the standard GC implementation strategies – training and guidance – were applied for the implementation of antenatal GC. Some implementation strategies were developed once challenges arose, especially in the Netherlands and some of these implementation strategies did not come without expense for the Dutch settings. For instance, the recruitment of Dutch-speaking participants only, lead to partial exclusion of the GC_1000 target group: the



most “vulnerable” women frequently present with limited Dutch-language skills. Moreover, the recruitment training some Dutch midwives followed to increase up-take of GC did not cater sufficiently for their needs and preferences. Hence, the missed opportunity to develop context-sensitive implementation strategies in a timely manner led to on-the-go developed implementation strategies with compromised fit (with project objectives and HCP’s preferences) in the Netherlands, and to the manifestation of some anticipated barriers into actual implementation barriers in Suriname.

Context matters – and then?

Why were findings of the context analyses just partly used to develop measures that foster implementation success? Implementation scientists agree that context matters [11]. Nonetheless, the concept *context* remains blurry and when contextual determinants *are* identified in implementation studies, regrettably often little is done beyond this first step (i.e., beyond the context analysis) [12,13]. The lack of tailored implementation strategies in the Netherlands and Suriname confirms this critical remark. Context has been said to be the “black box” of implementation science and researchers point out the risk of recreating the research-to-practice gap in implementation science [12,14,15].

Determinant frameworks [16,17] and tools to guide the assessment of contextual determinants have been developed [12,18,19]. Frameworks that provide guidance for the adaptation of EBIs, such as the FRAME [20], have also been proposed. Yet, little guidance for the development and adaptation of implementation strategies is available. Hence, implementors have to embark on a creative endeavour for the development of idiosyncratic strategies, or they have to resort to established implementation strategies. 73 distinct implementation strategies have been mapped [21] but as little guidance for the selection of an appropriate implementation strategy is available (based on determinants identified), the selection can be daunting [1]. Kirchner and colleagues suggest that implementation frameworks such as the Promoting Action on Research Implementation in Health Services (i-PARISH) framework [22] and the CFIR [23] can help implementors select implementation strategies [1]. However, we argue that these frameworks offer limited guidance for the selection of implementation strategies as they do not link specific implementation strategies to specific contextual determinants. Looking through the lens of the CFIR addendum [17], the “black box” in implementation science lies between the antecedent assessment and the anticipated implementation outcomes: despite recent advances in the field [24-26], more guidance to select and to develop implementation strategies for specific determinants is needed [16].

Fernandez and colleagues emphasise that determinants should always be the starting point from which to pick or create implementation strategies, and they refer to *intervention mapping* for evidence-based guidance [27,28]. However, while behaviour change techniques at individual and organisational level are at the core of intervention and implementation mapping, matching implementation strategies and determinants from the outer setting, or the macro level (i.e., wider context), is less straight forward.

Determinants in the outer setting are somewhat neglected in implementation studies and implementation science could benefit from collaboration with other fields that have studied outer setting factors thoroughly, such as political science [11,29]. Reasons for overlooking the outer setting may include methodological challenges and its relative resistance to change in comparison with factors at the individual and organizational level [29,30]. By nature cultural, political and economic factors are not easily manipulated, especially not in the notoriously short life span of an implementation science project. Within GC_1000, a crucial outer setting barrier was overcome in the Netherlands: a reimbursement plan for GC was introduced at national level, rendering GC lucrative for midwifery practices. However, this pivotal step is the result of years of lobby work, dating back to 2011 when GC was first introduced in the Netherlands. In a bottom-up approach enthusiastic midwives, researchers, the midwifery organization and midwifery educators joined forces to implement, deliver evidence and influence policy makers using (social) media and participating in relevant maternity care networks and programs. Moreover, a non-governmental organisation, *Stichting Centering*, that purely focuses on the scale-up of GC was founded. Such efforts usually go beyond the scope of an implementation science project, which is why critical outer setting factors are not easily addressed. GC_1000 was to be completed after four years, yet the process of designing and implementing an EBI can take up to 30-40 years [31]. Hence, it would be sensible to extend the length of comparable implementation science projects, allowing for sufficient time to address contextual factors that are not easily influenced.

Collaboration between researchers and implementers in an implementation research project is often advised, if only because of the wealth of experience implementers bring to a project, and more effective scaling up of EBIs. However, such a consortium constellation may also become a potential pitfall of implementation science projects as it may hamper adaptation and implementation strategy development, which might also have been the case in The Netherlands and in Suriname. Although they share the aim of improving the implementation,



developers of the intervention and researchers often have distinct priorities: the implementation and scale up of the EBI vs. knowledge generation respectively. While researchers can be overly theoretical and at too far a distance from the clinical practice [15,32], pre-existing beliefs of what works of implementers may constrain openness to findings from research and to adaptation of the EBI or of the implementation strategies [12]. In this way, the idea that an EBI is rigid can be conveyed, as was the case at three Surinamese ANC settings [2].

Function and form

An EBI consists of form and function. The *form* of an EBI consists of peripheral elements and methods that can be amended until eventually a different form of the same EBI evolved [33,34]. The form compromises of the *how*, how EBIs are implemented. A new form of the same EBI, however, can only develop with adherence to the *function*. The function of an EBI is non-negotiable. It comprises of those essential elements necessary for the EBI to be effective [33,34].

In Chapter 5, Gresh's framework was applied to investigate adherence to the three GC core components, structure, content (i.e., health assessments and self-assessments) and process (i.e., interactive learning and community building) [35]. These core components combined are, according to this framework, the function of GC [33]. The process evaluation in Suriname reveals that some of Surinamese midwives perceived the GC model as rigid [2]. Adaptations to the model were not reported and group size, gestational age and frequency of sessions were described as implementation barriers [2].

A closer look at Gresh's model, helps understand why GC was perceived as rigid and why adaptations were sparsely developed. Structure, one of GC's core elements, has it that groups should consist of 6-8 family units who are present consistently to achieve group stability, that the same facilitator(s) should be present for every session, and that sessions should last between 90 and 120 minutes. Adherence to these sub-elements cannot always be achieved, as was the case at the two Dutch settings from Chapter 5. Overall, both Dutch midwifery clinics reported high levels of fidelity but adherence to the recommended structure elements regarding group size, stability and timing were more challenging. Strictly considering these structural elements as requirements without which fidelity and ultimately outcomes are compromised can be discouraging for implementers [2].

The *form* of GC is not described in Gresh's model. The model contains three core components but it does not include peripheral elements that can be amended.

However, Gresh and colleagues argue that the GC model they propose is adaptable; although without specifying which elements are flexible (to what extent), or how to adapt them. Moreover, during the GC training, trainers emphasise flexibility regarding discussion topics and interactive learning methods. Yet, little guidance is provided on how to determine which topics and interactive learning methods fit the local context. This flexibility is also not clearly reflected in the model description that focusses on the function of GC and less on the form. Uncertainty about the form of GC explains why adaptations to the form are just scarcely developed: it makes the GC model appear prescriptive, and implementers are expected to develop adaptations, while at the same time not knowing what to adapt (and how to adapt).

While a description of the “adaptable periphery” of GC is lacking, the function is described: structure, content and process are the core components of GC [35]. But how do we know that these core elements are in fact the active ingredients of GC? To the best of our knowledge this claim is not evidence-based and research that identifies and operationalises the core components, or active ingredients of GC and links them to specific outcomes has yet to be conducted [36,37].

In fact, in the Netherlands an online version of GC for Eritrean women has been developed in response to the covid-19 pandemic and later it was continued due to its accessibility. This format does not allow for health assessments, yet it resonates with the needs of the target population. This raises the question if the core component content (i.e., health assessments and self-assessments) truly is a non-negotiable active ingredient of GC. Furthermore, based on our process evaluation in the Netherlands and other studies, we know that GC works (i.e., high fidelity in terms of process and content and high satisfaction with care) with adaptations to the core component structure [38,39]. This suggests that at least some aspects of the structure are not core components but rather linked to the *form* of GC: it entails elements that can be adapted. For instance, as emphasised in Chapter 5, group size matters as it is linked to feasibility, interactiveness and cohesion of groups. Yet, in itself it is not essential for implementation success: smaller and larger groups have run successfully [40]. Thus, both structure and content do not seem to be active ingredients of GC, they are form rather than function.



The inevitable question whether the third core component, process (interactive learning and community building), is in fact an active ingredient of GC arises out of the doubts over the essentiality of the other two core components (i.e., structure and content). According to Gresh's model interactive learning has to take place in a group discussion and indeed interactive learning is inspired by constructivist theory and social interaction theory [41-43]. Accordingly, interactive learning consists of a "learning by doing" part, where new knowledge is not passively consumed but actively generated in a meaningful manner, and this construction of new insights is facilitated through social interactions [43]. Health prevention programs based on such interactive learning approaches have proven effective: increased health knowledge, self-efficacy and improved health behaviours have been reported [43-45]. However, other formats of interactive learning based on constructivist theory only, such as gamified, interactive educational programs for smart phones, or computers, that do not contain social elements are conceivable and have been introduced in health prevention in recent years. Evidence for the effectiveness of such interactive e-learning programs targeted at breastfeeding and at sexual health promotion is promising [46-47]. Hence, whether peer education (i.e. social interaction), or active involvement in the learning process (i.e. constructionism), or both are pivotal for the effectiveness of GC warrants further research; research that links these different *forms* of interactive learning to specific outcomes such as health knowledge, or health behaviours. Moreover, experimental studies that test if GC with interactive learning is indeed more effective than a control condition with a didactic form of GC have yet to be conducted. Hence, although the GC model has a strong theoretical foundation, such as adult learning theory⁴⁸ and experiential learning theory [49], empirically we cannot claim, yet, that interactive learning is indeed an active ingredient of GC. Thus, it seems that community building is the only active ingredient we can be certain of. Evidence supports not only the correlational but also the causal link between strong social networks, better health and reduced mortality [50]. However, community building as described in the GC mode needs a more detailed definition. Does GC really build communities, or is social support a more appropriate term?

While uncertainties regarding the distinction of function and form are not uncommon amongst complex interventions [51], they may partially explain the difficulties in the development of context-sensitive adaptations and implementation strategies.

Bridging research and practice

If the developers of an EBI, such as GCG and *Stichting Centering*, are part of an implementation science consortium, the project can benefit of their insights based on years of practical experience, but “blind spots” may also be introduced [12]. Therefore, it is of ample importance to ensure that both agendas, research and implementation, can thrive concurrently and interactively [15]. Within GC_1000 the developers and champions of GC were part of the consortium, which was beneficial for the scale-up of GC. This was also in line with the call that financed the project aiming to implement evidence-based interventions in low- and middle income countries. This however also meant that research goals were subordinate to the implementation goals.

The focus on implementation and the short, four-year, duration of the project also meant that there were time constraints for contextual analyses (see Chapter 4). The project therefore applied Rapid Qualitative Inquiry (RQI) methodology (see chapter 2), because it allows to gain insiders’ perspectives in a time-efficient manner, compensating for the short duration of the inquiry by iterative data collection and analysis by a team composed of outsiders, such as the PhD student, and insiders, such as local researchers [52]. However, due to travel restrictions imposed by the covid-19 pandemic, collaboration of local and external researchers was hampered. Navigating different time zones posed an additional challenge on the planning of data collection activities and on the communication, internally within the research team but also externally with participants. Interviews and focus groups were partially conducted online and frequently technical disturbances caused disruptions. In most countries it was not possible to hold daily debriefings attended by all researchers, which limited the exchange in the research teams and hampered the iterative process that is integral to RQI. Due to these covid-19 inflected obstacles and time constraints, it was extremely challenging to collect rich contextual data in seven countries. Hence, the development of deep structure adaptations [53] was hardly attainable in this project.

Reflections on study design and execution & implications for future projects

With hindsight, the project would have benefited from the application of not only a determinant framework, the CFIR, but also a process framework [16] and an adaptation framework, such as the FRAME [20]. For the process evaluation implementation outcomes should have been selected and operationalised [54], and hypotheses should have been formulated and tested, adhering to the principles of realist evaluation [55,56]. After all, in the field of implementation science, implementation strategies are the interventions being tested [1]. Furthermore, as



contexts are dynamic and prone to change, the collection of contextual data and the development of adaptations and implementation strategies should have been an on-going, iterative process throughout the entire duration of the project [33].

In response to some of the aforementioned drawbacks a promising tool has been proposed for future implementation science projects: Implementation mapping. Implementation mapping is a systematic and practical approach for the selection, development and evaluation of implementation strategies, containing of five steps: (1) needs assessments, (2) identification of adoption and implementation outcomes, performance objectives, determinants, and change objectives, (3) selecting theoretical methods and designing implementation strategies, (4) production of implementation protocols and materials, (5) evaluation of implementation outcomes[27]. In particular, step 2 provides guidance for the development of matrices that clarify *what* needs to change in order to attain specific outcomes, and step 3 offers theoretical background on *how* to achieve that change.

Precise operationalisations of outcomes, performance objects, change objectives, but also of the target group are crucial. For the purpose of GC_1000, de Groot and colleagues' definition of vulnerability [57] was adapted to: Vulnerability is a dynamic state that reflects converging effects of a set of interacting and amplifying personal, environmental and structural factors, where risk factors outweigh protective factors leading to enhanced susceptibility to adverse health outcomes in the first 1000 days and hampering recovery. As this definition is complex and broad, implementors did not interpretate it consistently: at some Dutch settings highly educated working mothers were perceived as vulnerable, while other GC_1000 settings linked vulnerability mainly to lower SES. Inclusion and exclusion criteria should have been agreed upon to foster consensus on the target population.

In the Netherlands, pregnant women with a refugee background are at greater risk of adverse pregnancy and health outcomes [58]. Social isolation and difficulties to navigate the Dutch health care and social systems have been reported [58]. Hence, GC can be particularly beneficial for women with a refugee background, and pilot projects in the Netherlands confirm that GC in asylum seeking centres and online groups for pregnant women from Eritrea offer social support and guidance [59-61]. Therefore, the implementation of GC for these specific "vulnerable" groups, might be of additive value, but they also are hampered by financial and political changes and decisions. Moreover, if GC focusses on such "vulnerable" groups, the risk of stigmatization is tangible. Health interventions targeting marginalized

groups may carry a stigma that can deter high SES individuals from participating. For instance, interventions for HIV prevention or mental health services are frequently associated with marginalized communities, leading to a perception that these services are not meant for high SES individuals [62,63]. Mandatory parenting classes for all expecting parents would not only mitigate the risk of stigmatization but they would also smoothen the transition into parenthood for all parents to be.

Distinct forms of GC should be developed proactively and iteratively throughout the implementation process for these specific “vulnerable” groups. Subsequently, the newly developed forms of GC can be tested using a hybrid effectiveness-implementation study design that would not only allow for testing of the effectiveness of an EBI in real-world settings but also for evaluation of implementation strategies [64,65]. With such study designs, the relationship between implementation outcomes and health outcomes can be investigated [15]. Yet, before different forms of GC can be studied, the groundwork needs to be laid: distinction of function and form. The investigation of GC core components using an appropriate research design, such as intervention component analysis, is highly recommended [66].



REFERENCES

1. Kirchner, J.E., Smith, J.L., Powell, B.J., Waltz, T.J. & Proctor, E.K. Getting a clinical innovation into practice: an introduction to implementation strategies. *Psychiatry research* **283**, 112467 (2020).
2. Veenstra-Kwakkel, S., *et al.* Enablers and barriers associated with successful implementation of group antenatal care in primary care facilities in Suriname: a qualitative evaluation study. *Discover Health Systems* **3**(2024).
3. Martens, N., *et al.* Anticipated benefits and challenges of implementing group care in Suriname's maternity and child care sector: a contextual analysis. *BMC Pregnancy and Childbirth* **23**(2023).
4. Rollnick, S., Kinnerley, P. & Butler, C. Context-bound communication skills training: development of a new method. *Medical education* **36**, 377-383 (2002).
5. Friesen-Storms, J.H., Moser, A., van der Loo, S., Beurskens, A.J. & Bours, G.J. Systematic implementation of evidence-based practice in a clinical nursing setting: A participatory action research project. *Journal of clinical nursing* **24**, 57-68 (2015).
6. Bryson, S.A. & Ostmeier, K.F. Increasing the Effectiveness of Community Mental Health Center Social Skills Groups for Children with Autism Spectrum Disorder: A Training and Consultation Example. *Administration and Policy in Mental Health and Mental Health Services Research* **41**, 808-821 (2014).
7. Cane, J., O'Connor, D. & Michie, S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science* **7**, 37 (2012).
8. Michie, S. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Quality and Safety in Health Care* **14**, 26-33 (2005).
9. Rapaport, S.F., *et al.* Implementing HIV prevention in Sub-Saharan Africa: A systematic review of interventions targeting systems, communities, and individuals. *AIDS and Behavior* **27**, 150-160 (2023).
10. Carm, E. Department of Education, Stockholm University (2017).
11. Nilsen, P. & Bernhardsson, S. Context matters in implementation science: a scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. *BMC health services research* **19**, 1-21 (2019).
12. Mielke, J., *et al.* Methodological approaches to study context in intervention implementation studies: an evidence gap map. *BMC Medical Research Methodology* **22**(2022).
13. Harvey, G., *et al.* Connecting the science and practice of implementation—applying the lens of context to inform study design in implementation research. *Frontiers in health services* **3**(2023).
14. Westerlund, A., Nilsen, P. & Sundberg, L. Implementation of implementation science knowledge: the research-practice gap paradox. *Worldviews on evidence-based nursing* **16**, 332 (2019).
15. Beidas, R.S., *et al.* Promises and pitfalls in implementation science from the perspective of US-based researchers: learning from a pre-mortem. *Implementation Science* **17**, 55 (2022).
16. Nilsen, P. Making sense of implementation theories, models, and frameworks. *Implementation Science* **3.0**, 53-79 (2020).
17. Damschroder, L.J. Clarity out of chaos: use of theory in implementation research. *Psychiatry research* **283**, 112461 (2020).
18. Mielke, J., *et al.* The Basel Approach for coNtextual ANALysis (BANANA) in Implementation Science Using the SMILe Project as an Example. *Presentation at: ESPACOMP* (2019).

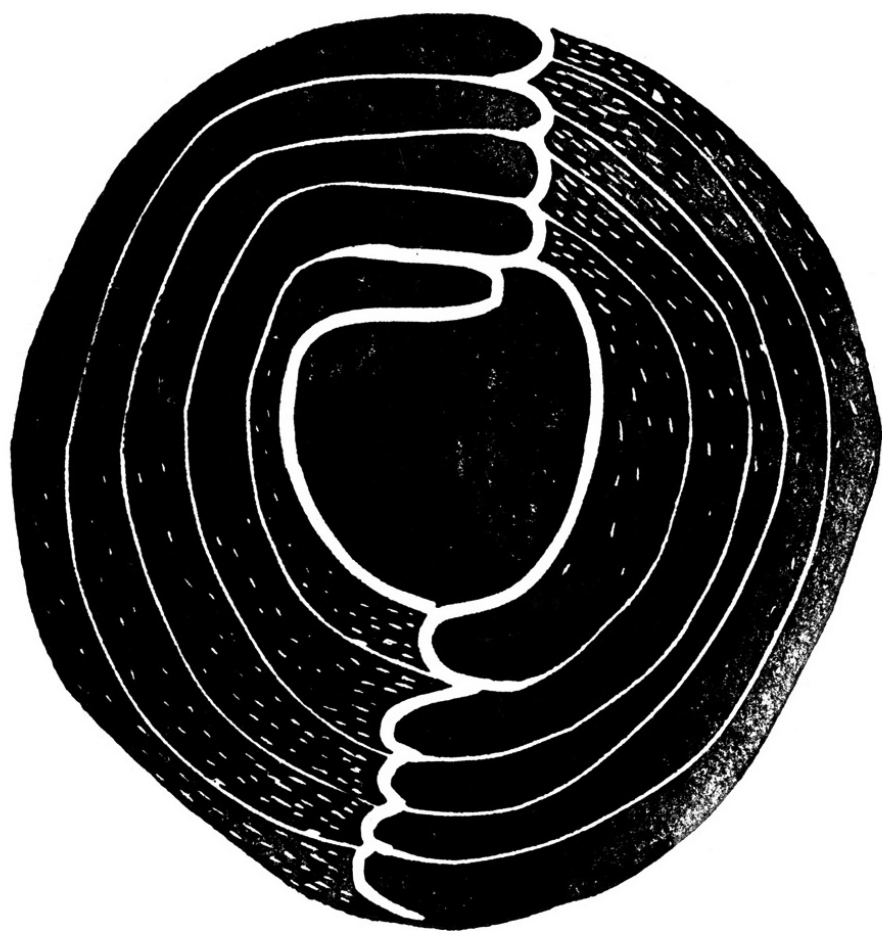
19. Brakema, E.A., *et al.* A systematic approach to context-mapping to prepare for health interventions: development and validation of the SETTING-tool in four countries. *BMJ Global Health* **6**, e003221 (2021).
20. Wiltsey Stirman, S., Baumann, A.A. & Miller, C.J. The FRAME: an expanded framework for reporting adaptations and modifications to evidence-based interventions. *Implementation Science* **14**, 1-10 (2019).
21. Waltz, T.J., *et al.* Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance: results from the Expert Recommendations for Implementing Change (ERIC) study. *Implementation Science* **10**(2015).
22. Harvey, G. & Kitson, A. PARIHS revisited: from heuristic to integrated framework for the successful implementation of knowledge into practice. *Implementation science* **11**, 1-13 (2015).
23. Damschroder, L.J., Reardon, C.M., Widerquist, M.A.O. & Lowery, J. The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science* **17**, 1-16 (2022).
24. Powell, B.J., *et al.* Methods to improve the selection and tailoring of implementation strategies. *The journal of behavioral health services & research* **44**, 177-194 (2017).
25. Proctor, E.K., Powell, B.J. & McMillen, J.C. Implementation strategies: recommendations for specifying and reporting. *Implementation science* **8**, 1-11 (2013).
26. Waltz, T.J., Powell, B.J., Fernández, M.E., Abadie, B. & Damschroder, L.J. Choosing implementation strategies to address contextual barriers: diversity in recommendations and future directions. *Implementation Science* **14**(2019).
27. Fernandez, M.E., *et al.* Implementation mapping: using intervention mapping to develop implementation strategies. *Frontiers in public health* **7**, 158 (2019).
28. Kok, G., *et al.* A taxonomy of behaviour change methods: an Intervention Mapping approach. *Health Psychology Review* **10**, 297-312 (2016).
29. McHugh, S., *et al.* Measures of outer setting constructs for implementation research: A systematic review and analysis of psychometric quality. *Implementation Research and Practice* **1**, 263348952094002 (2020).
30. Bruns, E.J., *et al.* The role of the outer setting in implementation: associations between state demographic, fiscal, and policy factors and use of evidence-based treatments in mental healthcare. *Implementation Science* **14**, 96 (2019).
31. Rotheram-Borus, M.J. Designing Evidence-Based Preventive Interventions That Reach More People, Faster, and with More Impact in Global Contexts. *Annual review of clinical psychology* **17**, 551-575 (2021).
32. Rapport, F., *et al.* Too much theory and not enough practice? The challenge of implementation science application in healthcare practice. *Journal of Evaluation in Clinical Practice* **28**, 991-1002 (2022).
33. Harms, L.S.E., *et al.* Context matters—the phased development of an adaptable food literacy intervention: Up for Cooking. *Health Promotion International* **38**(2023).
34. Perez Jolles, M., Lengnick-Hall, R. & Mittman, B.S. Core Functions and Forms of Complex Health Interventions: a Patient-Centered Medical Home Illustration. *Journal of General Internal Medicine* **34**, 1032-1038 (2019).
35. Gresh, A., *et al.* A Conceptual Framework for Group Well-Child Care: A Tool to Guide Implementation, Evaluation, and Research. *Matern Child Health J*, 1-18 (2023).
36. Novick, G., *et al.* Group prenatal care: model fidelity and outcomes. *American Journal of Obstetrics and Gynecology* **209**, 112.e111-112.e116 (2013).
37. Sadiku, F., *et al.* Maternal Satisfaction with Group Care: A Systematic Review. *AJOG Global Reports*, 100301 (2023).



38. Heredia-Pi, I.B., *et al.* The Mexican experience adapting CenteringPregnancy: lessons learned in a publicly funded health care system serving vulnerable women. *Journal of midwifery & women's health* **63**, 602-610 (2018).
39. Sharma, J., O'Connor, M. & Rima Jolivet, R. Group antenatal care models in low- and middle-income countries: a systematic evidence synthesis. *Reproductive Health* **15**(2018).
40. Rising, S.S. & Quimby, C.H. *The CenteringPregnancy model: the power of group health care*, (Springer Publishing Company, 2016).
41. Jonassen, D.H. & Rohrer-Murphy, L. Activity theory as a framework for designing constructivist learning environments. *Educational technology research and development* **47**, 61-79 (1999).
42. Vygotsky, L.S. Mind in society: The development of higher psychological processes. *Harvard UP* (1978).
43. Al- Natour, A., *et al.* Students' perceptions and experiences in a health promotion course using interactive learning. *Heliyon* **7**, e07192 (2021).
44. Lu, C.-H., *et al.* Community-based interventions in hypertensive patients: a comparison of three health education strategies. *BMC Public Health* **15**, 33 (2015).
45. Roberts, M., Lobo, R. & Sorenson, A. Evaluating the Sharing Stories youth theatre program: an interactive theatre and drama-based strategy for sexual health promotion among multicultural youth. *Health Promotion Journal of Australia* **28**, 30-36 (2017).
46. Bailey, J.V., *et al.* Interactive computer-based interventions for sexual health promotion. *Cochrane Database of Systematic Reviews* (2010).
47. Amin, S.M., Mahrous, E.S., Alrimawi, I. & Elbially, A.A. The effectiveness of an interactive digital-based educational program in improving breastfeeding knowledge, attitudes and self-efficacy among primiparous women in Egypt. *African Journal of Reproductive Health* **26**, 79-91 (2022).
48. Rushton, F.E., Byrne, W.W., Darden, P.M. & McLeigh, J. Enhancing child safety and well-being through pediatric group well-child care and home visitation: The Well Baby Plus Program. *Child Abuse & Neglect* **41**, 182-189 (2015).
49. DeLago, C., *et al.* Qualitative evaluation of individual and group well-child care. *Academic pediatrics* **18**, 516-524 (2018).
50. Howick, J., Kelly, P. & Kelly, M. Establishing a causal link between social relationships and health using the Bradford Hill guidelines. *SSM Popul Health*. 2019; 8: 100402. (2019).
51. Chambers, D.A. Advancing adaptation of evidence-based interventions through implementation science: progress and opportunities. *Frontiers in Health Services* **3**(2023).
52. Beebe, J. *Rapid qualitative inquiry: A field guide to team-based assessment*, (Rowman & Littlefield, 2014).
53. Resnicow, K., Baranowski, T., Ahluwalia, J.S. & Braithwaite, R.L. Cultural sensitivity in public health: defined and demystified. *Ethnicity & disease* **9**, 10-21 (1999).
54. Proctor, E., *et al.* Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda. *Administration and Policy in Mental Health and Mental Health Services Research* **38**, 65-76 (2011).
55. Salter, K.L. & Kothari, A. Using realist evaluation to open the black box of knowledge translation: a state-of-the-art review. *Implementation Science* **9**(2014).
56. Pawson, R. & Tilley, N. An introduction to scientific realist evaluation. *Evaluation for the 21st century: A handbook* **1997**, 405-418 (1997).
57. De Groot, N., Bonsel, G.J., Birnie, E. & Valentine, N.B. Towards a universal concept of vulnerability: Broadening the evidence from the elderly to perinatal health using a Delphi approach. *PLOS ONE* **14**, e0212633 (2019).

58. Verschuuren, A.E.H. Maternity care for refugees and asylum seekers in the Netherlands. (2024).
59. Linden, I., van Kesteren, N., de Jong, P. & Pannebakker, F. Centering Parenting: procesevaluatie van een cultuursensitieve variant voor moeders en kinderen tussen 0 en 4 jaar oud in een asielzoekerscentrum. *JGZ Tijdschrift voor jeugdgezondheidszorg* **52**, 94-99 (2020).
60. Verschuuren, A., *et al.* Community midwives' perspectives on perinatal care for asylum seekers and refugees in the Netherlands: A survey study. *Birth* **50**, 815-826 (2023).
61. Bedaux, A. & Selase, A.W. Applying behavioural science ideas: How a group model helps Dutch midwives to serve pregnant Eritrean women. *Early Childhood Matters* (2022).
62. Krishnaratne, S., *et al.* Stigma and Judgment Toward People Living with HIV and Key Population Groups Among Three Cadres of Health Workers in South Africa and Zambia: Analysis of Data from the HPTN 071 (PopART) Trial. *AIDS Patient Care and STDs* **34**, 38-50 (2020).
63. Chimoriya, R., *et al.* Mental illness stigma and associated factors among Arabic-speaking refugee and migrant populations in Australia. *International Journal of Mental Health Systems* **17**(2023).
64. Curran, G.M., Bauer, M., Mittman, B., Pyne, J.M. & Stetler, C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Medical care* **50**, 217 (2012).
65. Kemp, C.G., Wagenaar, B.H. & Haroz, E.E. Expanding hybrid studies for implementation research: intervention, implementation strategy, and context. *Frontiers in Public Health* **7**, 325 (2019).
66. Sutcliffe, K., Thomas, J., Stokes, G., Hinds, K. & Bangpan, M. Intervention Component Analysis (ICA): a pragmatic approach for identifying the critical features of complex interventions. *Systematic Reviews* **4**(2015).
- 67.





APPENDICES

Samenvatting in het Nederlands

Curriculum Vitae

Acknowledgements

Summary

SAMENVATTING IN HET NEDERLANDS

Dit proefschrift is ingebed in het project Group Care during the first 1000 days (GC_1000) en heeft als doel een onderzoeksopzet voor te stellen voor de implementatie van prenatale en postnatale groepszorg in diverse landen, contextuele barrières en facilitators te identificeren en de implementatie van contextgevoelige GC te evalueren.

Hoofdstuk 1 schetst de relevantie van dit proefschrift. Wereldwijd blijven moedersterfte en morbiditeit onaanvaardbaar hoog. De gezondheid van moeder en kind wordt bepaald door een combinatie van proximale en distale factoren en zwangerschapsuitkomsten kunnen worden verbeterd door een hoogwaardige, mensgerichte benadering van perinatale zorg, zoals Group Care (GC). GC brengt acht tot twaalf vrouwen met een vergelijkbare zwangerschapsduur samen voor 90 minuten durende prenatale GC-sessies die risicobeoordeling (gezondheidszorg), educatie (interactief leren) en peer support (community building) combineren. Er is bewijs voor talrijke voordelen van GC gerapporteerd, waaronder een hogere tevredenheid met de zorg van servicegebruikers en zorgverleners, een toegenomen gebruik van prenatale zorgdiensten, verbeterde gezondheidsvaardigheden (over hoe problemen te voorkomen en herkennen) en gezondheidsgedrag, hogere borstvoedingspercentages, lager risico op maternale hypertensieve aandoeningen, verbeterde zwangerschapsuitkomsten en kosteneffectiviteit op de lange termijn. Echter, internationaal blijft traditionele een-op-eenzorg standaardzorg, waarschijnlijk vanwege uitdagingen tijdens de implementatie van GC.

In **Hoofdstuk 2** stellen we een onderzoeksontwerp voor voor de implementatie van GC in zeven verschillende landen, gericht op het vastleggen van diversiteit met betrekking tot implementatie-uitdagingen, gezondheidssystemen en culturele en economische factoren, wat uiteindelijk de ontwikkeling van een breed toepasbare implementatiestrategie tool box mogelijk zal maken. Voorafgaand aan de implementatie van GC werden Rapid Qualitative Inquiries (RQI) uitgevoerd in alle zeven landen met als doel contextuele determinanten te identificeren die de ontwikkeling van op maat gemaakte aanpassingen en implementatiestrategieën informeren.

In **Hoofdstuk 3** rapporteren we de bevindingen van de contextanalyse in Suriname, geleid door het Consolidated Framework for Implementation Research, en vervolgens vergelijken we contextuele factoren uit Suriname en Nederland in **Hoofdstuk 4**. Op basis van interviews en observaties in Suriname betogen we dat bereik afhankelijk is van de aanvaardbaarheid van GC en outer setting factoren, d.w.z. de bredere context, inclusief politieke, economische en culturele factoren. Outer

setting factoren die direct gekoppeld zijn aan bereik omvatten concurrerende eisen van ontvangers vanwege economische stress, gebrek aan infrastructuur (bijv. grote afstanden tot gezondheidszorgfaciliteiten en kinderopvangvoorzieningen tijdens GC-sessies) en afkeuring door de sociale omgeving. Een nadere blik op de subthema's van aanvaardbaarheid onthult dat ook deze worden doordrongen door outer setting factoren, zoals culturele normen en overtuigingen. Bijvoorbeeld, hoge achting voor privacy, misoneïsme, advies vragen aan oudere vrouwen in plaats van HCP's, en het wijdverbreide idee dat preventieve zorg onnodig is, beïnvloeden de aanvaardbaarheid van GC onder Surinaamse zwangere vrouwen en hun partners. Vandaar dat de outer setting – met name economische en culturele factoren – direct en indirect invloed hebben, via aanvaardbaarheid. Bij het vergelijken van de bevindingen van de RQI's in Nederland en Suriname, waren de meest opvallende verschillen ook gerelateerd aan de outer setting, en ze druppelen door en beïnvloeden andere lagen van de context, namelijk de interne setting en de betrokken personen. Zo werden verschillen tussen de gezondheidszorgsystemen van beide landen gekoppeld aan uiteenlopende verwachtingen van wat er met GC kan worden bereikt en aan de motivatie van verloskundigen om GC in hun respectievelijke praktijken te introduceren. Bovendien bepaalden een lage dekking van zorgverzekering (in Suriname) en de (on)beschikbaarheid van een vergoedingsplan voor GC (in Nederland) wie de extra financiële last zou dragen die gepaard ging met GC: ontvangers (Suriname) of zorginstellingen (Nederland). Bijgevolg maakten Surinaamse verloskundigen zich zorgen over de uitsluiting van moeders met een lagere SES (sociaal-economische status), en Nederlandse verloskundigen maakten zich zorgen over de haalbaarheid vanuit het perspectief van de uitvoerende organisatie. De economische situatie van het land beïnvloedt hoe overheidsuitgaven worden toegewezen aan preventieve maatregelen, zoals GC, en onder welke voorwaarden. Voor Surinaamse beleidsmakers was het genereren van lokaal bewijs voor verbeterde zwangerschapsuitkomsten (met name overlevingspercentages) en kosteneffectiviteit van groot belang, aangezien de middelen schaars waren. Bovendien werd het niet beschikbaar zijn van postnatale zorg gekoppeld aan het prioriteren van partnerbetrokkenheid in Suriname boven open gesprekken. Omdat veel vrouwen geen PNC ontvangen in Suriname, wezen zorgverleners erop dat het belangrijk was om hun partners te betrekken bij GC, en de kans te grijpen om hen voor te bereiden op hun zorgverantwoordelijkheden na de bevalling, ook al waren de zorgverleners zich ervan bewust dat de aanwezigheid van mannen de bereidheid van vrouwen om bepaalde kwesties te bespreken tijdens de zwangerschap zou kunnen beïnvloeden. In Nederland, waar postnatale zorg uitzonderlijk goed georganiseerd is en de rol van mannen in postnatale zorg dus minder belangrijk is, geven verloskundigen prioriteit aan open conversatie ten koste van partnerbetrokkenheid.



In **Hoofdstuk 5** werd Gresh's raamwerk toegepast om de implementatie van GC in twee Nederlandse verloskundepraktijken te beschrijven en evalueren. Inzichten in implementatiebepalende factoren, trouw aan de drie kerncomponenten van GC - structuur, inhoud en proces - en ervaringen van vrouwen en begeleiders worden geboden. In beide praktijken werd GC met hoge trouw geïmplementeerd. Toch werd er ruimte voor verbetering geïdentificeerd met betrekking tot rekrutering/groepsgrootte, tijdmanagement en begeleidingsstijl.

Hoofdstuk 6 bevat de algemene discussie van dit proefschrift. Implementatiestrategieën en -aanpassingen en hun aansluiting bij de lokale context worden besproken. Het GC_1000-studieontwerp wordt besproken - inclusief de relatie en mogelijke spanningen tussen onderzoeksagenda en praktische belangen in een implementatiewetenschappelijk consortium/project - en implicaties van dit werk worden getrokken.



CURRICULUM VITAE

Nele Martens was born in Ratzeburg, Germany on 2nd of February 1990. After obtaining the bachelor of Psychology from the University of Malta (2017), Nele enrolled for the master program Developmental and Health Psychology at the University of Amsterdam.

During her studies Nele worked as a research assistant and she conducted experimental alcohol research with a focus on implicit cognitive-motivational processes. In 2019, Nele obtained her masters degree. After a few months of employment at the online mental health provider Therapieland, Nele began her PhD-trajectory in January 2020. Nele's PhD was embedded in the project Group Care 1000 and she investigated the implementation of context-sensitive group care.

Next to her PhD-trajectory Nele followed courses in clinical psychology at the Open University and a training in cognitive behavioural therapy, which prepared her for her role as a researcher and psychologist at the Centrum Dubbele Problematiek from the Parnassia Group.



ACKNOWLEDGEMENTS

Yes, the thesis is written and accepted! I am grateful for the support throughout the years and I would like to thank some of my companions on this journey.

My “promotieteam” first. Ria, over the years you have not only become more involved in my trajectory but you have also become a mentor and cheerleader on my side. Your support in this last phase was indispensable and gave me the last push over the finishing line – thank you! Rianna, you knew best how to put me to work when I got lost in the literature and in doubt. Thanks for steering me back on track! Matty, you and Rianne kept reminding me of the vast grey space that lies between black and white. This sparked discussion and discussion is always useful when one is open to learning. In the future, I will remember you both and that nuances are to be found in the vast grey area. Matty, the past years you showed not only an interest in my growth as a researcher but you also truly cared about my personal and professional well-being. Thank you for your genuine interest and for the freedom and support you gave me to also grow as a psychologist. Next to all that, we also went on quite a few trips together and I cherish the memories of the fun we had! Dancing with Matty in Pristina and Paramaribo, jokes that go wrong in Cape Town and deep conversation on long bus rides in Belgium with Ria, playing “sugar mummy” for Rianne in Suriname.

I would like to thank all participants who enabled this research. The GC_1000 consortium were my closest colleagues, and I would like to thank especially some of you without whom this journey would not have been the same: Astrid and Florence, so many memories from Ghana to Kalken. Manodj and Ashna thank you not only for the collaboration on the articles but also for the warm welcome in Suriname. The TNO ladies – Marlies, Eline and Yvonne – for everything you organised and for your support navigating complicated situations.

Outside the project, I also received support from different corners of the world. In another lifetime we spent most of our time playing in tropical waters and despite all changes our friendships persist and supported me from close By and from afar: Mario, Polly, Isi, Dita, Han, Syb. I am forever grateful for my old-school friends from Kiel: Nora, Lea, Laura, Martyna, Inga, Pia and Katja. Katja, thank you for the beautiful illustrations that you let me use. They will make this thesis an eye-catcher. Anika, any adventure with you is like being in a movie.

Over the years, my roots in Netherlands have deepened and they have been an anchor on this journey. Thank you to Lana and all the TBS-crew. It is special to

have you on my side – on and off the mat. Nour, you let me complain about my PhD when life gave you lemons. Carlijn, you opened your arms when I needed it and this allowed beautiful friendships to grow. Sitting in Condé with a good glass of wine and surrounded by friends made writing so much better. Barbara and Jeff, I love having you in my life. Thanks for always encouraging me. Elianne, Dora and Tamas – thanks for open ears and swinging hips! Nacho and Joep, what can I say: it was love at first sight! When living abroad and when one is lucky, friends become more like family and provide support when moving house, going through break-ups, working on a PhD, or buying a car (who knew it could be so tricky!). I am blessed with these kind of friendships and I am very grateful for you! From the LUMC I would like to thank Moniek, Aart and the rest of medical psychology team for taking me under their wings, and Fia, Nienke and all the health campus team for the gezelligheid (on those rather rare occasions that I actually made it to Den Haag). I enjoyed guiding the master students who helped out on the project, and Tessa's contribution to our article was indispensable. Thank you!

Last but not least, thank you dear family! Opa, Karsten, Ma and Pa, thank you for being there, no matter if dive instructor or PhD-candidate. Tjark and Lisa, you are family and friends and my 'klankbord' for all the big questions that life throws at us. Well, this nasty one about finishing the PhD we dealt with: off to new adventures and new questions!



SUMMARY

This thesis is embedded in the Group Care during the first 1000 days (GC_1000) project and it aims to propose a study design for the implementation of antenatal and postnatal group care in diverse countries, to identify contextual barriers and facilitators and to evaluate the implementation of context-sensitive GC.

Chapter 1 outlines the relevance of this thesis. Globally maternal mortality and morbidity remain unacceptably high. Maternal and infant health are determined by a combination of proximal and distal factors and pregnancy outcomes could be improved through a high-quality, human-centred approach to perinatal care, such as Group Care (GC). GC brings eight to twelve women of similar gestational age together for 90-minute antenatal GC sessions that combine risk assessment (health care), education (interactive learning) and peer support (community building). Evidence for numerous benefits of GC has been reported, including higher satisfaction with care of service users and service providers, increased uptake of antenatal care services, improved health literacy (on how to prevent and recognize problems) and health behaviours, higher breastfeeding rates, lower risk of maternal hypertensive disorders, improved pregnancy outcomes, and long-term cost-effectiveness. However, internationally traditional one-on-one care remains standard care, likely due challenges during the implementation of GC.

In **Chapter 2** we propose a study design for the implementation of GC in seven differs countries, aiming to capture diversity with regard to implementation challenges, health systems and cultural and economic factors, which will ultimately enable the development of a widely applicable implementation strategy toolbox. Prior to the implementation of GC Rapid Qualitative Inquiries (RQI) were conducted in all seven countries with the aim to identify contextual determinants that inform the development of tailored adaptations and implementation strategies.

In **Chapter 3** we report the findings of the context analysis in Suriname guided by the Consolidated Framework for Implementation Research and we subsequently compare contextual factors form Suriname and the Netherlands in **Chapter 4**. Based on interviews and observations in Suriname we argue that reach is contingent on acceptability of GC and outer setting factors, i.e. the wider context, including political, economic and cultural factors. Outer setting factors that are directly linked to reach include competing demands of recipients due to economic stress, lacking infrastructure (e.g., long distances to health care facilities and child care provisions during GC sessions), and disapproval from the social environment. A closer look at the sub-themes of acceptability reveals that

they, too, are penetrated by outer setting factors, such as cultural norms and beliefs. For instance, high regard for privacy, misoneism, advice-seeking from older women instead of HCPs, and the wide-spread notion that preventative care is unnecessary, influence the acceptability of GC amongst Surinamese pregnant women and their partners. Hence, the outer setting – especially economic and cultural factors - shapes reach directly and indirectly, through acceptability. When comparing finding of the RQIs in the Netherlands and in Suriname, the most striking differences were also related to the outer setting, and they trickle down and affect other layers of context, namely the inner setting and individuals involved. For instance, disparities between the health care systems of both countries were linked to divergent expectations of what can be achieved with GC and to midwives' motivation to introduce GC at their respective settings. Moreover, low health insurance coverage (in Suriname) and (un)availability of a reimbursement plan for GC (in the Netherlands) determined who would carry the additional financial burden associated with GC: recipients (Suriname) or health care institutions (the Netherlands). Consequently, Surinamese midwives were concerned about the exclusion of mothers of lower SES (socio-economic status), and Dutch midwives worried about feasibility from the perspective of the implementing organization. The country's economic situation influences how governmental spending is allocated to preventative measures, such as GC, and under what conditions. For Surinamese policy makers the generation of local evidence for improved pregnancy outcomes (namely survival rates) and cost-effectiveness were of great importance as resources were sparse. Moreover, unavailability of postnatal care provision was linked to prioritising partner involvement in Suriname over open conversations. As many women do not receive PNC in Suriname, HCPs pointed out that it was important to involve their partners in GC, seizing the opportunity to prepare them for their care responsibilities postpartum, even though the HCPs were aware that the presence of men might affect women's willingness to discuss certain issues during the sessions. In the Netherlands, where postnatal care is exceptionally well organized and hence the role of men in postnatal care is less vital, midwives prioritise open conversation at the expense of partner inclusion.

In **Chapter 5** Gresh's framework was applied to describe and evaluate the implementation of GC in two Dutch settings. Insights into implementation determinants, fidelity to the three core components of GC – structure, content and process - and women's and facilitators' experiences are provided. At both settings, GC was implemented with high fidelity. Yet, room for improvement regarding recruitment/group size, time management and facilitation style were identified.



Chapter 6 contains the general discussion of this thesis. implementation strategies and adaptations and their fit with the local context are discussed. The GC_1000 study design is reflected upon – including the relationship and potential tensions between research agenda and practical interests in an implementation science consortium/project - and implications of this work are drawn.



