Fear and PTSD in obstetrics

Improving care for pregnant women and their healthcare providers

Baas, M.A.M.

Publication date
2024

Document Version
Final published version

Fear and PTSD in obstetrics

improving care for pregnant women and their healthcare providers

Melanie Baas

Fear and PTSD in obstetrics

Improving care for pregnant women
and their healthcare providers

Melanie Baas

Cover: the painting ‘Hope II’ by Gustav Klimt depicts a pregnant woman with closed eyes, bowing her head as if she is praying for the safety of her unborn child. Beneath her, three other females also lower their heads and raise their hands, presumably in prayer or mourning. The painting includes a human skull beside the pregnant woman’s belly, possibly symbolizing the dangers of childbirth or serving as a memento mori.

Financial contributions
The OptiMUM-study (chapters 4, 5, 6 and 7) was supported by grants from the Stichting EMDR Nederland (Dutch EMDR Association), Fonds Gezond Geboren, Stichting Teaching Hospital OLVG and Stichting Wetenschap OLVG, all awarded to the principal investigator M.G. van Pampus.

Financial support for the printing of this thesis was kindly provided by: ACTA, Stichting Wetenschap OLVG, vakgroep gynaecologie OLVG, Werkgroep Psychosomatische Obstetrie en Gynaecologie (WPOG), stichting Frederik Ruysch (www.frederik-ruijsch.nl) en de Hellp Stichting.

Cover design:	Wiebke Keck (Ridderprint)
Layout and design:	Melanie Baas and Wiebke Keck (persoonlijkproefschrift.nl)
Photo back cover:	Manja Herrebrugh, (AVZ/OLVG)
Printing:	Ridderprint, www.ridderprint.nl
ISBN:	978-94-6483-949-4

Fear and PTSD in obstetrics

Improving care for pregnant women and their healthcare providers

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. ir.P.P.C.C. Verbeek

ten overstaan van een door het College voor Promoties ingestelde commissie,

in het openbaar te verdedigen in de Aula der Universiteit

op woensdag 5 juni 2024, te 11.00 uur

door Melanie Anne Maria Baas

geboren te Mijdrecht

Promotiecommissie

Promotor:	prof. dr. A. de Jongh	Universiteit van Amsterdam
Copromotores:	dr. M.G. van Pampus	OLVG
	dr. C.A.I. Stramrood	Beval Beter
Overige leden:	prof. dr. J.A.M. van der Post	Universiteit van Amsterdam
	prof. dr. J. de Jonge	Vrije Universiteit Amsterdam
	prof. dr. B.F.P. Broekman	Vrije Universiteit Amsterdam
	dr. M.H. Hollander	Radboud Universiteit
	prof. dr. L. Dubois	Universiteit van Amsterdam
	prof. dr. F. Scheele	Vrije Universiteit Amsterdam

Faculteit der Tandheelkunde

CONTENTS

CHAPTER 1

General introduction

The core theme of this thesis is fear and trauma in obstetrics. This chapter aims to provide relevant background information and context for the remainder of this thesis. First, the relevance of the mother's mental health during pregnancy (Section 1.1.1) is described, followed by a summary of the prevalence, aetiology and previous intervention studies regarding Fear of Childbirth (FoC) in pregnant women (Section 1.1.2) and post-traumatic stress disorder (PTSD) after previous childbirth (Section 1.1.3). Furthermore, the importance of the impact of work-related traumatic events on Dutch gynaecologists is discussed (Section 1.2). Finally, the objectives of the research projects underlying this thesis are presented (section 1.3).

1.1.1 Maternal mental health during pregnancy

Although pregnancy and childbirth are often associated with feelings of joy and happiness, these experiences are accompanied by psychological distress for some women. The importance of maternal mental health during pregnancy is often overlooked in comparison to somatic foetal and maternal disorders; however it is a critical aspect of foetal and maternal well-being. Previous research has shown that approximately 25% of pregnant women suffer from mental health problems[1]. Psychological distress and anxiety during pregnancy may result in adverse psychological and obstetric outcomes for mothers and children, such as preterm birth[2,3], low birth weight[4] and postpartum depression[5]. In addition, the long-term neurocognitive development of the foetus may be affected. Placental transfer of dysregulated maternal cortisol levels may cause intrauterine malprogramming of the fetal hypothalamic-pituitary-adrenal (HPA) axis, with possible lifetime consequences, such as cardiovascular and psychiatric disorders later in life[6,7]. Additionally, maternal mental health is responsible for almost a quarter of all direct pregnancy-related deaths of women up to one year postpartum[8]. Given the range of negative consequences of psychological distress during pregnancy, it is essential that women receive adequate mental support and treatment when necessary to ensure their well-being and that of their unborn child.

1.1.2 Fear of Childbirth (FoC)

FoC is a common problem among pregnant women, and is characterized by a pathological fear of giving birth[9,10]. FoC affects women with and without prior childbirth experiences. The average prevalence rate of FoC is 5-15%, but estimates vary widely between countries, definitions and assessment methods[11,12]. The most commonly used instrument is the Wijma Delivery Expectations Questionnaire (WDEQ-A) with a cut-off point of ≥ 85[12,13]. FoC is a complex phenomenon that encompasses various components, including fear of the baby dying or being harmed, fear of harm to one's body and fear of loss of control during childbirth[13].

FoC can result in several problems, such as avoiding or ending pregnancy, requesting (and receiving) a planned caesarean section without medical indication[14,15], negative childbirth experience, and an elevated risk of PTSD following childbirth[10].

At the start of this research endeavour, a limited number of studies regarding treatment for FoC in pregnant women were available; that is, there were three randomized controlled trials (RCT's) had been published with in total 886 individuals suffering from this fear. These studies showed that in addition to cognitive therapy[16], group psycho-education with relaxation[17] [17,18]and telephone psychoeducation counselling by midwives[19] could effectively reduce levels of FoC during pregnancy, compared to routine antenatal care (control group). However, obstetrical outcomes after treatment for FoC had often not been extensively evaluated; Only one RCT reported more uncomplicated vaginal deliveries after psychoeducation compared to conventional surveillance[18]. Another study failed to show a decrease in planned caesarean sections after cognitive therapy compared to care-as-usual[16].

1.1.3 Childbirth-related post-traumatic stress disorder (PTSD)

Approximately 10% of Dutch mothers experience childbirth as a traumatic event[20,21] and an average of 3% of all women will develop PTSD following childbirth[22]. These risks are higher in case of complicated pregnancy or childbirth[23–25]; however, medically uncomplicated deliveries may also result in PTSD after childbirth. Previous studies have shown that besides objective risk factors, such as operative birth, negative subjective birth experience is also an important risk factor for a traumatic childbirth, including feelings of lack of support[25], feelings of loss of control, and issues of communication[26]. This makes PTSD following childbirth in uncomplicated deliveries more difficult to recognize. In addition, recognition of childbirth-related PTSD in the postpartum period is challenging because non-pathological physiological changes in this period include recurrent thoughts about the delivery, changes in emotions, sleep, concentration and irritability, which may result in both false-positive and false-negative diagnoses of PTSD.

If childbirth-related PTSD is not recognized and treated adequately, it can still be present and potentially increase in severity in subsequent pregnancy[27]. Although evidence-based guidelines recommend first-line treatments such as trauma-focused cognitive therapy (CBT), exposure therapy, and eye movement desensitization and reprocessing (EMDR) therapy[28,29], pregnant women are often excluded or underrepresented in clinical research. At the start of this thesis, only two very small uncontrolled studies were available to evaluate the effects of treatment for PTSD (symptoms) during pregnancy. Both studies evaluated EMDR therapy in a total of only four pregnant women, and found that EMDR therapy was safe and effective for treating PTSD following previous childbirth in these pregnant women[30,31]. Therefore, further research on the treatment of PTSD after childbirth in pregnant women is needed to provide evidence-based guidance for healthcare providers and expectant mothers.

In addition to determining the efficacy of interventions aimed at reducing FoC and PTSD in pregnant women, it is important to evaluate the psychological and obstetrical safety of these interventions during pregnancy. Therapists may be reluctant to provide treatment

and worry about provoking a stress response during treatment sessions, resulting in adverse foetal or maternal effects, although there is no research to support this fear. However, it is well-established that untreated FoC and PTSD equal a continuously overactive stress system with negative foetal and maternal effects. With the growing recognition of the negative consequences of FoC and PTSD during pregnancy, it is important to conduct further studies to determine the safety and efficacy of treatments aimed at reducing FoC.

1.2 HEALTHCARE PROVIDERS

Gynaecologists (residents and attending) are often exposed to adverse events during their work, including abrupt life-threatening situations such as uterine rupture, umbilical cord prolapse, shoulder dystocia, postpartum haemorrhage, medical errors or complications, aggression, and maternal or neonatal death. In 2000, Wu introduced the term 'second victims' to refer to "*healthcare providers who are involved in an unanticipated adverse patient event, in a medical error and/or a patient related injury and become victimized in the sense that the provider is traumatized by the event*"[32]. There is indeed evidence to suggest that second victims are prone to develop PTSD[33–36], but studies on the prevalence of traumatic events and PTSD among gynaecologists had not yet been conducted at the start of this thesis. It is important for healthcare organizations to understand the impact of adverse events on their healthcare providers, as these can result in elevated rates of burnout, depression and anxiety, as well as reduced productivity, decreased job satisfaction, collateral costs, and medical errors[37–41]. Addressing these potential adverse events is important for healthcare providers' well-being and maintaining the quality of healthcare.

1.3 PURPOSE

This thesis is divided into three parts, each focusing on a specific aspect of FoC and PTSD among pregnant women and healthcare providers. The purpose of this thesis was to increase evidence-based knowledge regarding fear and trauma in obstetrics. The main aims of this thesis were:

- to develop more insight into FoC and PTSD after previous childbirth in pregnant women, and determine the efficacy and safety of trauma-focused therapy, more specifically of EMDR therapy.
- to determine the impact of traumatic events among Dutch (resident) gynaecologists and their coping mechanisms and support.

Aim Part 1 (identification):

Part 1 encompasses the **HEAR**-study (request for **H**elp in f**EAR** of Childbirth-study) and **VIP**-study (**Vi**sion of Therapists on Treatment of **P**osttraumatic Stress Disorder During pregnancy). The aim was to answer the following questions:

- What is the prevalence, course and self-reported need for help with FoC according to the gestational age in nulliparous women? (the **HEAR**-study**: Chapter** 2)
- What are the therapists' experiences, views and perceptions of PTSD treatment during pregnancy? (the **VIP**-study: **Chapter** 3)

Aim Part 2 (treatment):

Part 2 describes the results of the **OptiMUM**-study (**O**bstetrical **PT**SD **I**n Multiparae, and **M**aternal Fear of Childbirth-study). The aim was to answer the following questions:

- What is the safety and efficacy of EMDR therapy in pregnant women with FoC? (**Chapter** 5, 6 and 7)
- What is the safety and efficacy of EMDR therapy for pregnant women with PTSD after previous childbirth? (**Chapter** 4 and 5)

Aim Part 3 (healthcare providers):

Part 3 describes the **WATER**-studies (**W**ork-related **A**dverse and **T**raumatic **E**vents **R**esearch-studies) that have been conducted among (resident and attending) gynaecologists. Part 3 aims at answering the following questions:

- How prevalent are work-related traumatic events and PTSD among Dutch gynaecologists? (**Chapter** 8)
- What is the current and desired support after work-related adverse events? (**Chapter** 8)
- How is the current situation eight years after the initial WATER-study took place? (**Chapter** 9)

REFERENCES

1. Vesga-López O, Blanco C, Keyes K, Ofson M, Grant BF, Hasin DS. Psychiatric disorders in pregnant and postpartum women in the United States. Arch Gen Psychiatry. 2008;65(7):805–15.
2. Lima SAM, El Dib RP, Rodrigues MRK, Ferraz GAR, Molina AC, Neto CAP, et al. Is the risk of low birth weight or preterm labor greater when maternal stress is experienced during pregnancy? A systematic review and meta-analysis of cohort studies. PLoS One. 2018;13(7):1–15.
3. Grigoriadis S, Graves L, Peer M, Mamisashvili L, Tomlinson G, Vigod SN, et al. Maternal Anxiety During Pregnancy and the Association With Adverse Perinatal Outcomes: Systematic Review and Meta-Analysis. J Clin Psychiatry. 2018;79(5):17r12011.
4. Yonkers KA, Smith MV, Forray A, Epperson CN, Costello D, Lin H, et al. Pregnant women with posttraumatic stress disorder and risk of preterm birth. JAMA Psychiatry. 2014;71(8):897–904.
5. Räisänen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth predicts postpartum depression: A population-based analysis of 511 422 singleton births in Finland. BMJ Open. 2013;3(11):1–7.
6. Broeks CW, Choenni V, Kok R, van der Voorn B, de Kruijff I, van den Akker ELT, et al. An exploratory study of perinatal hair cortisol concentrations in mother–infant dyads with severe psychiatric disorders versus healthy controls. BJPsych Open. 2021;7(1):1–9.
7. Cottrell EC, Seckl JR. Prenatal stress, glucocorticoids and the programming of adult disease. Front Behav Neurosci. 2009;3(19).
8. Knight M, Bunch K, Tuffnell D, Patel R, Shakespeare J, Kotnis R, et al. Improving Mother's Care - Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2017-19. on behalf of MBRRACE-UK. Saving Lives,. 2021. 36–51 p.
9. Adams SS, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: A study of 2206 women with intended vaginal delivery. Br J Obstet Gynaecol. 2012;119:1238–1246.
10. Söderquist J, Wijma B, Thorbert G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. Br J Obstet Gynaecol. 2009;116(5):672–80.
11. Lukasse M, Schei B, Ryding EL, Group on behalf of BS. Prevalence and associated factors of fear of childbirth in six European countries. Sex Reprod Healthc [Internet]. 2014;5(3):99–106. Available from: http://dx.doi.org/10.1016/j.srhc.2014.06.007
12. Nilsson C, Hessman E, Sjöblom H, Dencker A, Jangsten E, Mollberg M, et al. Definitions, measurements and prevalence of fear of childbirth: A systematic review. BMC Pregnancy Childbirth. 2018;18(1).
13. Garthus-Niegel S, Størksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol. 2011;32(3):160–3.
14. Raïsanen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. Br J Obstet Gynaecol. 2014;121(8):965–70.
15. Størksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective caesarean section: a population-based study. BMC Pregnancy Childbirth. 2015;17(15):221.
16. Saisto T, Salmela-Aro K, Nurmi JE, Könönen T, Halmesmäki E. A randomized controlled trial of intervention in fear of childbirth. Obstet Gynecol. 2001;89(5):820–6.

17. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Ryding EL, et al. Group psychoeducation with relaxation for severe fear of childbirth improves maternal adjustment and childbirth experience – a randomised controlled trial. J Psychosom Obstet Gynaecol. 2015;36(1):1–9.

18. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Obstetric outcome after intervention for severe fear of childbirth in nulliparous women - randomised trial. Br J Obstet Gynaecol. 2013;120(1):75–84.

19. Toohill J, Fenwick J, Gamble J, Creedy DK, Buist A, Turkstra E, et al. A Randomized Controlled Trial of a Psycho-Education Intervention by Midwives in Reducing Childbirth Fear in Pregnant Women. Birth. 2014;41(4):384–94.

20. Stramrood CAI, Paarlberg KM, Huis In't Veld EMJ, Berger LWAR, Vingerhoets AJJM, Weijmar Schultz WC, et al. Posttraumatic stress following childbirth in homelike- and hospital settings. J Psychosomic Obstet Gynaecol. 2011;32(2):88–97.

21. van der Pijl MSG, Verhoeven CJM, Verweij R, van der Linden T, Kingma E, Hollander MH, et al. Disrespect and abuse during labour and birth amongst 12,239 women in the Netherlands: a national survey. Reprod Health [Internet]. 2022;19(1):1–16. Available from: https://doi.org/10.1186/s12978-022-01460-4

22. Kranenburg L, Lambregtse-van den Berg M, Stramrood C. Traumatic Childbirth Experience and Childbirth-Related Post-Traumatic Stress Disorder (PTSD): A Contemporary Overview. Int J Environ Res Public Health. 2023;20(4).

23. Yildiz PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. J Affect Disord. 2016;18(2).

24. Grekin R, O'Hara M. Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. Clin Psychol Rev. 2014;34(4):389–401.

25. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016 Apr 16;46(06):1121–34.

26. Hollander MH, van Hastenberg E, van Dillen J, van Pampus MG, de Miranda E, Stramrood CAI. Preventing traumatic childbirth experiences: 2192 women's perceptions and views. Arch Womens Ment Health. 2017;20(4).

27. Beck CT, Watson S. Subsequent Childbirth After a Previous Traumatic Birth. 2010;59(4):241–9.

28. NICE. Post-traumatic stress disorder. Evidence reviews on care pathways for adults, children and young people with PTSD. 2018. p. Retrieved from https://www.nice.org.uk/ guidance/n.

29. ISTSS. The ISTSS PTSD Prevention and treatment guidelines. Methodology and Recommendations and Position on Complex PTSD. 2018.

30. Sandström M, Wiberg B, Wikman M, Willman AK, Högberg U. A pilot study of eye movement desensitisation and reprocessing treatment (EMDR) for post-traumatic stress after childbirth. Midwifery. 2008;24(1):62–73.

31. Stramrood CAI, Van der Velde J, Doornbos B, Paarlberg KM, Weijmar Schultz WC, Van Pampus MG. The patient observer: eye-movement desensitization and reprocessing for the treatment of posttraumatic stress following childbirth. Birth. 2012;39(1):70–6.

32. Wu AW. Medical error: the second victim. BMJ. 2000;320(March):726–7.

33. Coby J, Boer D, Lok A, Van E, Duivenvoorden HJ, Bakker AB, et al. Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression : A meta-analysis. Soc Sci Med [Internet]. 2011;73(2):316–26. Available from: http://dx.doi.org/10.1016/j.socscimed.2011.05.009

34. Gold KJ, Kuznia AL, Hayward RA. How Physicians Cope With Stillbirth or. 2008;112(1):29–34.

35. Ruitenburg MM, Frings-dresen MHW, Sluiter JK. The prevalence of common mental disorders among hospital physicians and their association with self-reported work ability : a cross-sectional study. BMC Health Serv Res [Internet]. 2012;12(1):1. Available from: BMC Health Services Research

36. Sheen K, Slade P. The efficacy of 'debriefing' after childbirth: Is there a case for targeted intervention? J Reprod Infant Psychol. 2015;33(3).

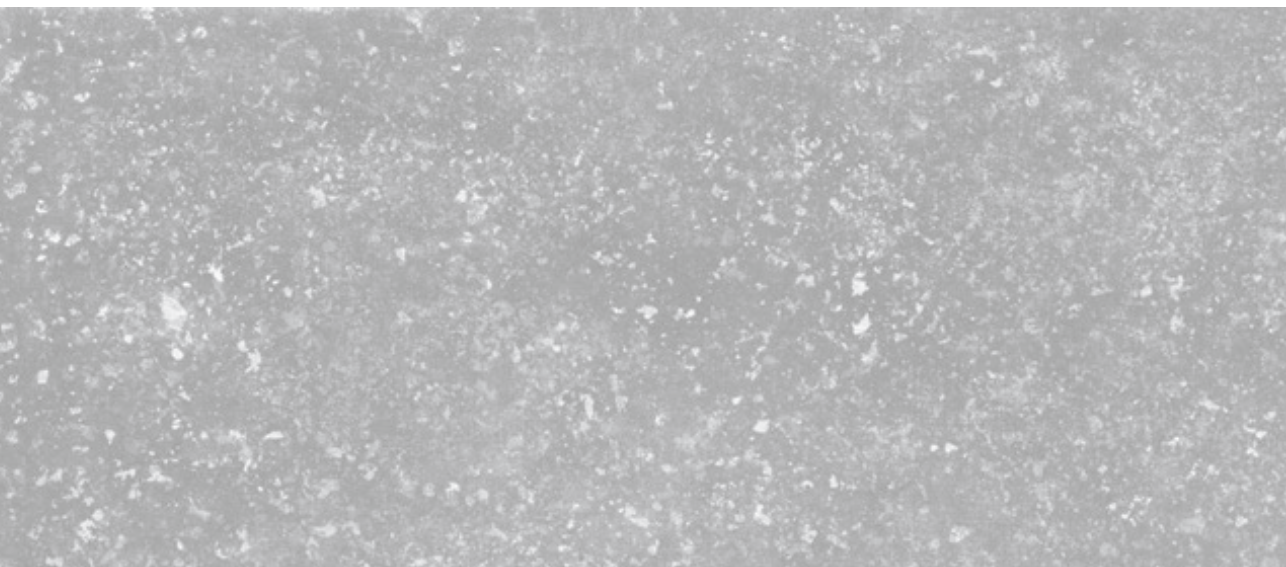
37. Dewa CS, Jacobs P, Thanh NX. An estimate of the cost of burnout on early retirement and reduction in clinical hours of practicing physicians in Canada. BMC Heal Serv Res. 2014;14:254.

38. Dewa CS, Loong D, Bonato S, Thanh NX, Jacobs P. How does burnout affect physician productivity? A systematic literature review. BMC Heal Serv Res. 2014;14:325.

39. Stergiopoulos E, Cimo A, Cheng C, Bonato S, Dewa CS. Interventions to improve work outcomes in work-related PTSD: A systematic review. BMC Public Health [Internet]. 2011;11(1):838. Available from: http://www.biomedcentral.com/1471-2458/11/838

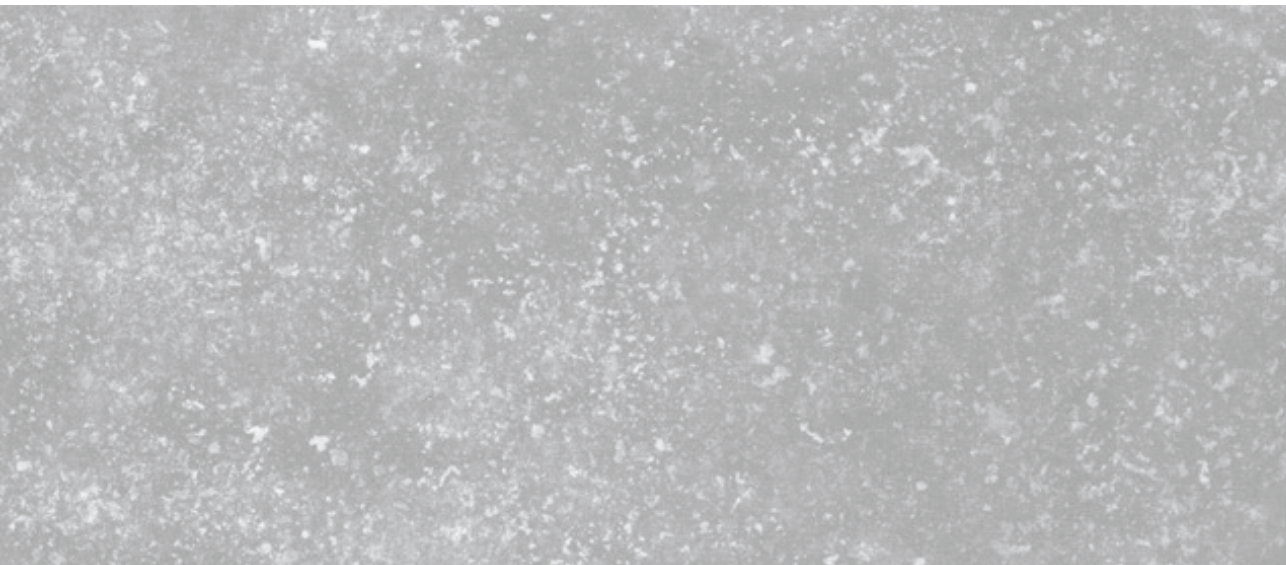
40. Waterman A, Garbutt J, Hazel E, Dunagan W, Levinson W, Fraser V, et al. The emotional impact of medical errors on practicing physicians in the United States and Canada. Jt Comm J Qual Patient Saf. 2007;33(8):467–76.

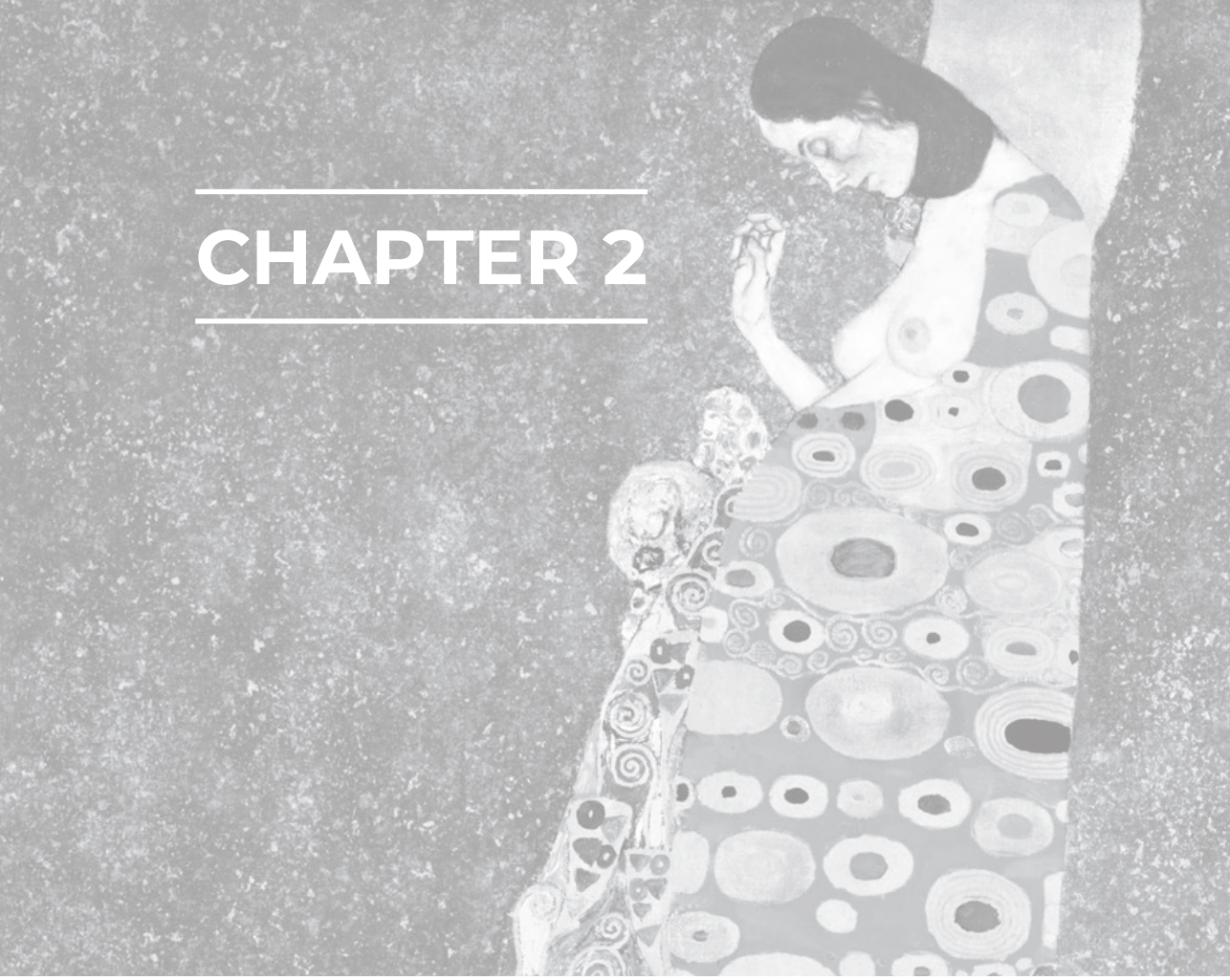
41. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, et al. Association of perceived medical errors with resident distress and empathy: A prospective longitudinal study. Jama. 2006;296(9):1071–8.



PART 1

IDENTIFICATION





CHAPTER 2

Fear of childbirth in nulliparous women

Hendrix YMGA, Baas MAM, Vanhommerig JW, de Jongh A, van Pampus MG. Fear of Childbirth in Nulliparous Women. Front Psychol. 2022;13:923819. doi: 10.3389/fpsyg.2022.923819.

ABSTRACT

Purpose

The relation between fear of childbirth (FoC) and gestational age is inconclusive, and self-reported need for help regarding this fear has never been investigated. This study aimed to determine the prevalence and course of FoC according to gestational age, to identify risk factors for the development of FoC, the influence of this fear on preferred mode of delivery, and self-reported need for help.

Methods

Nulliparous pregnant women of all gestational ages completed an online survey. The study consisted of a cross-sectional and a longitudinal analysis. Women who completed the survey in the first or second trimester (T0) were approached again in their third trimester (T1). The Wijma Delivery Expectancy Questionnaire Version A (W-DEQ A) was used with a cut-off score≥85 to define presence of fear of childbirth. Questionnaires indexing social support, anxiety, symptoms of depression, preferred mode of delivery, and self-reported need for help were included.

Results

In total, 364 women were enrolled at T0, and 118 out of 184 eligible women were included in the longitudinal analysis. Point prevalence of FoC at T0 was 18.4% with no significant difference between trimesters. In the longitudinal sample, the prevalence of FoC decreased from 18.6% (T_0) to 11.0% (T_1), $p = 0.004$. Although mean scores for FoC decreased significantly, $p < 0.001$, scores increased in 41 (34.7%) women. The presence of FoC was associated with elevated anxiety, less family support, prenatal care of the obstetrician by choice, preference for a cesarean section, and for pain relief. Women with FoC were more likely to actively seek for help compared to women without FoC.

Conclusion

While FoC is common in each trimester, prevalence decreases over the course of pregnancy. Women with FoC are often actively seeking for help, suggesting that this fear should be addressed better, and help should be offered accordingly.

INTRODUCTION

Prevalence rates of fear of childbirth (FoC) differ across countries and measurement methods, ranging from 4% to 20%[1,2]. Literature on the etiology of FoC in nulliparous women suggests that its multifactorial cause of anxiety, depression, and low social support is found to be related to FoC[3-6]. Thus, FoC is a common fear among pregnant women with some women being more vulnerable to the development of FoC than others.

Fear of childbirth could influence preferred and actual mode of delivery as well as psychological well-being in the postpartum period. Pregnant women with FoC have been found to be more likely prefer epidural analgesia in a vaginal delivery and a planned cesarean section[7-10]. Yet, CS rates differ across countries, including views on performing cesarean sections upon maternal request without medical necessity[11,12]. This may explain why some studies found FoC to be related to a longer labor duration[13] and a greater likelihood of an (unplanned) CS[14-16], whereas other studies could not detect a relation between FoC and (preferred) mode of delivery[17,18]. Regarding the postpartum period, a meta-analysis found that FoC in pregnancy was associated with postpartum posttraumatic stress disorder[19]. Hence, since FoC could lead to adverse physical and psychological outcomes during delivery and the postpartum period, identifying and treating FoC in pregnancy is important.

To find the optimum time to identify and treat women with FoC, knowledge about the course of FoC over time is important. However, regarding the course of FoC during pregnancy, literature shows conflicting results[20-25]. Longitudinal studies found either that FoC decreased[21,22] or increased[20] as pregnancy progressed. Also, no relation between FoC and gestational age[25] or conflicting patterns between women have been observed[23,24]. Since the course of FoC during pregnancy seems to differ across studies, the relation between FoC and gestational age is inconclusive.

Currently, there is no uniform guideline on screening for FoC in pregnancy. In addition, it is unclear whether pregnant women feel they are adequately provided with information about, and help with, FoC and whether women would prefer to receive additional help. To date, no studies have examined self-reported need for help in relation to FoC. If it proves to be the case that women themselves would like to receive additional help apart from the already provided pregnancy care, this would justify implementing help for FoC more standardly in the care than it is currently being done. Inherently, it is then also important to know when to screen for FoC and to provide this help. Therefore, the purpose of the present study was to determine the prevalence and course of FoC according to gestational age in nulliparous women and to evaluate self-reported need for help. We formulated the following main research questions. First, what is the prevalence and course of FoC in nulliparous pregnant women? And secondly, do nulliparous pregnant women express a need for help for FoC? Furthermore, since the literature has found

multiple risk factors and consequences of FoC, we aimed to identify factors associated with FoC, and influence of FoC on the preferred mode of delivery

MATERIAL AND METHODS

This observational survey study consisted of a cross-sectional analysis and subgroup longitudinal analysis among a convenience sample of pregnant women. Women were recruited from February 2019 to January 2020 through a city hospital (OLVG) and several midwifery practices in Amsterdam, Netherlands. Nulliparous women received a flyer about the study after their appointment with their obstetrician or at the midwifery practice. In the Netherlands, obstetric care is divided between community midwifes (primary care), obstetrician-gynecologists (secondary care), and academic referral centers (tertiary care). To distinguish which care is needed, risk selection takes place based upon a national list of recommendations (List of Obstetric Indications[26]). For women with a low-risk profile, a community midwife can provide care. When needed, women are referred to an obstetrician. Women can also choose secondary care without medical necessity. The flyer included information about the study, the inclusion criteria, and the address for the study website where they could receive more detailed information. Furthermore, pregnant women were recruited through social media such as pregnancy websites, LinkedIn, Facebook, and Instagram where information about the study and the URL to the study website was also provided.

The website of the study contained the patient information and the informed consent form. When interested in participating in the study, women entered their personal e-mail address on the study's website. The personal e-mail address was then sent to one of the authors (YH) via a password-secured data file. Bias from possible repeated entry was prevented by ensuring e-mail addresses were not identical. The women were subsequently sent a personalized link to the online questionnaire (T0) through Castor EDC[27]. The questionnaire could be completed on any electronic device that was connected to the internet and there was no specific time limit to complete the survey. There was no interference from the researcher during this time. Once fully completed, the answers could not be changed. There were no printed questionnaires used. Women who completed the questionnaire in their first or second trimester received an e-mail with a personalized link around the 35th gestational week to complete the same questionnaire(s) once more (T1). Eligible for the study were nulliparous women of all gestational ages. Exclusion criteria were multiparous women (defined as a previous pregnancy of ≥16weeks), women who were younger than 18 years old, or who did not speak the Dutch language. Incomplete questionnaires were excluded.

The questionnaire included questions regarding demographics and obstetrical characteristics [i.e., age, gestational age, country of birth, partner, care led by midwife/ gynecologist by choice/ gynecologist for medical reasons, self-reported (history of)

physical health, (history of) psychological treatment, medication use, previous pregnancies less than 16 weeks, fertility treatment, planned pregnancy, pregnancy complications, preferred mode and place of birth], validated questionnaires for FoC, anxiety, depression, social support as well as questions pertaining to need for help. The questions on socio-demographic background factors and obstetrical characteristics were pretested and validated by subject matter experts including gynecologists (in training), psychologists and a psychiatrist. Since the other questionnaires used were well validated, we did not pretest those questions.

Fear of childbirth was assessed using the W-DEQ Version A[28]. The W-DEQ A is a 33-item self-report questionnaire measuring FoC scored on a six-point Likert scale. Total scores vary from 0 to 165, with higher scores indicating higher FoC. The W-DEQ A has good psychometric properties with a high internal consistency (Cronbach's alpha ≥0.87[28]). A cut-off score of ≥85 to indicate clinically relevant FoC has been mostly used and recommended[28,29]. It has been translated to Dutch[30].

Symptoms of anxiety and depression were measured using the Hospital Anxiety and Depression Scale (HADS), a validated self-report questionnaire consisting of 14 items to measure anxiety and depressive symptoms[31]. Each item can be scored from 0 to 3 using a score range from 0 to 21 on each subscale with higher scores indicating more symptoms. It has been translated and validated in the Dutch population with a Cronbach's alpha of 0.84 and 0.79 for the anxiety and depression scale, respectively[32].

Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS) which is a validated 12-item self-report questionnaire measuring support from family, friends, and a significant other[33]. Each item is scored from 1 to 7 with higher scores indicating more social support. The MSPSS has been validated in the pregnant population, with Cronbach's alpha varying from 0.90 to 0.94 for the different subscales[34]. It has been translated and validated in the Dutch population[35]. Self-reported need for help was explored by one or multiple questions, depending on whether the woman was already receiving help. The question for need for help was designed using Prochaska's stages of behavioral change[36], namely: 'For fear of childbirth ("I do not need extra guidance right now, I have no problems at the moment" vs. "I am still doubting if I want extra guidance" vs. "I'm actively searching for extra help" vs. "I am currently receiving extra help" vs "I have already received and completed help for fear of childbirth"). If the woman answered "I do not need extra guidance right now, I have no problems at the moment' no follow-up question was asked. Otherwise, participants were asked about their preference for the type of health professional and timing of additional help.

Statistical analyses

Before analyzing the data, women were divided into three categories according to the gestational trimester (i.e., 0–12weeks; 13–27weeks; 28–42weeks). Scores on the W-DEQ

A were dichotomized using a cut-off score of ≥85 to determine the presence of FoC[28]. Descriptive statistics were used to describe socio-demographic and clinical data in absolute numbers and percentages. Groups were divided according to the presence of FoC yes/no. A Mann–Whitney U test was conducted comparing age and gestational age. A Chi-square test was used to compare categorical variables. The effect of gestational age on FoC was determined by performing a one-way ANOVA and Pearson's Chi-square test. For the longitudinal analyses, change in W-DEQ A scores was analyzed by a paired samples t-test. A McNemar analysis was performed to analyze within-patient differences in prevalence rates over time. Logistic regression analyses were performed to identify potential predictors for the course of FoC (increase vs. decrease in scores on FoC). To assess potential significant variables and confounders, univariable regression analyses were carried out while potential risk factors for FoC, the preferred mode of delivery (vaginal birth or cesarean section, and pain relief), and preferred place of birth (at home or in the hospital) were determined using multivariable logistic regression analyses. To explore self-reported need for help for FoC, a separate logistic regression analysis was performed using the question on the need for help as a predictor of the presence of FoC. Only complete surveys were included in the analyses so there were no missing data.

Drop-out analyses were conducted to research potential differences between responders and drop-outs at T0 and T1 (i.e., lost to follow-up or incomplete questionnaires). Means and standard deviations are given as (M±SD). When data were not normally distributed, median and interquartile ranges are presented. Statistical differences were indicated as $p < 0.05$ (reported P is two-sided). Results of regression analyses are presented as unadjusted and adjusted odds ratios (OR) with a 95% confidence interval. All analyses were performed with the Statistical Package for Social Sciences (SPSS) version 24.0[37].

Ethical approval

Informed consent was obtained by actively checking a box agreeing to participate in the study, which was obligatory, and thereafter leaving their personal e-mail address. Furthermore, participants were provided an option to download the patient information and informed consent form. This study was exempted from ethical approval by the Medical Research Ethics Committees United (MEC-U) in Nieuwegein, Netherlands (reference number W18.188)

RESULTS

In total, 566 women agreed to participate, of which 378 (66.8%) completed the questionnaire at T0. Fourteen women were excluded because of unknown gestational age (n=12) or being multiparous (n=2), leaving 364 women to be included in the analyses. Of them, 184 (50.5%) received a follow-up questionnaire in their third trimester of pregnancy (T1) that was completed by 118 women (118/184, 64.1%; Figure 1). Background characteristics are shown in Table 1. Compared to women without FoC, women with FoC were more likely to receive care by a gynecologist by choice (p=0.020), more often had a history of psychological treatment (p=0.031), or were currently receiving psychological treatment (p=0.009). Analyses on differences in demographics between completers and non-completers at T0 showed that women who completed the questionnaire more often reported a history of psychological treatment (47.8 vs. 30.2%), p=0.029, and a high level of education (71.7 vs. 40.4%) than the non-completers, p<0.001. No other demographic variables were statistically significantly different between the completers and non-completers.

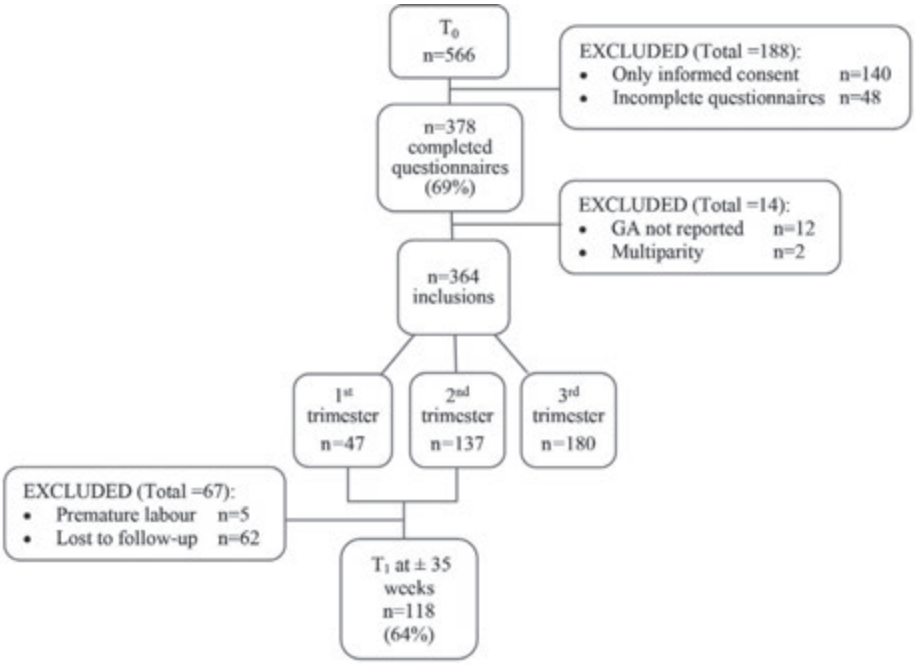


Figure 1. Flow diagram participants. Flowchart of participant. For the longitudinal sample, two participants (i.e., 'not received') did not receive a questionnaire at T1 because of a technical issue.

Table 1. Socio-demographic variables and obstetric characteristics compared per group

Characteristics	Total n=364	FoC n=67 (18.4%)	No FoC n=297 (81.6%)	*P*-value
Maternal age (years), median (range)	30 (28-33)	31 (28-35)	30 (28-33)	0.082
Gestational age (weeks), median (range)	27 (17-35)	26 (16-33)	28 (17-35)	0.373
Trimester n(%)				0.406
First trimester	47 (12.9)	8 (11.9)	39 (13.1)	
Second trimester	137 (37.6)	30 (44.8)	107 (36.0)	
Third trimester	180 (49.5)	29 (43.3)	151 (50.8)	
Educational level[1] n(%)				0.315
Low	10 (2.7)	1 (1.5)	9 (3,0)	
Middle	93 (25.5)	13 (19.4)	80 (26.9)	
High	261 (71.7)	53 (79.1)	208 (70.0)	
Country of birth n(%)				0.069
The Netherlands	343 (94.2)	60 (89.6)	283 (95.3)	
Other	21 (5.8)	7 (10.4)	14 (4.7)	
Partner status n(%)				0.487
No partner	10 (2.7)	1 (1.5)	9 (3.0)	
Partner	364 (97.3)	4 (98.5)	288 (97)	
Care led by n(%)				**0.020**
Midwifery practice	264 (72.5)	43 (64.2)	221 (74.4)	
Gynecologist (choice)	16 (4.4)	7 (10.4)	9 (3.0)	
Gynecologist (medical)	84 (23.1)	17 (25.4)	67 (22.6)	
Self-reported health n(%)				0.820
Healthy	340 (93.4)	63 (94.0)	277 (93.3)	
Not healthy	24 (6.6)	4 (6.0)	20 (6.7)	
History of physical illness n(%)				0.978
No	245 (67.3)	45 (67.2)	200 (67.3)	
Yes	119 (32.7)	22 (32.8)	97 (32.7)	
Medication n(%)				0.349
No	287 (78.8)	50 (74.6)	237 (79.8)	
Yes	77 (21.2)	17 (25.4)	60 (20.2)	
History of psychological treatment n(%)				**0.031**
No	190 (52.2)	27 (40.3)	163 (54.9)	
Yes	174 (47.8)	40 (59.7)	134 (45.1)	
Current psychological treatment(%)				**0.009**
No	337 (92.6)	57 (85.1)	280 (94.3)	
Yes	27 (7.4)	10 (14.9)	17 (5.7)	
History of Previous pregnancy under 16 weeks n(%)				0.133
No	249 (68.4)	51 (76.1)	198 (66.7)	
Yes	115 (31.6)	16 (23.9)	99 (33.3)	

Table 1. Socio-demographic variables and obstetric characteristics compared per group (continued)

Characteristics	Total n=364	FoC n=67 (18.4%)	No FoC n=297 (81.6%)	*P*-value
Fertility treatment n(%)				0.544
No	312 (85.7)	59 (88.1)	253 (85.2)	
Yes	52 (14.3)	8 (11.9)	44 (14.8)	
Planned pregnancy n(%)				0.238
No	49 (13.5)	12 (17.9)	37 (12.5)	
Yes	315 (86.5)	55 (82.1)	260 (87.5)	

[1] Educational levels: low = primary school and preparatory secondary education; middle = senior general secondary education, secondary vocational education and pre-university education; high= higher professional education and university education.

Fear of Childbirth

The overall prevalence rate of FoC was 18.4% (n=67) and did not differ across trimesters $\chi 2$ (2, N=364)=1.80, p= 0.406. In the total cross-sectional sample, the mean sum score on the W-DEQ A (65.8±23.0) did not significantly differ across trimesters, F (2, 361)=0.36, p=0.700. For women with FoC in the cross-sectional sample, a significant difference in mean scores across trimesters was found (F, 2, 64)=3.67, p=0.031); a Tukey post-hoc test revealed that mean score was significantly lower for women in their third trimester compared to women in their first trimester (Table 2).

Longitudinal group

In total, 118 out of 184 eligible women (64.1%) completed the questionnaire again around the 35th week of pregnancy (T1). Two women did not receive the questionnaire due to a technical issue. Women who completed the questionnaire at T1 significantly more often reported a high educational level (n=97, 82.2%) than drop-outs (n=33, 56.9%), $\chi 2$=13.746, p=0.001. The W-DEQ A mean score at T0 was not significantly different between completers (65.6±26.6) and drop-outs (68.4±23.6), t(174)=0.691, p=0.347. No significant difference in the prevalence of FoC at T0 between completers (n=22, 18.6%) and drop-outs (n=13, 22.4%) was found, $\chi 2$=0.347, p=0.556.

The proportion of women with FoC decreased from 18.6% (22/118) at T0 to 11.0% (13/118) at T1, p = 0.004. For the total group, the group with FoC at T0 and without FoC at T0, W-DEQ A mean scores significantly decreased over time (Table 3). Individually, an increase in score on FoC was found in 41 (37.4%) women, with a mean increase of 8.1 ± 7.1 points on the W-DEQ A. Of those women, 37 women had a score below the cut-off of ≤85 at both timepoints and four women had FoC at both time points. There were no women who developed FoC over time; all women who had FoC at T1, also had FoC at T0. No significant predictors for an increase in score on FoC over time were found.

Table 2. Means, standard deviations and One-Way ANOVA on scores on the WDEQ-A

	W-DEQ A scores per trimester												
Group	*First*		*Second*		*Third*		*Total*		**ANOVA**			**Tukey's HSD comparisons[a]**	
	n (%)	M±SD	*n* (%)	M±SD	*n* (%)	M±SD	*n* (%)	M±SD	df	F-ratio	Value of p		
Total	47(12.9)	66.9±28.9	137 (37.6)	66.8 ± 24.0	180 (49.5)	64.8 ± 20.5	364 (100)	65.8 ± 23.0	2	0.36	0.700	First vs. second	0.080
FoC	8 (11.9)	112.6±20.3	30 (44.8)	99.8 ± 15.7	29 (43.3)	96.7 ± 11.8	67 (18.4)	100.0 ± 15.3	2	3.67	**0.031**	First vs. third	0.023
No FoC	39 (13.1)	57.6±20.1	107 (36.0)	57.6 ± 16.7	151(50.8)	58.7 ± 15.8	297 (81.6)	58.1 ± 16.6	2	0.16	0.849	Second vs. Third	0.704

* For FoC group.

Table 3. Changes in W-DEQ A scores in the longitudinal sample.

Group	**N (%)**	**WDEQ-A over time (M±SD)**		**Paired t-test**		
		T_0	T_1	***t*-value**	**df**	**Value of p**
Total group	118 (100)	65.6 ± 26.6	59.1 ± 24.2	4.356	117	<0.001
FoC at T_0	22 (18.6)	106.3 ± 16.9	87.8 ± 27.7	3.774	21	0.001
No FoC at T_0	96 (81.4)	56.3 ± 18.3	52.5 ± 17.7	2.855	95	0005

Paired sample t-tests were done to compare scores on the W-DEQ A over time. df=degrees of freedom

Table 4. Multivariate logistic regression analysis on risk factors for FoC

	FoC (+)	FoC (-)				
	n=67 Mdn (IQR) n(%)	**n=297 Mdn (IQR) n(%)**	**OR (95% CI)**	***P***	**aOR (95% CI)**	***P***
Depression[1]	4 (2-9)	3 (2-5)	1.1 (1.0-1.2)	0.002	0.9 (0.8-1.0)	0.080
Anxiety[1]	8 (5-11)	4 (2-6)	1.3 (1.2-1.4)	<0.001	1.3 (1.2-1.5)	**<0.001**
Social support family[2]	5.5 (4.5-6.8)	6.5 (5.8-7.0)	0.6 (0.5-0.7)	<0.001	0.7 (0.6-0.9)	**0.003**
Social support friends[2]	6.0 (5-6.8)	6.5 (5.8-7.0)	0.7 (0.6-0.8)	<0.001	-	-
Social support SO[2]	6.8 (6.0-7.0)	7 (6.5-7.0)	0.7 (0.5-0.95)	0.023	-	-
Care led by[3]						
Gynecologist (choice)	7 (10.4)	9 (3.0)	4.0 (1.4-11.3)	0.009	4.1 (1.2-13.5)	**0.020**
Gynecologist(medical)	17 (25.4)	67 (22.6)	1.3 (0.7-2.4)	0.405	-	-
Current psychological treatment [4]	10 (14.9)	17 (5.7)	2.9 (1.3-6.6)	0.012	1.3 (0.5-3.3)	0.950
History of psychological treatment[4]	40 (59.7)	134 (45.1)	1.8 (1.1-3.1)	0.032	0.9 (0.5-1.7)	0.800

Multivariate logistic regression analyses was performed to identify potential risk factors for FoC. OR=Odds ratio, aOR=adjusted Odds ratio, CI=confidence interval.

[1] HADS

[2] MSPSS, SO= significant other

[3] ref category= midwifery practice

[4] ref category= no.

Table 5. Preference for mode of delivery and self-reported need for help for FoC

	FoC (+)	FoC (-)				
	n=67 n(%)	n=297 n(%)	OR (95% CI)	*P*	aOR (95% CI)[1]	*P*
Preference for[a]						
Cesarean section[b]	16 (23.9)	9 (3)	10.0 (4.2-23.9)	<0.001	9.2 (3.5-24.4)	<0.001
Pain relief[c]						
I do not know yet	28 (41.8)	133 (44.8)	2.7 (1.3-5.9)	0.01	3.1 (1.3-7.0)	0.008
Yes	29 (43.3)	34 (11.4)	11.1 (4.9-25.0)	<0.001	9.3 (3.7-23.5)	<0.001
Hospital birth[d]	57 (85.1)	202 (68.0)	2.7 (1.3-5.5)	0.007	2.1 (1.0-4.5)	0.06
For fear of childbirth I (am)..[e]						
Don't need extra help	21 (31.3)	242 (81.5)	-	-	-	-
Doubting if I want extra help	21 (31.3)	36 (12.1)	6.7 (3.3-13.5)	<0.001	6.3 (3.0-13.0)	**<0.001**
Actively searching for help	13 (19.4)	8 (2.7)	18.7 (7.0-50.3)	<0.001	17.5 (6.4-47.7)	**<0.001**
Currently receiving help	12 (17.9)	6 (2.0)	23.0 (7.9-67.6)	<0.001	21.6 (7.3-64.4)	**<0.001**
Had extra help and completed guidance	0 (0)	5 (1.7)	0.000	0.999	-	-

Separate logistic regression analyses were performed for preferred mode of delivery and for self-reported need for hep for FoC. OR=odds ratio, aOR=adjusted odds ratio, CI=confidence interval.

[a] aOR is adjusted for health care provider, current psychological problems or treatment, score on the HADS-Anxiety, and social support from family.

[b] ref category=vaginal birth.

[c] ref category=no pain relief.

[d] ref category=home birth.

[e] *aOR is adjusted for baseline characteristics history of psychological problems requiring treatment or current psychological treatment.*

Bold values are statistically significant (p<0.05)

Risk Factors and Mode of Delivery

Multivariable logistic regression analysis showed that a higher score on anxiety, lower social support from family, and choosing to be in medical prenatal care was associated with the presence of FoC (Table 4). FoC was significantly associated with a preference for a planned CS and for pain relief during delivery, but not with a preference for place of birth (Table 5).

Self-Reported Need for Help

Women with FoC were more likely to be still in doubt whether they wanted extra help, actively seeking for help, or already receiving extra help compared to women without FoC (Table 5). There was no statistically significant difference between the need for help and receiving care from a midwife, an obstetrician by medical necessity, or by choice, χ^2 (4, N = 364) = 7.32, p = 0.120.

Help for FoC was most often wanted or received from a midwife (63.4%, n = 64), gynecologist (26.7%, n = 27), or psychologist (19.8%, n = 20). Preference for the timing of help for FoC was indicated as: "*As soon as possible"* in 15.4% (n = 12), "*Far before delivery (around 30–35weeks gestational age)*" in 55.1% (n = 43), or "*Just before the delivery (after 35weeks gestational age"* in 25.6% (n = 20). Three women (3.8%) answered "*Different timing*" but did not specify what the preferred timing of help was.

DISCUSSION

This study used both a cross-sectional as well as a longitudinal group, to research the prevalence and course of FoC during pregnancy. In support of our main hypothesis, results showed that FoC was common among women with an average prevalence rate of 18.4%. In our longitudinal sample, both prevalence and mean score of FoC significantly decreased over time. Further, the presence of FoC was found to be related to less family support, elevated anxiety, and prenatal care of the obstetrician by choice. Regarding the influence of FoC on preferred mode of delivery, women with FoC were more likely to prefer a cesarean section and pain relief, compared to those without FoC. Another important finding was that women with FoC were more likely to be actively seeking for help compared to women without FoC.

Our results on the prevalence and course of FoC are partially in line with previous literature[2, 5, 21, 22, 38, 39]. The prevalence rate of FoC (18.4%) in the present study is somewhat higher than in a recent meta-analysis[2] albeit there is a wide variety in prevalence rates across countries. In line with previous studies[5,38,39], we did not observe a relation between gestational age and FoC in the cross-sectional group overall. However, for women with FoC, we did see that women in their third trimester scored significantly lower on FoC than those in their first trimester. In the longitudinal sample, we found an overall decrease in prevalence and mean scores of FoC over the course of pregnancy. Yet, patterns differed

individually with a minority of women showing an increase in scores over time while no predictors for this increase were found. Importantly, even though in some women scores on FoC increased, no women in our sample developed clinically relevant FoC over the course of their pregnancy, which is opposed to women in a previous study who did develop FoC over time as measured by the Fear of Birth Scale[21]. Furthermore, women either had clinically relevant FoC throughout their pregnancy, or FoC decreased to below the cut-off in the third trimester. This suggests that screening negative at the beginning of pregnancy may reduce the likelihood of developing FoC over time while the other way around is more plausible in that FoC decreases later on in pregnancy. Therefore, we suggest that women should be screened for FoC at the beginning of pregnancy. Next, women should be counseled about treatment options for FoC and the possibility of spontaneous recovery. If a woman chooses to wait with treatment, it is important to monitor FoC throughout pregnancy.

We found three risk factors to be related to FoC. Firstly, compared to women without FoC, women with FoC reported a higher level of general symptoms of anxiety, which is consistent with previous literature[3]. Secondly, less social support from family members was related to FoC, but this was not demonstrated regarding support from friends or significant others. A possible explanation for this finding might be the high level of overall social support in our sample; for instance, almost all participating women had a partner. Thirdly, women with FoC and an uncomplicated pregnancy more often chose to have prenatal care by an obstetrician. It could be that choosing prenatal care from an obstetrician might not be a risk factor for FoC, but rather reflecting a sense of security the hospital embodies, and thereby a consequence of FoC rather than a risk factor. In contrast to other studies[3,6,14], we did not find a significant relation between FoC and symptoms of depression, which may be explained by the overall low scores on depression in our study.

Regarding the preferred mode of delivery, women with FoC were more inclined to have a preference for a cesarean section and for pain relief during delivery, which is also in line with previous literature[39,40].

Regarding our aim to evaluate self-reported need for help for FoC, we found that women with FoC were often actively seeking additional help. This suggests that discussing FoC with a healthcare professional may not be standard practice nor sufficient to help and support women with these problems. This notion is supported by a recent study that concluded midwives should acquire more in-depth knowledge about FoC[41]. Accordingly, it is important that after screening positive for FoC, women are referred to a trained specialist on FoC, preferably a psychologist.

Both strengths and limitations should be recognized. One strength is that this study is the first observational study with both a cross-sectional and a longitudinal sample to study the relation between FoC and gestational age in nulliparous pregnant women

while using the validated W-DEQ A questionnaire to measure FoC. Secondly, asking women whether they would like to receive help for FoC provides in-depth insight into the perspective of pregnant women and willingness for treatment of FoC. Besides mentioning these strengths, some limitations need to be noted. No significant differences were found between trimesters on the W-DEQ A score of the total sample, albeit a post-hoc power analysis showed that with the current sample size and reported means, power was <15% to detect significant differences in this group. Yet, the statistical power to detect significant differences was 99% for our longitudinal sample. Secondly, while all other demographic variables were similar, drop-out analyses at T_0 and T_1 revealed that completers significantly more often had a history of psychological treatment (T_0) and a high educational level (T_0 and T_1) in comparison to drop-outs, which may have led to attrition bias. Although efforts were made to create a diverse sample by recruiting women from multiple settings, compared to national data from the Netherlands, our sample was more often born in the Netherlands (94.2 vs. 76.8%[42]) and more often had a high educational level (71.7% vs. 53.6%[43]). These differences in country of birth and educational level may have led to an under-reporting of FoC. Namely, studies have found that risk factors for FoC include a low educational level[14,14,15,44] and being foreign born[45]. Therefore, prevalence may even be higher in the general pregnant population, underlying the importance of being attentive to FoC in pregnancy. However, other studies have not found such an association with educational level[39] or report a higher risk of FoC in women with a high educational level[46]. Future studies should aim to include a more diverse sample of pregnant women from remote areas and areas of low socioeconomic status, and to distribute a survey in multiple languages.

CONCLUSION

Fear of childbirth appeared prevalent in almost one in five women in each trimester and may decrease over time while women expressed a need for help. This highlights the need for standardized care of FoC and research into the application of screening tools and evidence-based treatments for those suffering from FoC. When pregnant women present themselves to the obstetrician, a thorough evaluation of patients' social system is recommended, and reasons for choosing medical care should be asked for while being attentive to women who suffer from general anxiety. Attention should be given to requests for delivery by a planned CS without the medical necessity to rule out the possibility of an underlying FoC. Given the combination of a high prevalence and self-reported need for help, our recommendation would be that women are routinely screened for FoC at the beginning of pregnancy. More obstetricians and midwives should be aware of what possible treatment options are and where to find these so that women can be guided.

REFERENCES

1. Nilsson C, Hessman E, Sjöblom H, Dencker A, Jangsten E, Mollberg M. Definitions, measurements and prevalence of fear of childbirth: a systematic review. BMC Pregnancy Childbirth. 2018;18:28. doi: 10.1186/s12884-018-1659-7.
2. O' Connell MA, Leahy-Warren P, Khashan AS, Kenny LC, O'Neill SM. Worldwide prevalence of tocophobia in pregnant women: systematic review and meta-analysis. Acta Obstet Gynecol Scand. 2017 Aug;96(8):907–20. doi: 10.1111/aogs.13138.
3. Dencker A, Nilsson C, Begley C, Jangsten E, Mollberg M, Patel H., et al. Causes and outcomes in studies of fear of childbirth: a systematic review. Women Birth. 2019;32(2):99–11. doi: 10.1016/j.wombi.2018.07.004.
4. Jokić-Begić N, Žigić L, Nakić Radoš S. Anxiety and anxiety sensitivity as predictors of fear of childbirth: different patterns for nulliparous and parous women. J Psychosom Obstet Gynaecol. 2014 Mar;35(1):22–8. doi: 10.3109/0167482X.2013.866647.
5. Lukasse M, Schei B, and Ryding EL. Prevalence and associated factors of fear of childbirth in six European countries. Sex Reprod Healthc. 2014 Oct;5(3)99–106. doi: 10.1016/j.srhc.2014.06.007
6. Storksen T, Eberhard-Gran M, Garthus-Niegel S, Eskild A. Fear of childbirth; the relation to anxiety and depression. Acta Obstet Gynecol Scand. 2012 Feb;91:237–242. doi: 10.1111/j.1600-0412.2011.01323.x.
7. Haines HM, Rubertsson C, Pallant JF, Hildingsson I. The influence of women's fear, attitudes and beliefs of childbirth on mode and experience of birth. BMC Pregnancy Childbirth. 2012 Jun;12:55. doi: 10.1186/ 1471-2393-12-55.
8. Raisanen S, Gissler M, Kramer MR, Heinonen S. Influence of delivery characteristics and socioeconomic status on giving birth by caesarean section – a cross sectional study during 2000-2010 in Finland. BMC Pregnancy Childbirth. 2014;14:120. doi: 10.1186/1471-2393-14-120.
9. Ryding, EL, Lukasse M, Kristjansdottir H, Steingrimsdottir T, Schei B. Pregnant women's preference for cesarean section and subsequent mode of birth - a six-country cohort study. J Psychosom Obstet Gynaecol. 2016;37(3):75–83. doi: 10.1080/0167482x.2016.1181055.
10. Sitras, V, Benth JŠ, Eberhard-Gran M. Obstetric and psychological characteristics of women choosing epidural analgesia during labour: a cohort study. PLoS One. 2017 Oct;12(10):e0186564. doi: 10.1371/journal.pone.0186564.
11. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The increasing trend in caesarean section rates: global, regional and National Estimates: 1990-2014. PLoS One. 2016 Feb;11(2):e0148343. doi: 10.1371/journal. pone.0148343
12. Habiba, M, Kaminski, M, Da Frè M, Marsal K, Bleker O, Librero J, et al. Caesarean section on request: a comparison of obstetricians' attitudes in eight European countries. BJOG. 2006 Jun;113(6):647–56. doi: 10.1111/j. 1471-0528.2006.00933.x.
13. Adams, SS, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: a study of 2206 women with intended vaginal delivery. BJOG. 2012;119(10):1238–1246. doi: 10.1111/j.1471-0528.2012.03433.x.
14. Laursen M, Johansen C, Hedegaard M. Fear of childbirth and risk for birth complications in nulliparous women in the Danish National Birth Cohort. BJOG. 2009 Sep;116(10):1350-55. doi: 10.1111/j.1471-0528.2009.02250.x.

15. Ryding EL, Lukasse M, Parys AS, Wangel AM, Karro H, Kristjansdottir H, et al. Fear of childbirth and risk of cesarean delivery: a cohort study in six European countries. Birth. 2015 Mar;42(1):48-55. doi: 10.1111/birt.12147.

16. Takacs L, Mlikova Seidlerova J, Cepicky P. Psychosocial risk factors for emergency cesarean section. Ceska Gynekol. 2019;84(1):33-9.

17. Jespersen C, Hegaard HK, Schroll AM Rosthoj, S, Kjaergaard H. Fear of childbirth and emergency caesarean section in low-risk nulliparous women: a prospective cohort study. J Psychosom Obstet Gynaecol. 2014;35(4):109-15. doi: 10.3109/0167482x.2014.952277.

18. Sluijs, AM, Cleiren MP, Scherjon SA, Wijma K. No relationship between fear of childbirth and pregnancy−/delivery-outcome in a low-risk Dutch pregnancy cohort delivering at home or in hospital. J Psychosom Obstet Gynaecol. 2012;33(3):99-105. doi: 10.3109/0167482x.2012.685905.

19. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016;46(6):1121-34. doi: 10.1017/s0033291715002706.

20. Hildingsson I, Nilsson C, Karlstrom A, Lundgren I. A longitudinal survey of childbirth-related fear and associated factors. J Obstet Gynecol Neonatal Nurs. 2011;40(5):532-43. doi: 10.1111/j.1552-6909.2011.01274.x.

21. Hildingsson I, Haines H, Karlstrom A, Nystedt A. Presence and process of fear of birth during pregnancy-findings from a longitudinal cohort study. Women Birth. 2017;30(5):e242–e247. doi: 10.1016/j.wombi.2017.02.003.

22. Huizink AC, Mulder EJ, Robles de Medina PG, Visser GH, Buitelaar JK. Is pregnancy anxiety a distinctive syndrome? Early Hum Dev. 2004;79(2):81-91. doi: 10.1016/j.earlhumdev.2004.04.014.

23. Laursen M, Hedegaard M, Johansen C. Fear of childbirth: predictors and temporal changes among nulliparous women in the Danish National Birth Cohort. BJOG. 2008;115(3):354–360. doi: 10.1111/j.1471- 0528.2007.01583.x.

24. Richens Y, Campbell M, Lavender T. Fear of birth-A prospective cohort study of primigravida in the UK. Midwifery 2019 Oct;77:101-9. doi: 10.1016/j. midw.2019.06.014.

25. Rothenberger SE, Moehler E, Reck C, Resch F. Prenatal stress: course and interrelation of emotional and physiological stress measures. Psychopathology. 2011;44(1):60–67. doi: 10.1159/000319309.

26. College voor zorgverzekeringen (College for Health Insurance) (2003). Verloskundig Vademecum 2003 (Obstetric Manual). Diemen, the Netherlands.

27. Castor, E.D.C. (2019). Castor Electronic Data Capture [Online]. Available at: https://castoredc.com (Accessed August 28, 2019).

28. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84–97. doi: 10.3109/01674829809048501.

29. Calderani E, Giardinelli L, Scannerini S, Arcabasso S, Compagno E, Petraglia F., et al. Tocophobia in the DSM-5 era: outcomes of a new cut-off analysis of the Wijma delivery expectancy/experience questionnaire based on clinical presentation. J Psychosom Res. 2019 Jan;116:37–43. doi: 10.1016/j. jpsychores.2018.11.012.

30. Wijma, K, Wijma B. (2004). Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ version A) [Online]. Available at: https://lkpz.nl/ docs/lkpz_pdf_1341779961.pdf (Accessed January 20, 2022).

31. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67, 361–370. doi: 10.1111/j.1600-0447.1983. tb09716.x

32. Spinhoven P, Ormel J, Sloekers P, Kempen G, Speckens A, van Hemert A. A validation study of the hospital anxiety and depression scale (HADS) in different groups of Dutch subjects. Psychol Med. 1997 Mar;27(2):363-70. doi: 10.1017/S0033291796004382.

33. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. J Pers Assess. 1988;52:30-41. doi: 10.1207/s15327752jpa5201_2.

34. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff, KA. Psychometric characteristics of the multidimensional scale of perceived social support. J Pers Assess. 1990;55:610-7. doi: 10.1080/00223891.1990.9674095.

35. Pedersen SS, Spinder H, Erdman RAM, Denollet J. Poor perceived social support in implantable cardioverter defibrillator (ICD) patients and their partners: cross-validation of the multidimensional scale of perceived social support. Psychosomatics. 2009;50(5):461-7. doi: 10.1016/ S0033-3182(09)70838-2.

36. Prochaska JO, Velicer WF, Rossi JS, Goldstein MG, Marcus BH, Rakowski W, et al. Stages of change and decisional balance for 12 problem behaviors. Health Psychol. 1994 Jan;13(1):39-46. doi: 10.1037/0278-6133.13.1.39.

37. Corp, I. (2016). IBM SPSS Statistics for Windows, Version 24.0. (Armonk, NY: IBM Corp).

38. Fairbrother N, Thordarson DS, Stoll K. Fine tuning fear of childbirth: the relationship between childbirth fear questionnaire subscales and demographic and reproductive variables. J Reprod. Infant Psychol. 2018Feb;36(1):15–29. doi: 10.1080/02646838.2017.1396300.

39. Nieminen K, Stephansson O, Ryding EL. Women's fear of childbirth and preference for cesarean section-a cross-sectional study at various stages of pregnancy in Sweden. Acta Obstet Gynecol Scand. 2009;88(7):807-3. doi: 10.1080/00016340902998436.

40. Sluijs AM, Wijma K, Cleiren MP van Lith, JM, Wijma B. Preferred and actual mode of delivery in relation to fear of childbirth. J Psychosom Obstet Gynaecol. 2020;41(4):266-74. doi: 10.1080/0167482X.2019.1708319.

41. de Vries NE, Stramrood CAI, Sligter LM, Sluijs AM, van Pampus MG. Midwives' practices and knowledge about fear of childbirth and postpartum posttraumatic stress disorder. Women Birth. 2020;33(1):e95–e104. doi: 10.1016/j.wombi.2018.11.014.

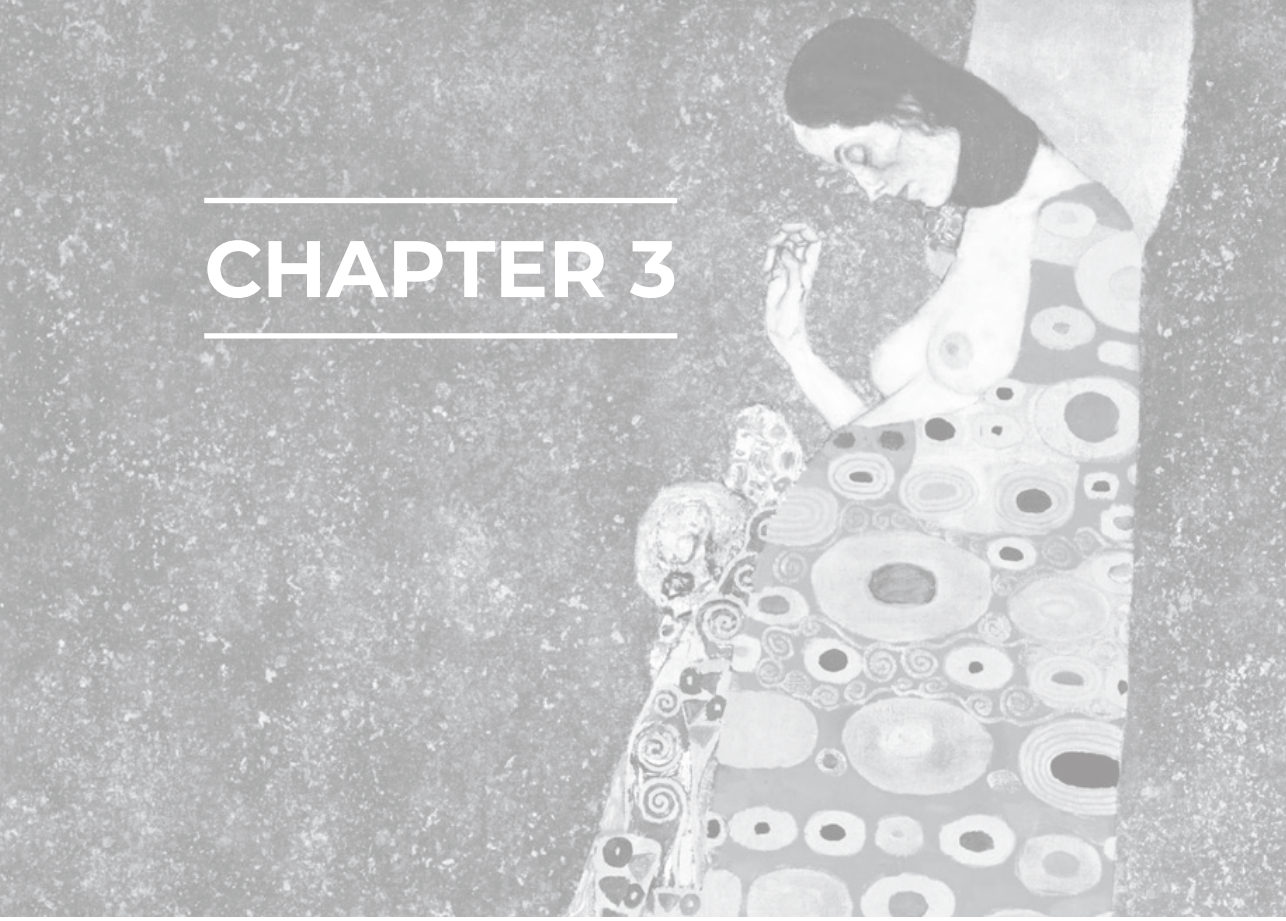
42. Central Bureau for Statistics (2020a). Bevolking op 1 januari; leeftijd, geboorteland en regio [Population on January 1st; age, country of birth and region].

43. Central Bureau of Statistics (CBS). Available at: https://opendata.cbs.nl/#/ CBS/nl/ dataset/70648ned/table?dl=6A628 Central Bureau for Statistics (2020b). Bevolking; onderwijsniveau; geslacht, leeftijd en migratieachtergrond [Population; educational level, sex, age and migration background] [Data file]. Central Bureau for Statistics (CBS). Available at: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82275NED/ table?dl=57DEE.

44. Salomonsson B, Gullberg MT, Alehagen S, Wijma, K. Self-efficacy beliefs and fear of childbirth in nulliparous women. J Psychosom Obstet Gynaecol. 2013 Sep;34(3):116–121. doi: 10.3109/0167482x.2013.824418 .

45. Ternström E, Hildingsson I, Haines H, Rubertsson C. Higher prevalence of childbirth related fear in foreign born pregnant women - - findings from a community sample in Sweden. Midwifery. 2015;31(4):445-50. doi: 10.1016/j.midw.2014.11.011.

46. Raisanen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. BJOG. 2014;121:965–970. doi: 10.1111/1471-0528.12599.



CHAPTER 3

Therapist perceptions of treating posttraumatic stress disorder in pregnancy: the VIP-study

Hendrix YMGA, Sier MAT, Baas MAM, van Pampus MG. Therapist perceptions of treating posttraumatic stress disorder in pregnancy: The VIP Study. J Trauma Stress. 2022 Oct;35(5):1420-31. doi: 10.1002/jts.22842.

ABSTRACT

There is no consensus on the treatment of posttraumatic stress disorder (PTSD) during pregnancy, and therapists' views on the matter are largely unknown. This cross-sectional study aimed to explore therapist beliefs and experiences regarding PTSD treatment during pregnancy.

Participants were therapists (N = 301) with experience treating PTSD who completed an online survey. The primary outcome measure was the percentage of therapists who were experienced in treating PTSD symptoms during pregnancy; secondary outcome measures assessed preferred treatments for the general and pregnant populations, perceived reluctance to treat PTSD in pregnancy, and perceived effects and adverse events attributed to treatment for pregnant women and fetuses.

The majority of participants (n = 246, 81.7%) had experience with treating PTSD during pregnancy. Eye movement desensitization and reprocessing was the preferred treatment for both the general and the pregnant populations. Almost half of the sample (48.8%) reported hearing that PTSD treatment in pregnancy could be harmful; 30.5% of therapists were reluctant to treat pregnant women with PTSD. Most therapists observed a clinically relevant posttreatment reduction of PTSD symptoms in pregnant women. Perceived adverse maternal and fetal events attributed to treatment were reported by 8.4% and 1.4% of therapists, respectively.

Despite reluctance, most therapists reported treating PTSD during pregnancy. The results show that although therapists often reported hearing that treating PTSD during pregnancy was harmful, only a small percentage reported perceived adverse events, and treatment was often viewed as effective. These findings implicate a more positive view on the treatment of PTSD in pregnancy

INTRODUCTION

Interest in mental health and psychiatric disorders during pregnancy, such as posttraumatic stress disorder (PTSD), has been rising. In their systematic review, Yildiz et al.[1] found a mean prevalence of PTSD in pregnancy of 3.3% in a community sample; this rate increased to almost 19% in high-risk samples, such as women with a previous history of abuse or childhood trauma, complicated pregnancies (e.g., early preeclampsia, preterm birth), or childbirth-related trauma (e.g., unplanned cesarean section). PTSD can develop, continue, or worsen during pregnancy. Complications during pregnancy and birth can lead to the development of PTSD postpartum, with risk factors such as preeclampsia, preterm birth, unplanned cesarean section, and a lack of support during the delivery linked to the presence of birth-related PTSD, which could, in turn, potentially influence subsequent pregnancies. In addition, potential triggers a woman encounters during pregnancy can lead to increased or continued symptoms of PTSD stemming from previous childbirth experiences or interpersonal violence (e.g., childhood sexual abuse, intimate partner violence[2-5]). Such triggers include the pregnancy itself[3], bodily changes, and vaginal exams[6]. Apart from PTSD itself, women often suffer from psychiatric comorbidities, such as depression, anxiety, and panic disorders[7,8].

Several studies on the impact of PTSD during pregnancy have reported adverse outcomes for both maternal and fetal health. The presence of preexisting PTSD in pregnancy may lead to obstetric complications, such as an increased risk of gestational diabetes and preeclampsia[9]. In addition, a higher risk of hyperemesis gravidarum has been found to be related to PTSD in pregnancy, with Seng et al.[10] proposing a trauma-related subtype of hyperemesis gravidarum that is distinguishable by high levels of dissociative symptoms. Furthermore, increased risks of preterm birth and lower birth weight, as well as a negative influence on mother–infant bonding, have been found[11-14]. PTSD in pregnancy is also related to postpartum depression, which, in turn, can negatively affect the mother–infant bond[15]. Thus, it is important to be aware of and attentive to the presence of PTSD in pregnancy.

For the general population, international and national practice guidelines recommend trauma-focused cognitive behavioral therapy (TF-CBT), including cognitive processing therapy and prolonged exposure, and eye movement desensitization and reprocessing (EMDR) as first-line therapies for PTSD[16-19]. PTSD treatment may cause shortterm arousal symptoms[20]; thus, therapists may be reluctant to start PTSD treatment during pregnancy due to a fear of posing a potential risk to maternal or fetal health[21]. Conversely, though, untreated PTSD in pregnancy may also impose a risk to maternal or fetal health, as noted[11-14]. Research on the treatment of PTSD during pregnancy is scarce, and recommendations vary across studies. A case report that included a pregnant woman with complex PTSD stemming from childhood sexual abuse found that although PTSD symptoms worsened initially during dialectical behavior therapy for PTSD (DBT-PTSD), which included exposure

therapy, they ultimately decreased and remained stable 6 months after the birth[22]. Furthermore, the course of the pregnancy did not appear to be affected by the treatment. A review on exposure-based CBT during pregnancy concluded that the treatment of anxiety disorders, including PTSD, is likely to be safe in pregnancy[23]. Moreover, a feasibility study on narrative exposure therapy (NET) that examined PTSD and depressive symptom reductions found promising results in a case series of eight pregnant women, with clinically significant reductions in PTSD and depressive symptoms in seven and eight women, respectively[24]. However, as the sample was small and there was no control group, these findings should be interpreted with caution. A systematic review by Baas et al.[25] focusing on the efficacy and safety of PTSD symptom treatment during pregnancy included 13 studies and found that, due to poor methodological quality, no conclusions could be drawn regarding the efficacy or safety of any particular treatment. Yet, the authors also found that PTSD symptoms were shown to improve in most studies, and no adverse events were reported[25]. In summary, although several studies have reported positive results, there is a significant lack of research focusing on PTSD treatment in pregnancy[24].

Due to the scarce literature on the efficacy and safety of PTSD treatment in pregnancy, clinical practice might differ between therapists. Therefore, the aim of this questionnaire study was to gain insight into treatment experiences by exploring therapists' views and perceptions (i.e., the VIP Study) toward PTSD treatment during pregnancy. As pregnancy is not a designated contraindication for certain types of PTSD treatments in national and international guidelines, we hypothesized that most therapists would have experience with treating PTSD during pregnancy. Second, we hypothesized that therapists' treatment choices would be the same for the general and pregnant populations. Furthermore, we evaluated the experiences of therapists who treated PTSD during pregnancy and observed the effects of the treatment. Because the existing literature on PTSD treatment during pregnancy, although scarce, has demonstrated overall symptom improvements and few adverse events[25], we hypothesized that the treatment of PTSD in pregnancy would be successful and that reported adverse events would be limited.

METHOD

Participants

A total of 301 therapists were included in the present analyses. Therapists were divided into two groups, characterized by experience treating PTSD in pregnancy (87.1%, n = 246) and no such experience (18.3%, n = 55; see Figure 1). The inclusion criteria were experience in treating PTSD and sufficient command of the Dutch language to answer the Dutch questionnaire. Therapists were excluded if they did not have experience treating PTSD. Because the questionnaire was sent to all therapists in the Netherlands who were members of their professional association, demographic characteristics such as age, gender, ethnicity, and socioeconomic status were not included in the survey, as they

would not contribute to the generalizability of the results; instead, the questionnaire included questions concerning years of professional experience, the total number of patients treated, and therapist profession or title (see Table 1).

Procedure

This study was an online cross-sectional survey study with a between-subjects design. Data were collected between January and April 2020. The questionnaire was distributed to Dutch therapists via social media platforms and various professional associations, including the National Centre of Excellence in Psychiatry and Pregnancy, Dutch institute for Psychologists, Dutch Society for Psychiatry, Dutch Association for Behavioral and Cognitive Therapies, Dutch Association for Psychological Trauma, and Dutch EMDR Association. The materials included information about the study and an anonymous (i.e., nontraceable) link to the online survey via Survey Monkey (San Mateo, CA, USA)

Measurements

The primary outcome measure was therapist experiences with the treatment of PTSD during pregnancy. Secondary outcome measures were preferred treatment for the general and pregnant populations, reluctance to treat PTSD in pregnancy, and observed perceived effects of and adverse events attributed to treatment on pregnant women and fetuses. A questionnaire was designed specifically for this research. The survey consisted of 22 questions, including 17 multiple-choice questions and five open-ended questions (5). The original Dutch questionnaire and the English translation are included in the Supplementary Materials.

Survey questions were subdivided into four topics: (a) professional characteristics (two questions), (b) therapists' experience of and vision regarding the treatment of PTSD in the general population (four questions), (c) therapists' vision of and experience with treating PTSD in the pregnant population (12 questions), and (d) outcomes following PTSD treatment during pregnancy (four questions). When therapists did not have experience treating PTSD during pregnancy, the questionnaire ended after a follow-up question regarding reasons for lack of experience. Two analysts experienced in designing questionnaires for research objectives reviewed the survey independently. The survey was piloted among a small group of psychology, psychiatry, and gynecology residents, as well as a gynecologist and psychiatrist for usability and validity, no substantial changes were made afterward. This study was exempted from ethical approval by the Medical Research Ethics Committees United (MEC-U) in Nieuwegein, the Netherlands on October, 18, 2019, and registered under number W19.197

Data analyses

Therapists were asked whether they had experience treating PTSD as well as PTSD during pregnancy ("yes" or "no"). To analyze potential differences in experience (years) and the number of treated patients between therapists with and without experience treating

PTSD in pregnancy, Mann–Whitney U tests were performed, as data were not normally distributed. To analyze potential differences in profession (e.g., clinical psychologist, residents, psychiatrists) between therapists with and without experience treating PTSD in pregnancy, a chi-square test was performed. Frequencies are presented as numbers and percentages for categorical variables; the median and interquartile range (IQR) are presented for continuous variables.

To measure differences in therapists' preferred PTSD treatment in the nonpregnant and pregnant populations, the frequencies of treatment choice in both populations were compared. In addition, we compared therapist treatment choice for both populations to see if this was equal between groups. Furthermore, therapists were asked, "In your opinion, what is the optimal time to start PTSD treatment during pregnancy?"; these results are presented as numbers and percentages.

To examine therapists' views on treatment during pregnancy, we asked the question. "Have you ever been taught or told that treatment of (symptoms of) PTSD would be harmful in pregnancy?" Response options included "no"; "yes, during my training"; "yes, from a colleague"; and "yes, somewhere else." Therapists were also asked, "Do you experience restraint in order to treat clients for (symptoms of) PTSD during pregnancy?" Responses were dichotomized as "yes" or "no." If a therapist answered "yes," they were asked why they experienced reluctance and were given a list of potential reasons from which to choose. Potential differences between therapists with and without experience treating PTSD in the pregnant population were analyzed using chi-square test or Fisher's exact tests. Finally, therapists without experience treating PTSD during pregnancy were asked, "What is the reason you did not treat clients for (symptoms of) PTSD during pregnancy?" Response options were divided into four categories (see the Supplementary Materials).

Observed effects of treatment were analyzed by asking therapists, "How large do you estimate the percentage of pregnant patients in which treatment of (symptoms of) PTS has led to a clinically relevant decrease of (symptoms of) PTSD?" Response options were divided into five categories ("0%," "1%–24%," "25%–49%"; "50%– 74%", and "75%–100%)." To measure therapists' views on perceived adverse events after treatment, they were asked, "Did you notice adverse effects in your pregnant client which, in your opinion, were caused by the PTSD treatment?" Responses were categorized as "yes" or "no"; if "yes," the therapist was asked follow-up questions on how many patients, which effects they noticed, and after which they noticed adverse effects (see Supplementary Materials). The same set of questions was then asked for perceived adverse events for the fetus. Additionally, therapists were asked, "Have you ever discontinued PTSD treatment prematurely during pregnancy?" If they answered "yes," they were asked for how many clients they discontinued treatment prematurely, after which intervention they discontinued treatment, and what their reasons were for discontinuing treatment.

Open-ended questions (e.g., "How many clients did you treat for [symptoms of] PTSD during pregnancy?," "On average, how many sessions did the treatment of PSTD consist of?") were analyzed as continuous variables. For some questions, one of the answer categories was openended (i.e., "other, please specify"), such as for type of therapist, treatment preference, reasons for treatment reluctance, and reasons for ending the treatment prematurely, as well as for reporting adverse events that, in their view, were caused by the treatment they provided. To categorize open-ended questions, general categories were created. For example, multiple therapists answered "psychotherapist" to the question "What is your profession?" Therefore, we coded every participant who gave this response into this category. For the open-ended questions "What is your preferred treatment for (symptoms of) PTSD in the general population/in pregnancy?," we identified categories based on response combinations and how often therapists gave the same answer. For example, a combination of EMDR and CBT was often named; therefore, a category reflecting this combination was created. Also, a combination of EMDR and another form of therapy (e.g., haptotherapy, imaginary rescripting) was often named; these responses were categorized as "EMDR + other." Responses that included the theme "depending on the client herself" were categorized as "preference of the client." Responses to open-ended questions were reviewed independently by two authors and were then categorized and coded accordingly. Mismatches in categories and coding were identified and discussed in detail with a third person. Responses to open-ended questions on profession and treatment choice that appeared fewer than five times were categorized as "other." We accounted for every response during the coding process.

Therapists were excluded if all data were missing (i.e., if only the informed consent was signed or if no follow-up questions were answered after therapists were divided into two groups according to experience treating PTSD during pregnancy). Data were thereafter analyzed per subheading or question so as not to limit the number of participants. The number of therapists who answered each specific question or subheading is mentioned in the text. Descriptive and statistical analyses were performed using SPSS (Version 24.0; IBM Corp., 2016)

RESULTS

Figure 1 depicts a flowchart of the included therapists. A total of 346 therapists agreed to participate in the study; of these therapists, 45 were excluded because of missing data (n = 39), a lack of experience treating PTSD (n = 5), and one duplicate survey, leaving 301 therapists in the present analyses. Therapists were divided into two groups according to whether they had experience treating PTSD during pregnancy. In the total sample, 246 (81.7%) therapists had experience treating PTSD in pregnancy; four of these therapists were excluded from further analyses due to missing data. Of the therapists without experience treating PTSD during pregnancy (n = 55, 18.3%), two were excluded due to missing data.

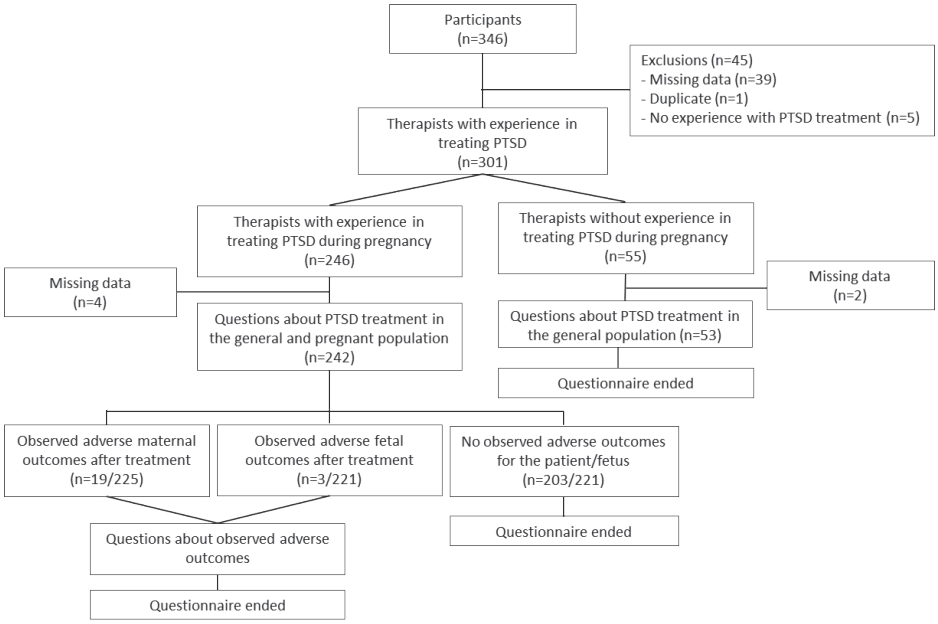


Figure 1. Flowchart of therapists, by treatment experience group. Note. Missing data indicate that no follow-up questions were answered thereafter. For the follow-up questions, the number of participants who answered a specific question or subquestion is presented.
PTSD=posttraumatic stress disorder.

Demographic characteristics for the total sample, stratified according to experience with PTSD treatment in pregnancy, are shown in Table 1. Therapists with experience treating PTSD in pregnancy reported a statistically significantly higher number of years of experience, U = 4,864.50, z = -3.262, p = .001, r = - .19, as well as a higher number of patients treated in the general population, U = 3,751.50, z = -5.186, p = .001, r = -.30 (see Table 1). These therapists treated a median of 5 (IQR: 2–10) women in pregnancy. No statistically significant difference in profession type was observed between therapists with and without experience treating PTSD in the pregnant population, $\chi 2(15, N = 301) = 8.36$, p = .908, V = .167. Among therapists without experience treating PTSD in the pregnant population, the main reasons for this lack of experience were a shortage of pregnant women suffering from PTSD (n = 46, 86.8%) and a decision to refrain from treatment due to pregnancy (n = 5, 9.4%). One participant (1.9%) indicated that it was 6 Hendrix et al. the woman's wish to refrain from treatment, and another participant (1.9%) did not provide a reason.

The most frequently used assessments to diagnose PTSD were the criteria specifications in the Diagnostic and Statistical Manual of Mental Disorder (fifth ed.; DSM-5 n = 154, 51.2%), clinical expertise (n = 41, 13.6%), and the Clinician Administered PTSD Scale for the DSM-5 (CAPS-5; n = 49, 16.3%). In the general (i.e., nonpregnant) population, most therapists (n = 234, 77.7%) preferred EMDR for treating PTSD. Therapists also preferred combinations

of EMDR and CBT (n = 18.6%); EMDR and another form of therapy (i.e. NET, medication, or imagery rescripting; n = 20, 6.7%); standalone CBT (n = 8, 2.7%); and other forms of therapy (i.e., fewer than five endorsing therapists per therapy), including imagery rescripting, NET, writing therapy, psychotherapy, and others (n = 16, 5.4%). Five participants (1.7%) indicated that they made an individual choice depending on the patient's wishes.

Table 1 . Sociodemographic characteristics of the sample

	Total Sample	**Experience with PTSD treatment in pregnancy**		
	***n*=301**	**Yes (*n*=246, 81.7%)**	**No (*n*=55, 18.3%)**	
	Median (IQR)	*Median (IQR)*	*Median (IQR)*	*p*-value
Years of experience, median (IQR)	12 (8-20)	13 (9-20)	9 (5-15)	0.001
Number of treated patients general population, median (IQR)	80 (30-200)	100 (40-200)	30 (15-50)	0.001
Profession, n (%)				0.908
Healthcare psychologist	137 (45.5)	112 (45.5)	25(45.5)	
Clinical psychologist	48 (15.9)	40 (16.3)	8 (14.5)	
General psychologist	28 (9.3)	20(8.1)	8 (14.5)	
Resident in healthcare psychology	21 (7.0)	16 (6.5)	5 (9.1)	
Resident in clinical psychology	14 (4.7)	12 (4.9)	2 (3.6)	
Psychiatrist	11 (3.7)	9 (3.7)	2 (3.6)	
Psychotherapist	9 (3.0)	9 (3.7)	0 (0)	
Nurse practitioner	5 (1.7)	5 (2.0)	0 (0)	
Other *	28 (9.3)	23 (9.3)	5 (9.1)	

**Other is defined as professions with less than five participants*

Reluctance to treat PTSD in the pregnant population

The subsequent questions were answered by 295 (98.0%) therapists. Almost half of these therapists (n = 144, 48.8%) were taught or told that treating PTSD during pregnancy would be harmful. This percentage did not significantly differ between groups, with 51.2% versus 37.7% of therapists who did or did not have experience treating PTSD in the pregnant population, respectively, endorsing this item, $\chi 2(1, N = 295) = 3.17$, $p = .075$, $V = .104$. Therapists noted that they were told about the potential harm caused by treating PTSD in pregnancy during training (11.5%), by a colleague (19.0%), or elsewhere (18.3%; Table 2).

Reluctance to start PTSD treatment during pregnancy was reported by 90 (30.5%) therapists, with no statistically significant differences between therapists with and without

experience treating PTSD in pregnant women. The most frequently reported reason for reluctance was the expected harmful effects of treatment on the fetus; the reasons for reluctance also did not statistically significantly differ across groups (see Table 2).

Table 2. *Expected harmfulness and experienced reluctance for posttraumatic stress disorder (PTSD) during pregnancy, by experience group.*

	Total Sample	**Experience with PTSD treatment in pregnancy**		
	(*n*=295)	**No (*n*=53)**	**Yes (*n*=242)**	***p*-value**
Heard PTSD treatment is harmful during pregnancy.	144 (48.8)	20 (37.7)	124 (51.2)	0.075
Heard during training	34 (11.5)	4 (7.5)	30 (12.4)	
Heard from a colleague	56 (19)	10 (18.9)	46 (19.0)	
Heard elsewhere	54 (18.3)	6 (11.3)	48 (19.8)	
Experiencing reluctance to treat PTSD during pregnancy	90 (30.5)	17 (32.1)	73 (30.2)	0.784
Reasons for reluctance				
Expected adverse effect for the fetus	59 (65.6)	12 (70.6)	47 (64.4)	0.785
Expected adverse psychological effect	49 (54.4)	10 (58.8)	39 (53.4)	0.864
Expected adverse physical effect	41 (45.6)	8 (47.0)	33 (45.2)	0.955
Preference of the pregnant woman	39 (43.3)	10 (58.8)	29 (39.7)	0.213
Therapy interfering behavior	34 (37.8)	4 (23.5)	30 (41.1)	0.132
Therapists personal preference	22 (24.4)	3 (17.6)	19 (26.0)	0.403
Expectancy that treatment will be unsuccessful during pregnancy	10 (11.1)	2 (11.8)	8 (11.0)	0.984

Treatment of PTSD in pregnancy

Within the group of therapists who reported experience treating PTSD during pregnancy, further questions on treatment were answered by 232 (95.6%) therapists. Over three quarters (n = 182, 78.4%) of these individuals reported that treatment was preferably started as soon as possible after client registration, with a median of six sessions (IQR: 4–10 sessions) required to complete treatment. Regarding chosen treatment type, 186 (80.1%) therapists indicated that they would use the same PTSD treatment in the general and pregnant populations, with 76.3% preferring EMDR therapy. Therapists also reported opting to use a combination of EMDR and another form of therapy (i.e., medication or imagery rescripting; n = 10, 4.3%); a combination of EMDR and CBT (n = 8, 3.4%); an intervention based on the patient's preferences (n = 7, 3.0%); or another form of therapy, including CBT, NET, psychotherapy, imagery rescripting, and others (n = 16, 5.1%). Eight therapists (3.4%) responded that their readiness to treat PTSD during pregnancy was related to trauma type: When PTSD was "related to a previous birth experience," therapists preferred to treat PTSD during pregnancy, whereas when symptoms were "related to

a different traumatic event or childhood," they would opt to postpone treatment. Four therapists (1.7%) said they would "postpone treatment until after gestation."

Premature discontinuation of PTSD treatment during pregnancy was reported by 67 (28.8%) therapists, in a median of one woman (IQR: 1–2 women) out of a median of five pregnant patients (IQR: 3–20 pregnant patients) treated during pregnancy. The main reasons for treatment discontinuation were the preference of the pregnant women themselves and reported adverse psychological or physical effects attributed to treatment (see Table 3).

Table 3. Reasons for discontinuation of posttraumatic stress disorder (PTSD) treatment during pregnancy)

Reasons for discontinuation	**Premature discontinuation** *n*=**67 (28.8%)**	
	n	**%**
Preference of the pregnant woman	29	(43.3)
Psychological effect of treatment on pregnant woman	14	(20.9)
Physical effect of treatment on pregnant woman	8	(11.9)
Physical constraints	7	(10.4)
No effect of treatment	5	(7.5)
Fear of preterm birth	4	(6)
Giving birth	4	(6)
Adverse effect on fetus	4	(6)
Psychological problems not attributed to treatment	4	(6)
Receiving treatment elsewhere	3	(4.5)
Missing	3	(4.5)
Medical doctor advised against treatment	2	(3)
Concerns regarding nonspecified pregnancy complications in pregnancy	2	(3)
Logistical reasons	1	(1.5)
Psychosocial problems beyond PTSD	1	(1.5)

Note. Therapists could state multiple reasons for discontinuing treatment.

Perceived symptoms reduction and adverse events following PTSD treatment during pregnancy

Data on the effects of treatment were collected from 225 (93.0%) therapists. Most therapists (n = 137, 60.9%) reported a clinically relevant reduction of PTSD symptoms in more than 75% of the pregnant women they treated, followed by 60 therapists (26.7%) who estimated clinically significant reductions in 50%–74 % of pregnant patients. In total, 197 (87.6%) therapists reported a clinically relevant reduction of PTSD symptoms in more than 50% of the treated women, with 60.9% reporting a reduction in 75%–100% of women.

Perceived adverse maternal events ascribed to PTSD treatment were observed by 19 therapists (8.4%); three of these therapists did not specify the perceived adverse event or therapy. The most commonly reported adverse events were an increase in PTSD symptoms, such as reexperiencing (n = 9, 47.4%) and arousal (n = 6, 31.6%) symptoms. Therapists also reported high blood pressure (n = 3, 15.8%) and increases in stress (n = 2, 10.5%), fear of childbirth (n = 1, 5.3%), and depressive symptoms (n = 1, 5.3%) as adverse events they attributed to treatment. These perceived adverse events were reported in a median of two women (IQR: 1–4 women) and were documented after EMDR (n = 10, 52.6%), combined treatments (n = 4, 21.1%), and CBT (n = 3, 15.8%). Therapist-perceived adverse fetal events ascribed to treatment were reported by three out of 221 (1.4%) participants, two of whom reported specific events and treatment type (Table 4). Perceived adverse events included preterm birth, low birth weight, tachycardia, and agitation after birth. These therapist-perceived adverse fetal events were reported after pharmacological therapy, such as selective serotonin reuptake inhibitors and tricyclic antidepressants (n = 1), and haptotherapy (n = 1).

Table 4. Reported outcomes for the woman and fetus after posttraumatic stress disorder (PTSD) treatment during pregnancy

Variable	n	(%)
Estimated percentage of women with clinically relevant reduction of PTSD symptoms		
0%	3	(1.3)
1-24%	4 (1.8)	(1.8)
25-49%	21 (9.3)	(9.3)
50-74%	60 (26.7)	(26.7)
75-100%	137 (60.9)	(60.9)
Reported adverse outcomes in women [1]	19 (8.4)	(8.4)
Increase in re-experiencing	9 (47.4)	(47.4)
Increase in arousal	6 (31.6)	(31.6)
Increase in avoidance	5 (26.3)	(26.3)
Increase in negative thoughts	4 (21.1)	(21.1)
High blood pressure	3 (15.8)	(15.8)
Increase in stress	2 (10.5)	(10.5)
Increase in fear of childbirth	1 (5.3)	(5.3)
Increase depression	1 (5.3)	(5.3)
Missing	3 (15.8)	(15.8)
Reported adverse fetal outcomes [a]	3/221 (1.4%)	(1.4%)
Preterm birth	1 (33.3%)	(33.3%)
Low birthweight	1 (33.3%)	(33.3%)
Tachycardia	1 (33.3%)	(33.3%)
Agitation after birth	1 (33.3%)	(33.3%)
Missing	1 (33.3%)	(33.3%)

Note: N=225. For reported fetal and maternal adverse events, therapists could choose multiple answers. It is unknown whether the given answers represented different women or fetusus.
[a] n=221.

DISCUSSION

To our knowledge, this was the first questionnaire study to explore the perceptions of therapists regarding the treatment of PTSD during pregnancy. Most therapists indicated they had experience treating PTSD in pregnancy. The main reason for a lack of experience was due to the absence of pregnant women with PTSD symptoms, was reflected in the statistically significant lower number of years of experience and treated patients. This implies that most therapists are receptive to treating PTSD during pregnancy, although a minority of participants declined to treat because of pregnancy.

In both the general and pregnant populations, EMDR was the first-choice treatment. Even though national and international guidelines state that both EMDR and trauma-focused CBT are first-line therapies[26-28] few therapists reported using CBT. A possible explanation for the pronounced preference for EMDR is that the therapy involves little homework[29] and may require fewer therapy sessions than CBT[30]. In recent years, EMDR has also become well-established and is included in international guidelines, which, as noted, have added EMDR as a first-line treatment. However, a sampling bias may also have occurred, as the survey was sent to all professional associations in the Netherlands, including the Dutch EMDR Association. Because we did not measure the response rate per association, it is possible that the Dutch EMDR Association was overrepresented in this sample, contributing to the preference for EMDR among the surveyed therapists. However, this may only partially explain the outspoken preference for EMDR therapy; among participants who did not choose EMDR as their preferred standalone intervention, many indicated using a combination of EMDR plus CBT or another form of therapy as their preferred treatment, which implies the widespread use of EMDR for the treatment of PTSD.

Interestingly, almost half of the therapists (48.8%) in the present sample reported being taught or told that the treatment of PTSD during pregnancy could be harmful. This percentage was not statistically significantly different for therapists with or without experience in treatment in pregnancy. This suggests that having heard that treatment could be harmful in pregnancy was not a limiting factor for starting PTSD treatment in pregnancy. Furthermore, because therapists with fewer years of experience were also less often informed about possible negative effects, these results might reflect a current change in insight and a more positive view toward the treatment of PTSD in pregnancy. This finding could also explain why therapists treated pregnant women despite being informed about the potential harmful effects. Nonetheless, this raises questions about the information that educators and colleagues provide regarding PTSD treatment during pregnancy. Until recently, there was no scientific foundation regarding the safety of treatment of PTSD during pregnancy; however, a systematic review by Baas et al.[25] suggests treatment is likely safe, yet the number of relevant studies is still scarce.

Approximately one in three therapists reported a reluctance to treat PSTD during pregnancy; this was the same among therapists both with and without previous experience treating PTSD in the pregnant population. This reluctance was frequently due to the expectation of negative effects for the fetus or adverse psychological and physical effects for the pregnant woman following treatment. However, in the present study, the number of therapists who reported reluctance to treat PTSD during pregnancy due to the prospect of adverse effects for mother or fetus was substantially higher than the reported rate of perceived adverse events: Adverse events were only reported by 19 (8.4%) therapists for the mother and three (1.4%) therapists for the fetus. An awareness of this discrepancy may decrease the rate of reticence to treat pregnant women for PTSD.

It is important to note that the reported perceived adverse events for both pregnant women and their fetuses must be interpreted with caution. Inherent to the methods of this survey study, a causal relation cannot be established, as this was not an intervention study conducted in a sample of pregnant women with PTSD that included randomization and a control group. For example, three therapists reported hypertension as an adverse event following treatment. Other studies, however, have shown that during pregnancy, the presence of PTSD itself is a risk factor for hypertension[9] and that treating PTSD can reduce the risk of hypertension in nonpregnant populations[31,32.] In this study, preterm birth and low birth weight were reported by a therapist as perceived adverse events attributed to treatment with haptotherapy. Haptotherapy, a person-centered therapy focusing on restoring the mind– body connection, involves affective touch from the therapist to help the patient with emotional processing[33]. There is no current literature on the effect of haptotherapy as a standalone treatment for PTSD in the general population or among pregnant women; therefore, it is not a recommended treatment for PTSD. However, in a randomized controlled trial (RCT) by Klabbers et al.[34] on the effect of haptotherapy on the fear of childbirth in pregnant women, considered an anxiety disorder, haptotherapy was found to decrease the fear of childbirth, as well as distress and depressive symptoms, and no negative side effects with regard to birth weight, pregnancy duration, or gestational age were observed. Moreover, previous findings have indicated that the presence of untreated PTSD during pregnancy is related to adverse outcomes for both maternal and fetal health, such as growth restriction and preterm birth[11-15]. Although treatment aimed at PTSD symptom reduction may, hopefully, also reduce the risk of adverse fetomaternal events, these can still occur. It is, thereby, important to note that refraining from treatment is more likely to be harmful than treating PTSD[11-14]. Some therapists in the present sample reported an increase in PTSD symptoms as a perceived adverse event; as such, these individuals might choose to withhold treatment in fear of posing a risk to their pregnant client. However, such symptom exacerbations are often short-lived and followed by a significant improvement in symptoms[20,35] and, thus, may be incorrectly viewed as adverse events. Moreover, it is known that pregnancy can increase stress levels, and symptoms of depression and can induce a fear of childbirth. It is plausible, therefore, that these perceived adverse events are not related to PTSD treatment, and a perceived increase in stress, depression, and fear of childbirth may even be mitigated by treatment.

Importantly, most therapists in the present sample observed a clinically relevant reduction in PTSD symptoms in more than 50% of the pregnant women they treated, suggesting that treatment in pregnancy is often successful. This is in line with published studies exploring the effectiveness of various interventions, including psychoeducation, CBT, and EMDR, during pregnancy[22-25]. Treatment discontinuation (28.8%) was most often initiated by the pregnant client herself; less frequently, it was a consequence of adverse psychological or physical effects attributed to treatment. In their systematic review, Lewis and colleagues[36] found a mean dropout rate of 18% for trauma-focused RCTs on psychological therapies for PTSD, although there was significant heterogeneity between studies (i.e., 0%–65%). This discrepancy in drop-out rates might reflect the review's focus on RCTs as opposed to a community sample of therapists, as was recruited for the present study.

Therapists who treat PTSD and see pregnant patients should be informed about the potential risks of untreated PTSD in pregnancy and notified that there is little research on the efficacy of treatment in pregnancy. Specifically, there is no empirical support for the notion that significantly more adverse events are associated with treating PTSD in pregnant women compared with nonpregnant patients, as very few adverse events have been reported in the literature[25]. It is important to emphasize that this was a survey study that aimed to identify the opinions and views of therapists themselves on treatment that they have provided as well as the perceived beneficial or adverse effects. Therefore, no definite conclusions can be drawn regarding the efficacy and safety of treating PTSD in the pregnant population. However, overall, therapists reported positive results, and we observed a discrepancy between expected and reported attributed adverse effects by the therapists in favor of perinatal PTSD treatment. Well-informed therapists may treat PSTD during pregnancy with less reluctance, thereby enhancing support for the research and the development of evidence based perinatal PTSD treatments.

One of the strengths of the present study is that it was the first study of which we are aware to explore the perceptions of therapists regarding PTSD treatment during pregnancy, giving the field insight into therapists' daily practice. Furthermore, the questionnaire was available for all therapists affiliated with a professional organization in the Netherlands and was easily accessible. The study population included individuals in various professions, resulting in a representative study sample and good generalizability. The relatively small sample size (N = 301) represents an important limitation of the study. The response rate was fairly low even though the survey was brought to the attention of all Dutch therapists through professional associations and social media platforms. Furthermore, as stated, a sampling bias may have occurred, as we did not measure the number of respondents from each professional association. In addition, a self-selection bias could have occurred, as this was a web-based survey, and participants with an interest in treatment in pregnancy may have been more inclined to participate. Another limitation is that the perceived reduction in PTSD symptoms and perceived maternal and fetal adverse reflect the opinion of the therapist; thus, these results must be interpreted

with caution. However, the data demonstrate how therapists think about treatment in pregnancy, representing important findings that, hopefully, will lead to discussion and help initiate further research on treatment in pregnancy.

Future research should focus on expanding the field's understanding of PTSD treatment during pregnancy as well as clarifying the short- and long-term maternal and fetal effects of treating PTSD during pregnancy. It would be interesting to look at the cost-effectiveness of such treatments, as research has shown the negative pre- and perinatal effects of PTSD itself. Currently, an RCT is being conducted by Baas et al.[37] studying the effectiveness and safety of EMDR treatment during pregnancy for fear of childbirth. In addition, researchers should explore pregnant women's perceptions of PTSD treatment during pregnancy to obtain information about their willingness to start PTSD treatment while pregnant.

In conclusion, the present study contributes to a better understanding of the views of therapists who treat PTSD and provides insight into the clinical practice. The findings suggest that although most therapists treat PTSD in pregnancy, many are still reluctant to treat pregnant women for the disorder. The second major finding was that although therapists experience reluctance to treat PTSD during pregnancy and report being told that such treatment can cause harmful maternal and fetal effects, perinatal PTSD treatment is generally reported to be successful, and the number of reported adverse maternal and fetal events is low. Moreover, it is unclear whether the reported adverse events can be attributed to treatment and, even if they can, adverse effects may not be worse in pregnant versus nonpregnant patients and may not be more dangerous during pregnancy. It is important that therapists receive training on this subject based on the available evidence. Further research is needed to provide effective and safe evidence-based treatments for pregnant women. Additionally, practitioners should be encouraged to exchange information and relay experiences regarding treating PTSD in pregnant women.

REFERENCES

1. Yildiz, PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. J Affect Disord. 2017 Jan;208:634-645. doi: 10.1016/j.jad.2016.10.009.
2. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016;46(6):1121-34. doi: 10.1017/s0033291715002706.
3. Beck CT, Watson S. Subsequent childbirth after a previous traumatic birth. Nurs Res 2010;59(4): 241-9. doi: 10.1097/NNR.0b013e3181e501fd.
4. Bruce SE, Weisberg RB, Dolan RT Machan, JT, Kessler RC, Manchester G, Culpepper L, Keller M.B. Trauma and Posttraumatic Stress Disorder in Primary Care Patients. Prim Care Companion J Clin Psychiatry. 2001;3(5):211-17. doi: 10.4088/pcc.v03n0504.
5. Soderquist J, Wijma B, Thorbert,G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. BJOG. 2009;116(5):672-680. doi: 10.1111/j.1471-0528.2008.02083.x.
6. Leeners B, Richter-Appelt H Imthurn B, Rath W. Influence of childhood sexual abuse on pregnancy, delivery, and the early postpartum period in adult women. J Psychosom Res. 2006;61(2):139-51. doi: 10.1016/j.jpsychores.2005. 11.006.
7. Loveland Cook CA, Flick LH, Homan SM, Campbell C, McSweeney M, Gallagher ME. Posttraumatic stress disorder in pregnancy: Prevalence, risk factors, and treatment. Obstet Gynecol. 2004;103(4):710–717. doi.org/10.1097/ 01.AOG.0000119222.40241.fb.
8. Smith MV, Poschman K, Cavaleri MA, Howell HB, Yonkers KA. Symptoms of posttraumatic stress disorder in a community sample of low-income pregnant women. Am J Psychiatry. 2006;163(5):881–4. doi: 10.1176/ajp. 2006.163.5.881.
9. Shaw JG, Asch SM, Katon JG, Shaw KA, Kimerling R, Frayne SM, Phibbs CS. Post-traumatic Stress Disorder and Antepartum Complications: a Novel Risk Factor for Gestational Diabetes and Preeclampsia. Paediatr Perinat Epidemiol. 2017;31(3):185-194. doi: 10.1111/ppe.12349.
10. Seng J, Miller J, Sperlich,M, van de Ven CJ, Brown S, Carter CS, Liberzon I. Exploring dissociation and oxytocin as pathways between trauma exposure and trauma-related hyperemesis gravidarum: A test-of-concept pilot. Journal Trauma Dissociation. 2013;14(1):40–55. doi: 10.1080/15299732.2012. 694594.
11. Cook N, Ayers S, Horsch A. Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. J Affect Disord. 2018;225:18-31. doi: 10.1016/j.jad.2017.07.045.
12. Shapiro GD, Fraser WD, Frasch MG, Séguin JR. Psychosocial stress in pregnancy and preterm birth: associations and mechanisms. J Perinat Med. 2013;41(6):631-645. doi: 10.1515/jpm-2012-0295.
13. Shaw JG, Asch SM, Kimerling R, Frayne SM, Shaw KA, Phibbs CS. Posttraumatic stress disorder and risk of spontaneous preterm birth. Obstet Gynecol. 2014;124(6):1111-9. doi: 10.1097/aog.0000000000000542.
14. Yonkers KA, Smith MV, Forray A, Epperson CN, Costello D, Lin H, et al. Pregnant women with posttraumatic stress disorder and risk of preterm birth. JAMA Psychiatry. 2014;71(8):897-904. doi.org/10.1001/jamapsychiatry.2014.558.

15. Muzik M, McGinnis EW, Bocknek E, Morelen D, Rosenblum KL, Liberzon I Seng, J, Abelson JL. PTSD symptoms across pregnancy and early postpartum among women with lifetime PTSD diagnosis. Depress Anxiety. 2016;33(7):584–591. doi: 10.1002/da.22465.

16. Bisson JI, Roberts NP Andrew, M, Cooper R, Lewis C. Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. Cochrane Database Syst Rev. 2013(12), Cd003388. doi: 10.1002/14651858.CD003388.pub4.

17. Courtois C, Sonis J, Brown L, Cook J, Fairbank J, Friedman M, Schulz P. Clinical practice guideline for the treatment of posttraumatic stress disorder (PTSD) in adults. 2017. American Psychological Association.

18. National Institute for Health and Care Excellence. (2018). Post-traumatic stress disorder. www.nice.org.uk/guidance/ng116

19. Trimbos-instituut. (2013). Multidisciplinaire richtlijn Angststoornissen (Derde revisie). Richtlijn voor de diagnostiek, behandeling en begeleiding van volwassen patiënten met een angststoornis. Trimbos-instituut. www.ggzrichtlijnen.nl

20. Shapiro F. (2017). Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures. Guilford Publications.

21. Forgash C, Leeds A, Stramrood CAI, Robbins A. Case consultation: Traumatized pregnant woman. J EMDR Pract Res. 2013;7(1):45-9.

22. Becker-Sadzio J, Gundel F, Kroczek A, Wekenmann S, Rapp A, Fallgatter AJ, Deppermann S. Trauma exposure therapy in a pregnant woman suffering from complex posttraumatic stress disorder after childhood sexual abuse: Risk or benefit? Eur J Psychotraumatol. 2020;11(1):1697581. doi: 10.1080/20008198.2019.1697581.

23. Arch JJ, Dimidjian S, Chessick C. Are exposure-based cognitive behavioral therapies safe during pregnancy? Arch Womens Ment Health. 2012;15(6):445-457. doi: 10.1007/s00737-012-0308-9.

24. Stevens NR, Miller ML, Puetz AK, Padin AC, Adams N, Meyer DJ. Psychological intervention and treatment for posttraumatic stress disorder during pregnancy: A systematic review and call to action. J Trauma Stress. 2021;34(3):575-85. doi: 10.1002/jts.22641.

25. Baas MAM, van Pampus MG, Braam L, Stramrood CAI, de Jongh A. The effects of PTSD treatment during pregnancy: systematic review and case study. Eur J Psychotraumatol. 2020;11(1):1762310. doi: 10.1080/20008198.2020.1762310.

26. National Institute for Health and Care Excellence. (2018). Posttraumatic stress disorder. www.nice.org.uk/guidance/ng

27. World Health Organization. (2013). Guidelines for the management of conditions that are specifically related to stress. World Health Organization.

28. Trimbos-Instituut. (2013). Multidisciplinaire richtlijn Angststoornissen (Derde revisie). Richtlijn voor de diagnostiek, behandeling en begeleiding van volwassen patiënten met een angststoornis. [Multidisciplinary guideline for anxiety disorders (3rd rev.).Guideline for the diagnostics, treatment and guidance of adult patients with a anxiety disorder. Trimbos-institute/ Trimbos-instituut. www. ggzrichtlijnen.nl

29. Ho MSK, Lee C (2012). Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder–is it all in the homework then? Eur Review Applied Psychology. 2012;62(4):253-60.

30. de Jongh A, Amann BL, Hofmann A, Farrell D, Lee CW. The status of EMDR therapy in the treatment of posttraumatic stress disorder 30 years after its introduction. J EMDR Practice and Research. 2019;13(4), 261-269.

31. Bourassa KJ Hendrickson RC, Reger GM, Norr, AM. Posttraumatic Stress Disorder Treatment Effects on Cardiovascular Physiology: A Systematic Review and Agenda for Future Research. J Trauma Stress. 2021;34(2):384-93. doi: 10.1002/jts.22637.

32. Burg MM, Brandt C, Buta E, Schwartz J, Bathulapalli H, Dziura J, et al. Risk for Incident Hypertension Associated With Posttraumatic Stress Disorder in Military Veterans and the Effect of Posttraumatic Stress Disorder Treatment. Psychosom Medicine. 2017;79(2):181-8. doi: 10.1097/PSY.0000000000000376.

33. Plooij, E. (2015). Haptotherapie: Praktijk en theorie. [Haptotherapy: Practice and theory] Pearson Benelux B.V.

34. Klabbers GA, Wijma K, Paarlberg KM, Emons WHM, Vingerhoets A. Haptotherapy as a new intervention for treating fear of childbirth: a randomized controlled trial. J Psychosom Obstet Gynaecol. 2019;40(1):38-47. doi: 10.1080/0167482x.2017.1398230.

35. Larsen SE, Wiltsey Stirman S Smith, BN, Resick PA. Symptom exacerbations in trauma-focused treatments: Associations with treatment outcome and non-completion. Behav Res Ther. 2016;77:68–77. Doi: 10.1016/j.brat. 2015.12.009.

36. Lewis C, Roberts NP, Gibson S, Bisson JI. Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: systematic review and meta-analysis. Eur J Psychotraumatol. 2020;11(1):1709709. doi: 10.1080/20008198.2019.1709709.

37. Baas M, Stramrood C, Dijksman L, de Jongh A, van Pampus MG. The OptiMUM-study: EMDR therapy in pregnant women with posttraumatic stress disorder after previous childbirth and pregnant women with fear of childbirth: design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1):1293315. doi: 10.1080/20008198.2017.1293315.

CHAPTER 4

The effects of PTSD treatment during pregnancy: systematic review and case study

Baas MAM, van Pampus MG, Braam LS, Stramrood CAI, de Jongh A. The effects of PTSD treatment during pregnancy: systematic review and case study. Eur J Psychotraumatol. 2020;11(1):1762310, doi: 10.1080/20008198.2020.1762310.

ABSTRACT

Background

PTSD in pregnant women is associated with adverse outcomes for mothers and their children. It is unknown whether pregnant women with PTSD, or symptoms of PTSD, can receive targeted treatment that is safe and effective. Objective: The purpose of the present paper was to assess the effectiveness and safety of treatment for (symptoms of) PTSD in pregnant women.

Method

A systematic review was conducted in accordance with the PRISMA guidelines in Pubmed, Embase, PsychINFO, and Cochrane. In addition, a case is presented of a pregnant woman with PTSD who received eye-movement desensitization and reprocessing (EMDR) therapy aimed at processing the memories of a previous distressing childbirth.

Results

In total, 13 studies were included, involving eight types of interventions (i.e. trauma-focused cognitive behavioural therapy, exposure therapy, EMDR therapy, interpersonal psychotherapy, explorative therapy, self-hypnosis and relaxation, Survivor Moms Companion, and Seeking Safety Intervention). In three studies, the traumatic event pertained to a previous childbirth. Five studies reported obstetrical outcomes. After requesting additional information, authors of five studies indicated an absence of serious adverse events. PTSD symptoms improved in 10 studies. However, most studies carried a high risk of bias. In our case study, a pregnant woman with a PTSD diagnosis based on DSM-5 no longer fulfilled the criteria of PTSD after three sessions of EMDR therapy. She had an uncomplicated pregnancy and delivery.

Conclusion

Despite the fact that case studies as the one presented here report no adverse events, and treatment is likely safe, due to the poor methodological quality of most studies it is impossible to allow inferences on the effects of any particular treatment of PTSD (symptoms) during pregnancy. Yet, given the elevated maternal stress and cortisol levels in pregnant women with PTSD, and the fact that so far no adverse effects on the unborn child have been reported associated with the application of trauma-focused therapy, treatment of PTSD during pregnancy is most likely safe.

INTRODUCTION

Although pregnancy and childbirth are generally considered to be positive life events, 10-20% of women experience birth as a traumatic event[1–5]. It is estimated that 3% of women develop posttraumatic stress disorder (PTSD) following childbirth[6,7], albeit in at-risk groups the proportion of individuals who develop PTSD is much higher (15.7%;[7]). However, women may also be exposed to other, unrelated, traumatic events prior to pregnancy. For example, there is evidence to suggest that in community samples the prevalence of PTSD during pregnancy is about 3%, and that in high-risk groups almost 20% of pregnant women suffer from PTSD[8]. PTSD symptoms may continue into subsequent pregnancies if they are not diagnosed and treated adequately[9], and may even increase in severity[10]. This is important, because experiencing posttraumatic stress during pregnancy has been associated with negative maternal and fetal outcomes, such as low birth-weight[11].

There are several diagnostic challenges regarding PTSD after childbirth that make it difficult to timely initiate adequate treatment. The core features of PTSD are re-experiencing, avoidance and numbing, negative cognitions and mood, and hyperarousal[12]. In the postpartum period, for both patient, partner and medical professional it may be difficult to differentiate posttraumatic stress symptoms from physiological characteristics of the maternity period, including recurrent thoughts of the delivery, sleeping problems, concentration difficulties, emotional dysregulation, irritability and hypervigilance[13]. Symptoms of PTSD could also easily be mistaken for postpartum depression, since both PTSD and depression may include negative mood and cognitions. The prevalence of childbirth-related PTSD is higher when pregnancy or childbirth are complicated[6]. However, it is important to emphasize that symptoms of PTSD may also occur after uneventful deliveries, which makes it even more difficult to be recognized and detected. Lastly, the core PTSD feature avoidance may result in avoiding conversations about the childbirth, or cancellation of appointments with professionals, thereby complicating adequate assessment of PTSD symptoms. Conceivably, avoidance symptoms may lead to terminating the pregnancy, or demanding a planned caesarean, whereas it also has been observed that in a subsequent pregnancy, pregnant women avoid prenatal care[14].

While there are a number of first choice trauma-focused psychotherapeutic interventions for treating symptoms of PTSD available (National Institute for Health and Clinical Excellence, 2018), unfortunately, pregnant women are often excluded or severely underrepresented in clinical research[16]. Consequently, there is a lack of evidence about the effectiveness and potential risks of treating PTSD (symptoms) during pregnancy. Clearly, in PTSD, trauma memories are related to psychological and physiological distress, and trauma-focused therapies include processing the trauma memories. Because it can't be ruled out that this short-term arousal is harmful for the unborn child, patients and professionals are reluctant to start therapy for symptoms of PTSD[17] which is likely to lead to postponing psychological treatment until after childbirth. Conversely, untreated PTSD equals a continuous amount of

psychological distress, and an elevated level of stress hormones (e.g., cortisol), which may lead to complications later in life[18,19]. To this end, it is unknown whether we might do more harm by treating a pregnant woman while she suffers from PTSD than withholding pregnant women an evidence-based treatment (e.g., PE, CBT, EMDR therapy) for symptoms of PTSD.

The purpose of the present paper was to conduct a systematic review to assess the effects of applying both trauma-focused and non-trauma-focused therapies for PTSD symptoms in pregnant women. Therapies were considered trauma-focused in case they are psychotherapies for PTSD involving direct discussion of the traumatic event. Examples are EMDR therapy, prolonged exposure, cognitive restructuring aimed at trauma-related beliefs, and other therapeutic procedures such as written autobiographical narratives, and hypnosis. Because it is difficult to evaluate the effects of different trauma histories we were interested in the effects of these therapies on women with PTSD in general; that is, women with childbirth related PTSD and/or PTSD from any trauma. More specifically, we aimed to determine the effectiveness and safety (both psychological as obstetric outcomes) of therapy for these PTSD symptoms during pregnancy. In addition, given the lack of studies on the effects of trauma-focused treatment of pregnant women that have formally been classified as having PTSD, the absence of cases diagnosed using the Clinician Administered PTSD Scale (CAPS-5), and to further enrich the literature on this subject, we report the results of a first-line trauma-focused therapy (i.e., EMDR therapy) in a pregnant woman with PTSD aimed at processing the memories of a previous distressing childbirth.

METHODS OF LITERATURE REVIEW

Literature search.

A systematic search of the literature was carried out in accordance with the PRISMA guidelines[20]. The current study was registered prospectively in the PROSPERO database. Relevant articles that were published from 1980 to June 2019 were identified in four databases (PubMed, Embase, PsychINFO and Cochrane Library). Search terms consisted of a combination of several synonyms for post-traumatic stress disorder/trauma, pregnancy/childbirth/postpartum, and treatment, in combination with relevant database specific MeSH terms (Appendix A). The language was restricted to English and Dutch. After removing all duplicates, author MB reviewed all title and abstracts. The remaining articles were assessed for eligibility by full-text reviewing by both MB and LB. Inclusion criteria consisted of (1) pregnant women in research population, (2) intervention study, (3) outcome including PTSD diagnosis or PTSD symptoms. Inclusion was not restricted to trauma-focused or evidence-based interventions. In addition, references were searched for relevant articles that fulfilled the inclusion criteria. After discussion, consensus was reached among the reviewers in all cases. Independently, data was extracted by both reviewers using a standardized data abstraction form, and a quality assessment was performed using the Cochrane Risk of Bias Tool[21]. Minor disagreements were discussed and consented. Interventions were referred to as trauma-focused if they consisted of

evidence-based psychotherapy for PTSD, involving direct discussion of the traumatic event (e.g. imagery exposure, cognitive restructuring of trauma-related beliefs, EMDR therapy). Safety was defined as the absence of any adverse events, such as increased suicidal ideation, suicidal attempts, serious self-injurious behaviour (injuries that needed hospitalization) and crisis contacts (contacts with healthcare providers in case of mental health crisis, where a person thinks about suicide of self-harm) for any of the aforementioned reasons (FDA, 2016). Regarding obstetrical safety we evaluated serious adverse events in terms of preterm birth earlier than 32 weeks gestational age, fetal growth restriction, or (maternal, fetal or neonatal) death.

METHODS OF CASE STUDY

A pregnant woman was randomized for EMDR therapy within the OptiMUM-study, a multicentre Randomized Controlled Trial that evaluates the safety and efficacy of EMDR therapy for pregnant women with PTSD or Fear of Childbirth after previous childbirth[23].

EMDR therapy included all eight phases of the EMDR standard (three-pronged) protocol. To address patients' anticipatory fear and avoidance behaviour (i.e., giving birth to another child), the flashforward protocol[24] was applied to target patients' most scary fantasies (i.e., the baby dying intrapartum, or the need for an emergency caesarean section). This was followed with a mental video check: the patient imagines a movie of a future confrontation with the situation or object, seeing themselves coping with the challenges. If the patient feels any tension, she opens her eyes and a set of eye movements will be conducted before continuing the mental video. This is repeated until the movie can be played without any significant disturbance[24,25]. EMDR therapy was carried out with the use of rapid deployment of sets of eye movements. To maximize taxation of patients' working memory[26], the therapist was allowed to switch to the use of a light bar in combination with earphones with a clicking sound, alternating to either the left or the right ear, and two hand-holdable pulsers providing alternating bilateral, tactile stimulation.

Measures

The WDEQ (Wijma Delivery Expectations/experiences Questionnaire A/B[27] assesses Fear of Childbirth (FoC) during pregnancy (version A), or after delivery (version B) in terms of the woman's cognitive appraisal of childbirth. It is possible to dichotomize the total sum score to conclude if there is FoC or not (cut-off ≥85)[27].

The PSS-SR (PTSD symptom scale)[28] is a 17-item self-report questionnaire that was used to assess the course of PTSD-symptoms.

The Dutch CAPS-5 (Clinician-administered PTSD scale) was used[29]. The CAPS is the gold standard for diagnosing PTSD according to DSM-5.

The MINI-plus (Mini international neuropsychiatric interview-plus)[30] is a structured interview for axis I DSM-IV conditions, and was used to evaluate comorbidity.

RESULTS OF THE SYSTEMATIC REVIEW

Figure 1 presents the stage-wise results of the article selection process. The literature search resulted in 10.927 eligible articles. After eliminating duplicates, a total of 7808 articles remained. Next, 7780 articles were excluded after reviewing title and abstract because these did not meet inclusion criteria. Subsequently, full-text review took place of the pre-selected 28 articles by both reviewers. In addition, three articles were included from reference lists of the selected articles. Finally, 13 articles were included for the analysis (Tables 1 and 2). Due to large heterogeneity between the studies in design, study population and measurement of symptoms, pooling of data for a meta-analysis proved not to be feasible.

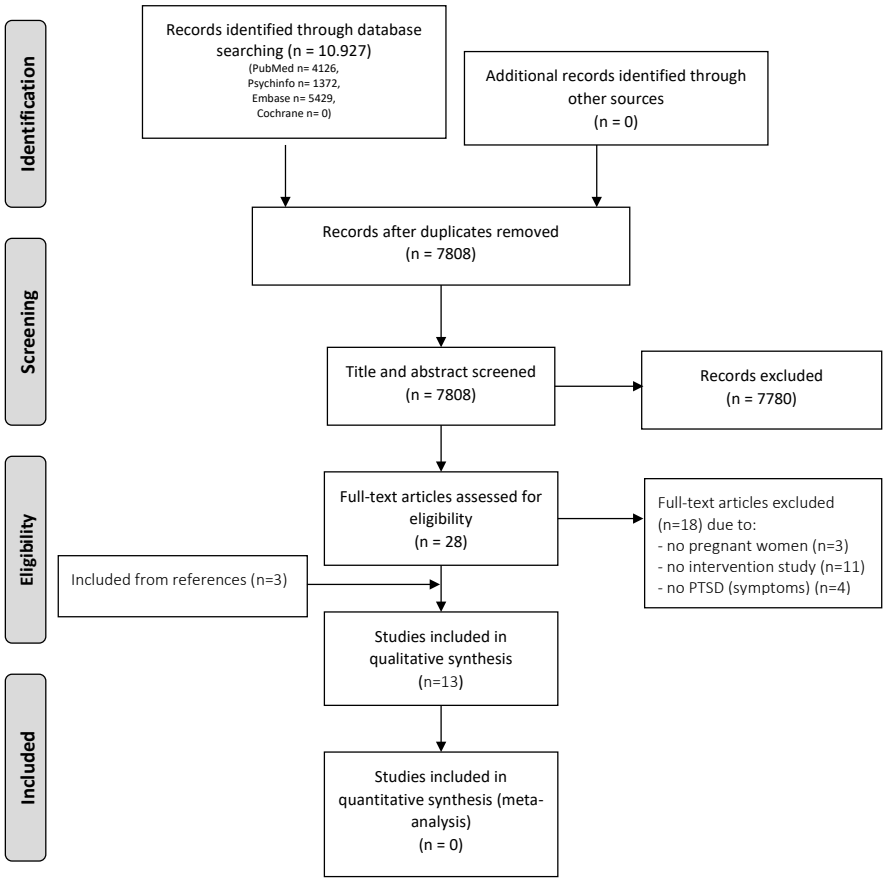


Figure 1. Article selection process

Setting and design

All studies were published in English. All but one[31] studies were conducted in high-income countries. Recruitment methods varied widely. Some studies included only patients that were self-referred[32,33] or referred by their maternity care provider[34,35] based on reporting PTSD (symptoms), while in two studies recruitment consisted of screening all pregnant women of a certain cohort for PTSD (symptoms)[36,37]. One study[31] included pregnant women during their hospital admission for hyperemesis gravidarum, whereas in all other studies recruitment took place in outpatient settings. Gestational age at the start of therapy was reported in eight out of 13 included studies. In four studies therapy started before the third trimester without any further specification[36–39], in two studies the intervention started in the second trimester[33,40], and in two studies in the third trimester[32,35].

Four out of 13 studies contained a control group[37,40–42]. In three of these studies the effectiveness of the intervention was compared with standard prenatal care, whereas in the fourth study[42] participants in the control group were offered educational material and a listing of resources for victims of domestic violence in addition to standard prenatal care.

Participants

Correcting for two studies describing the same sample of 32 participants[38,39], treatments aimed at symptoms of PTSD were evaluated in a total of 206 pregnant women. In three out of the 13 included studies the traumatic event was patients' first childbirth[34,35,43] and in one study an obstetric procedure[32]. In the other studies, the traumatic events included childhood maltreatment, physical or sexual abuse and in two studies[33,37] a series of such events.

Assessment

Validated instruments to assess symptoms of PTSD were used in nine of the 13 studies. In only five of these a DSM-IV PTSD-diagnosis was established using a standardized clinician-administered interview for PTSD[33,38,40,42] (see Table 1). In four of the 13 studies no formal instruments (i.e., established clinical interviews or self-report questionnaires) were used. The gold standard for diagnosing PTSD, the Clinician Administered PTSD Scale (CAPS-5[29]), was not used in any of the included studies. Whether or not psychiatric comorbidity was present was reported in two studies[34,40].

Interventions

The 13 included studies contained the use of eight types of interventions. These interventions can be categorized into six different therapeutic frameworks or approaches, of which four were aimed at targeting memories of traumatic events[31,34,35,40,4333] and two include other ways to cope with the symptoms related to PTSD[32,36,39,41,42,44], see Table 1. Five studies evaluated evidence-based treatments for PTSD[31,33,34,40,43]. In two case studies, each on one patient, the number of sessions was not described[32,35]. In all other studies, the interventions varied largely in duration, ranging from two sessions of an unknown

amount of minutes[31] to a total of 14 sessions with 30–45 minutes of in-session exposure in session 5 to session 14[33].

Trauma-focused therapy

Trauma-focused treatments were evaluated in six studies. One study used 12 sessions trauma-focused cognitive behavioural therapy (TF-CBT[40]). Twohig et al.[33] applied 14 sessions of exposure therapy only. Three studies examined two to four sessions standard EMDR therapy [31,34,43]. Slater[35] investigated self-hypnosis and relaxation and "rewind techniques" aimed at the traumatic event.

Non-trauma-focused interventions

A non-trauma-focused treatment approach was evaluated in seven studies. Zlotnick et al.[41] examined the effect of four sessions interpersonal psychotherapy which included helping patients improving their social network, and other forms of empowerment to prepare them for their transition into motherhood. All other studies evaluating a non-trauma-focused treatment offered interventions in a psychoeducational framework. Beck et al.[32] studied a psychoeducational intervention focused on normalizing the future birth experience by making realistic expectations. Stevens et al. [36] evaluated a method named TO-CARE (Trauma-sensitive Obstetrics to promote Control, Anxiety-Reduction and Empowerment), in which six weekly sessions of cognitive behavioural therapy (CBT) were conducted including trauma education, relaxation techniques, assertive communication skills and enhancing coping. In addition, patients were supported to use adequate coping mechanisms by their obstetric physicians, who were coached to recognize and support patients with symptoms of PTSD. Three studies from one research group examined the use of the "Survivor Moms Companion" self-study intervention[38,39,42], which includes 10 self-study modules aimed at psycho-education, skills training, and addressing the woman's needs in terms of emotional support. One study examined the effects of the "Seeking Safety Intervention", an eight-session intervention also focusing on developing adequate mechanisms to cope with symptoms of PTSD[37].

Treatment effectiveness

Improvement of PTSD symptoms was reported in 10 of the 13 studies, yielding significant results in four studies[36–39]. All three studies that evaluated EMDR therapy showed a decrease in PTSD symptoms in short-term as well as in follow-up[31,34,43], effects that lasted up to 36 months[43]. However, due to the nature of the EMDR studies being case series, significance could not be tested. Application of CBT[33] resulted in a decrease in PTSD, and TF-CBT[36] reached a significant decrease in PTSD symptoms on self-report measurements. Finally, two interventions aimed at psycho-education (i.e., "Seeking Safety Intervention" and "Survivor Moms Companion"), showed a significant decrease in PTSD symptoms in three studies[37–39] (Seng et al, 2011; Sperlich et al., 2011; Weinreb et al, 2018).

Outcome measures of safety

Only one study explicitly reported a strategy for collecting or analysing safety information[39]. The authors reported no adverse events. Obstetrical outcome was not reported in eight of the 13 included studies, and quantified in only one[37]. Stramrood et al.[34] reported a postpartum haemorrhage in one patient with pre-existent risk factors for postpartum haemorrhage. Because this incident does not fit our safety definition we did not consider it as a serious adverse event.

Due to this lack of safety data, corresponding authors were contacted for any additional information. Of the 11 authors that were contacted, six authors responded. They reported no additional safety information[40,44] or indicated an absence of occurrence of adverse events[31,33,34,36].

Table 1. *Characteristics of included studies.*

Author	Type of study	N	Inclusion criteria	Exclusion criteria	Type of intervention	Number of sessions	Traumatic Event	Assessment of (symptoms of) PTSD
Beck et al. (2006)	Case series	1 of 2	Not reported	Not reported	Psycho-education	Not reported	Fetal reduction	No instruments
Kavakci et al. (2014)	Case series	1 of 5	Inpatient pregnant women with therapy-resistant hyperemesis	Not reported	EMDR therapy (tapping)	2	Domestic violence	No instruments
Madigan et al. (2015)	RCT	10 intervention versus 11 controls	Adolescents between 12-23 weeks pregnant, planning to keep their baby, fluent in English, meeting criteria for an unresolved classification on the AAI *or* DSM-IV criteria for PTSD	Current suicidal ideation, ongoing substance use and/ or evidence of psychosis	Trauma-focused CBT	12	Not reported	C-PTSD-I
Rowe et al. (2014)	Quasi-experimental study	17 intervention versus 43 matched controls	Pregnant women with a history of childhood maltreatment	Active psychotic disorders, untreated substance abuse, past year suicide attempts, intimate partner or parents abuse, high-risk pregnancy conditions, psychotropic medication, current long-term psychotherapy	Psycho-education ("Survivor Moms Companion")	10	Childhood maltreatment	NWS-PTSD
Sandstrom et al. (2008)	Case series	1 of 4	Severe fear of childbirth after a previous traumatic childbirth, DSM-IV PTSD	Not reported	EMDR therapy	2	Childbirth	TES

Table 1. *Characteristics of included studies. (continued)*

Author	Type of study	N	Inclusion criteria	Exclusion criteria	Type of intervention	Number of sessions	Traumatic Event	Assessment of (symptoms of) PTSD
Seng et al. (2011)	Quasi-experimental study	32	English speaking, currently at less than 28 weeks gestational age, a history of childhood maltreatment or sexual trauma, experiencing at least some posttraumatic stress sequelae, willingness to complete the modules and measures	Active psychotic disorders, untreated substance abuse, past year suicide attempts, intimate partner or parents abuse, high-risk pregnancy conditions, psychotropic medication, current long-term individual psychotherapy	Psycho-education ("Survivor Moms Companion")	10	Childhood maltreatment or sexual abuse	NWS-PTSD
Slater (2015)	Case series	2	Pregnant women with posttraumatic stress disorder	Not reported	Self-hypnosis, relaxation, rewind technique. Spiegel induction method.	4 / not reported	Childbirth	No instruments
Sperlich et al. (2011)	Quasi-experimental study	32	(see seng et al., 2011)	(see seng et al., 2011)	Psycho-education ("Survivor Moms Companion")	10	Childhood maltreatment or sexual trauma	NWS-PTSD

Table 1. *Characteristics of included studies. (continued)*

Author	Type of study	N	Inclusion criteria	Exclusion criteria	Type of intervention	Number of sessions	Traumatic Event	Assessment of (symptoms of) PTSD
Stevens et al. (2019)	Cohort study	21	Less than 30 weeks pregnant, history of physical or sexual abuse, reported at least three or more PTS symptoms, fluent in English. Completing at least three sessions of CBT.	History of bipolar disorder or psychosis, significant suicidal ideation or risk, or suffered from medical conditions that would impact participation	CBT (non-trauma-focused), trauma-sensitive care,	6	Physical or sexual Abuse	PCL-C
Stramrood et al. (2012)	Case series	3	Pregnant women with posttraumatic stress symptoms following previous birth	Not reported	EMDR therapy	2-4	Childbirth	No instruments
Twohig et al. (2007)	Case series	1	Not reported	Not reported	Exposure therapy (trauma-focused)	14	A series of traumatic events, including abuse	SCID, PCL-C
Weinreb et al. (2018)	RCT	89 intervention versus 60 controls	Screenings at threshold level (3-4 symptoms) or sub-threshold level (2 symptoms) on PC-PTSD, ≥18 years old, < 27 weeks gestation, spoke one of the languages of the prenatal care advocates.	Not reported	Psycho-education ("Seeking Safety intervention")	8	Multiple types of trauma, the majority physical or sexual abuse	PC-PTSD, PSS

Table 1. *Characteristics of included studies. (continued)*

Author	Type of study	N	Inclusion criteria	Exclusion criteria	Type of intervention	Number of sessions	Traumatic Event	Assessment of (symptoms of) PTSD
Zlotnick (2011)	RCT	28 versus 26 controls	Pregnant women between 18-40 years old, with intimate partner violence in the past year	Current affective disorders, PTSD or substance use as determined by SCID-NP	Interpersonal psychotherapy	5	Intimate partner violence	DTS

Note. AAI= Adolescent/Adult Attachment Interview, CBT= Cognitive Behavioural therapy, C-PTSD-I= Children's PTSD Inventory, DSM= Diagnostic and Statistical Manual of Mental Disorders, DTS= Davidson Trauma Scale, EMDR= Eye Movement Desensitization and Reprocessing therapy, PCL-C= PTSD Symptom Checklist for Civilians, PC-PTSD=Primary Care-PTSD screen, PSS= Posttraumatic Stress Scale, PTSD= Posttraumatic Stress Disorder, SCID= Structured Clinical Interview for the DSM, NWS-PTSD= National Women's Study PTSD Module, Traumatic Event Scale.

Table 2. *Effects and safety of interventions of included studies.*

Author	Retention (% completers)	Effects (symptom measurement, or if absent, indirect measurements)	Safety	Follow-up
Beck et al. (2006)	1/1 (100%)	Undergoing caesarean delivery without any significant anxiety or fear.	Healthy infant	Not reported
Kavakci et al. (2014)	1/1 (100%)	Complete remission of PTSD symptoms	No serious adverse events	Timing not specified
Madigan et al. (2015)	12/21 (57%) at leat five sessions	No differences on PTSD classification between groups	Not reported	6 and 12 months postpartum
Rowe et al. (2014)	69%	The intervention group had significantly less dissociation in labor (d=0.46) compared to the control group. No significant results in PTSD symptoms.	(see Sperlich et al., 2011)	Not reported
Sandstrom et al. (2008)	0/1 (did not show at final appointment)	At the end of the last session SUD related to the emotionality of the traumatic memory decreased. However, other disturbing memories started to appear during therapy. After treatment: missing data at one year postpartum. Three years postpartum PTSD cluster and sum score decreased.	Not reported	1-3 years
Seng et al. (2011)	18/32 (56%) all ten modules	Intention-to-treat analysis showed no significant change in PTSD symptoms. In completers, there was a significant decrease in level of PTSD symptoms (η^2=0.5).	(see Sperlich et al., 2011)	Not reported
Slater (2015)	2/2 (100%)	Patient 1: Still anxious, but persistent neutral feelings about previous childbirth.	Uneventful caesarean, healthy baby	A few weeks
		Patient 2: relaxation during hypnosis. Remained anxious after delivery, but suffered no adverse psychological disturbances.	Healthy infant	Not reported
Sperlich et al. (2011)	18/32 (56%) all ten modules	PTSD scores as indexed with MPSS decreased significantly (large effect size).	No serious adverse events	Not reported

Table 2. *Effects and safety of interventions of included studies. (continued)*

Author	Retention (% completers)	Effects (symptom measurement, or if absent, indirect measurements)	Safety	Follow-up
Stevens et al. (2019)	21/45 (46%) at least three sessions	Four participants (19%), and one participant (4,8%) demonstrated significant improvements in PTSD symptoms direct posttreatment and 6 weeks postpartum compared to pretreatment.	No serious adverse events	6 weeks postpartum
Stramrood et al. (2012)	3/3	Patient 1: No physical symptoms when passing the hospital, more relaxed, less emotional, no guilt. Attempted vaginal childbirth.	No serious adverse events. Caesarean, healthy infant. Positive birth experience	Not reported
		Patient 2: Calmer, less alone, more confident about upcoming birth. Attempting vaginal childbirth instead of elective caesarean at first	No serious adverse events. Uncomplicated vaginal childbirth, positive birth experience	Not reported
		Patient 3: No posttraumatic stress symptoms, no debilitating anxiety, calmer, better emotional coping.	No serious adverse events. Postpartum hemorrhage (1100ml) and hypertension. Positive birth experience	Not reported
Twohig et al. (2007)	1/1	PTSD symptoms decreased throughout treatment, and this decrease continued at follow-up two months after treatment.	No serious adverse events Vaginal delivery, healthy mother and infant	Two months after treatment
Weinreb et al. (2018)	51/89 (57%) all sessions	PTSD symptoms decreased over time in both groups, but the intervention group showed significantly greater improvements(d=0.34).	No significant differences in birth outcome	One month postpartum
Zlotnick et al. (2011)	Not reported	No significant reduction of symptoms of PTSD during pregnancy or postpartum. During pregnancy moderate effect for reducing PTSD symptoms (d=0.78) and from pregnancy up to three months postpartum (d=0.35).	Not reported	Three months postpartum

Note. HG= hyperemesis gravidarum, OO= Obstetrical Outcome, MPSS= Modified Posttraumatic Stress Disorder (PTSD) Symptom Scale, NR=not-reported, PCL-C= PTSD Checklist Civilian Version, PTSD= Posttraumatic Stress Disorder

Risk of bias in included studies

Three of the included studies were conducted as randomized controlled trials, all other studies therefore have a considerable risk of bias. The risk of bias is summarized for each study in Figure 2. Nine of the 13 studies evaluated one type of intervention, resulting in a lack of applicability of several aspects of risk of bias analysis. Although blinding of participants and personnel when conducting psychological interventions is impossible, blinding of outcome measurements is possible. Only Madigan et al.[40] reported blinded outcome assessment while all other studies did not report on blinding.

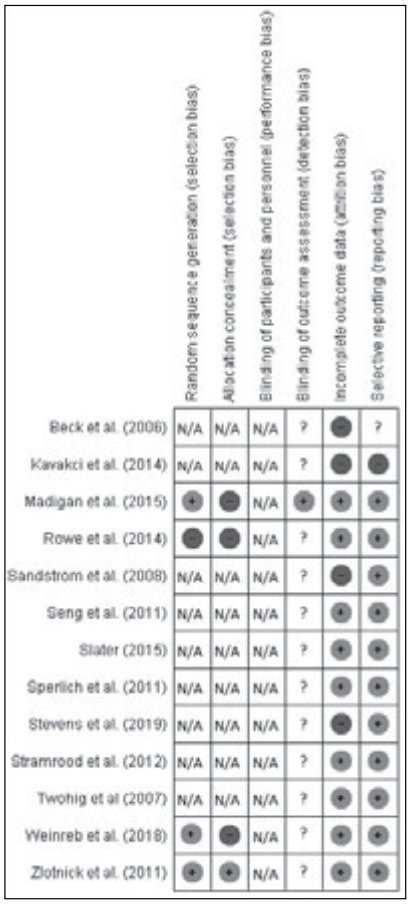


Figure 2. Risk of Bias summary of Included Studies.
The minus sign represents a high risk of bias, the plus sign a low risk of bias, and the question mark an unclear risk of bias. N/A is not applicable.

RESULTS OF THE CASE STUDY

Patient A was a 36 year old multipara pregnant woman, who delivered three times before. Her first delivery was complicated by a postpartum haemorrhage due to a retained placenta. In her second pregnancy, she received one EMDR session aimed at the loss of control during her first delivery. Her PTSD symptoms decreased after this therapy session and the delivery was uncomplicated. In her third pregnancy an intra-uterine fetal death occurred unexpectedly at a gestational age of 39 weeks. Postpartum, she received about 10 monthly sessions of grief therapy.

During the screening for the OptiMUM-study in her fourth pregnancy she scored above the cut-off for both PTSD and FoC (WDEQ-A total score: 98). During the first clinical interview, she was diagnosed with an obsessive compulsive disorder with intrusive thoughts preoccupied with guilt about several aspects of her life. When administering the CAPS-5, at first she identified her first childbirth as the "worst" in terms of emotional difficulties in the aftermath. After continuing the interview, she quickly corrected herself: the intra-uterine fetal death in her third pregnancy was the most traumatic (CAPS-5 sum score: 26).

In the first session, the treatment plan was the EMDR target, second the flash forward followed by a mental videotape. The session commenced with the EMDR target of the image of herself, sitting with her baby, and her partner hugging her and her baby. The SUD (Subjective Units of Disturbance Scale; while looking at the image, the client rates the felt disturbance on a scale 0-10, where 0 is no disturbance or neutral, 10 is the highest disturbance one can imagine) was 8, and tension was mostly felt in her abdomen. During the course of the session the SUDs went from 8 to 1. The second therapy session started with flashforward EMDR aimed at the image of herself in a hospital bed with her partner next to her, and the same doctor who diagnosed the intra-uterine fetal death saying to her "I have something terrible to tell you…". Looking at this image, she felt extreme sadness, SUD 10. Besides eye movements, 'buzzers' were added. During the course of this session the SUDs decreased from 10 to 0 (VoC 7). She felt no tension in her body anymore.

At start of the third session, she indicated that she was doing very well, experiencing less tension. A mental video check was conducted in which she constructed her future childbirth.

After finishing therapy, at 36 weeks gestational age, she scored under the cut-off value for FoC (WDEQ-A score 84), and the diagnoses of obsessive-compulsive disorder and PTSD (CAPS sum score 9) were in complete remission. She had an uncomplicated childbirth at term. Postpartum she rated the satisfaction around pregnancy and delivery both 8 out of 10. At follow-up her PTSD and FoC-symptoms showed further decrease (CAPS-5 sum score: 3; WDEQ-B: 54). For the treatment response of patient A, see Figure 3.

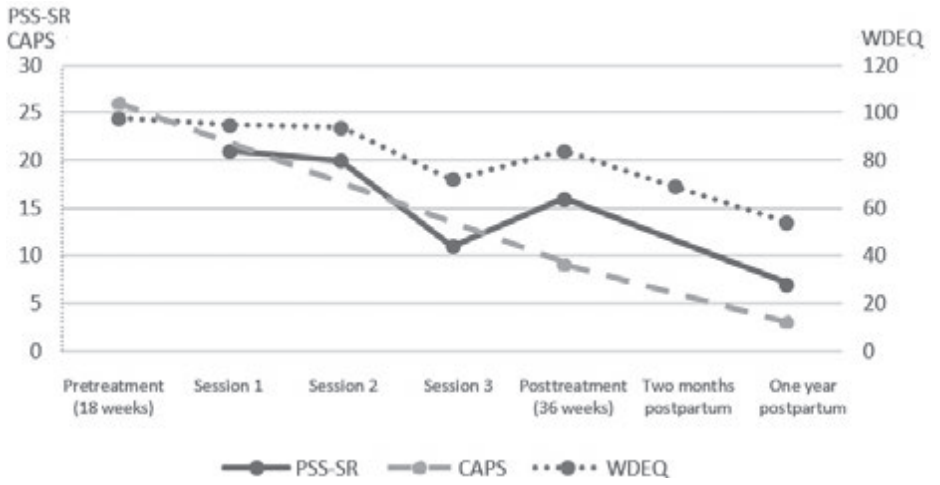


Figure 3. Treatment response patient A.

DISCUSSION

This is the first systematic review evaluating the effectiveness and safety of treatment for PTSD symptoms during pregnancy. The results show that the literature on this topic is scarce, and that there is large heterogeneity in study designs. The 13 included studies that have been carried out until now examined eight types of interventions of which most lacked a proper research design, six studies were small-number case series with a maximum of three cases, and only three studies used a RCT design. Although improvement in PTSD symptoms was demonstrated in 10 studies, due to the poor methodological quality of the included studies it is impossible to draw conclusions about the effectiveness or superiority of any particular treatment for PTSD or its symptoms during pregnancy. Also, many of the interventions were not evidence-based. In addition, because few studies used control groups, we cannot determine whether the interventions are better than a control group or not. Conversely, no indications were found supporting the notion that therapy aimed to reduce PTSD symptoms would be harmful.

The latter finding was supported by our single case study, including a pregnant woman with a formal DSM-5 PTSD diagnosis using the gold standard clinical interview. It was found that after three sessions of EMDR therapy, she no longer fulfilled the diagnostic criteria of PTSD, scored below the threshold for Fear of Childbirth, and experienced an uncomplicated delivery.

In this review, as far as safety data were available, we found no support for a course of action in which the continued presence of PTSD is preferable to the low chance of short-term physiological arousal during treatment for symptoms of PTSD. There is mounting evidence that PTSD is associated with elevated levels of the stress hormone cortisol. For

example, Seng et al.[45] found that pregnant women with PTSD related to childhood abuse showed cortisol levels up to 10 times higher than their non-traumatized counterparts. The effect of exposure to such high levels of maternal stress hormones on the fetal HPA-axis and related brain areas during pregnancy has been found to exert lasting negative effects on the foetus and on child development, including verbal skills, attention deficits, and learning[18,19,46]. Therefore, in these cases, it seems much more important to intervene, and first of all to bring down the chronic stress and related cortisol levels, so that the fetus can grow in a more optimal and safe environment, rather than fear the possible stress of the treatment of PTSD, a negative effect that has never been demonstrated.

This study has several limitations, most notably the small number of studies that are eligible to be included in systematic reviews and meta-analyses. Study populations were mostly very heterogeneous, inclusion criteria varied across studies from probable posttraumatic symptoms during intake to a formally established PTSD diagnosis, with designs not allowing pooled analyses. Measurements of symptoms of PTSD varied largely, was sometimes indirect ("*undergoing a caesarean 'without significant anxiety or fear'*"[32]), and only five studies used a standardized clinical interview for diagnosing PTSD[38–40,42]. In addition, the lack of protocolled safety measures and obstetrical outcome data of the studies that have been carried out so far is a severe limitation that makes it difficult to draw reliable conclusions. Despite these limitations several recommendations can be made. Foremost, in future research to use validated PTSD-measures including a clinical interview. Furthermore, future studies should focus on established evidence-based treatments according to international treatment guidelines for PTSD (e.g., PE, CBT, EMDR therapy). In addition, they should have adequate designs: RCT's with sufficient power and low risk of bias, actively monitoring safety and reporting on any adverse events, comorbid psychopathology and obstetrical outcomes.

In conclusion, due to the poor methodological quality of most studies it is impossible to allow inferences on the effects of any particular treatment of PTSD (symptoms) during pregnancy. Yet, given the elevated maternal stress and cortisol levels in pregnant women with PTSD, and the fact that so far no adverse effects on the unborn child have been reported associated with the application of trauma-focused therapy, treatment of PTSD during pregnancy is most likely safe. Further research is necessary to rule out the possibility of harm when applying (trauma-focused or non-trauma focused) therapy, and to give the early life of the baby the chance to start its life with the love of a mother who is not tormented and haunted by intrusions from the past.

Acknowledgements

We thank our participants, clinical interviewers, therapists, local researchers, independent physician, and all midwives and obstetrician-gynecologists who aided in making this the OptiMUM-study possible. We also thank librarian/information specialist Bert Berenschot for helping with the literature search.

Funding details

This work was supported by grants from the Stichting EMDR Nederland (Dutch EMDR Association), Stichting Teaching Hospital OLVG, Fonds Gezond Geboren and Stichting Wetenschap OLVG, all awarded to the principal investigator MG van Pampus.

Supplemental online material

S1. Search terms

REFERENCES

1. Alcorn KL, O'Donovan A, Patrick JC, Creedy D, Devilly GJ. A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. Psychol Med. 2010;40(11):1849–59.
2. Haagen JFG, Moerbeek M, Olde E, Van Der Hart O, Kleber RJ. PTSD after childbirth: A predictive ethological model for symptom development. J Affect Disord. 2015;185.
3. Olde E, van der Hart O, Kleber RJ, Van Son MJ, Wijnen HAA, Pop VJM. Peritraumatic Dissociation and Emotions as Predictors of PTSD Symptoms Following Childbirth. J Trauma Dissociation, 6. 2005;6(3):125–142.
4. Stramrood CAI, Paarlberg KM, Huis In't Veld EMJ, Berger LWAR, Vingerhoets AJJM, Weijmar Schultz WC, et al. Posttraumatic stress following childbirth in homelike- and hospital settings. J Psychosomic Obstet Gynaecol. 2011;32(2):88–97.
5. Soet JE, Brack G, Dilorio C. Prevalence and predictors of women's experience of psychological trauma during childbirth. Birth. 2003;1:36–46.
6. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016 Apr 16;46(06):1121–34.
7. Grekin R, O'Hara M. Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. Clin Psychol Rev. 2014;34(4):389–401.
8. Yildiz PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: A systematic review and meta-analysis. J Affect Disord. 2016;18(2).
9. Söderquist J, Wijma B, Wijma K. The longitudinal course of post-traumatic stress after childbirth. J Psychosom Obstet Gynaecol. 2006;27(2):113–9.
10. Beck CT, Watson S. Subsequent Childbirth After a Previous Traumatic Birth. 2010;59(4):241–9.
11. Cook N, Ayers S, Horsch A. Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. J Affect Disord. 2018;1(225):18–31.
12. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.
13. Ayers S, Wright DB., Ford E. Traumatic birth and hyperarousal symptoms: are they normal or pathological? J Reprod Infant Psychol. 2015;(Special Issue 33):282–293.
14. Fuglenes D, Aas E, Botten G, Øian P, Kristiansen IS. Why do some pregnant women prefer cesarean? The influence of parity, delivery experiences, and fear. Am J Obstet Gynecol. 2011;205(1):45–9.
15. NICE. Post-traumatic stress disorder. Evidence reviews on care pathways for adults, children and young people with PTSD. 2018. p. Retrieved from https://www.nice.org.uk/ guidance/n.
16. Shields K, Lyerly A. Exclusion of pregnant women from industry-sponsored clinical trials. Obs Gynecol. 2013;122(5):1077–81.
17. Forgash C, Leeds A, Stramrood C a. I, Robbins A. Case Consultation: Traumatized Pregnant Woman. J EMDR Pract Res. 2013;7(1):45–9.
18. LeWinn KZ, Stroud LR, Molnar BE, Ware JH, Koenen KC, Buka SL. Elevated maternal cortisol levels during pregnancy are associated with reduced childhood IQ. Int J Epidemiol. 2009;38:1700–10.

19. Graham AM, Rasmussen JM, Entringer S, Ben Ward E, Rudolph MD, Gilmore JH, et al. Maternal Cortisol Concentrations During Pregnancy and Sex-Specific Associations With Neonatal Amygdala Connectivity and Emerging Internalizing Behaviors. Biol Psychiatry. 2019;85(2):172–81.

20. Moher D, Liberati A, Tetzlaff J, Altman D. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. 2009;3(3):123–30.

21. Higgins JPT, Altman DG, editors. Chapter 8: Assessing risk of bias in included studies. In: Cochrane Handbook for Systematic Reviews of Interventions Version 501 (updated September 2008) [Internet]. The Cochrane Collaboration; 2008. Available from: www.cochrane-handbook.org.

22. What is a Serious Adverse Event? [Internet]. [cited 2020 Mar 2]. Available from: https://www.fda.gov/safety/reporting-serious-problems-fda/what-serious-adverse-event

23. Baas MAM, Stramrood CAI, Dijksman LM, de Jongh A, van Pampus MG. The optiMUM-study: EMDR therapy in pregnant women with posttraumatic stress disorder after previous childbirth and pregnant women with fear of childbirth: Design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1).

24. Logie R, de Jongh A. The “Flashforward procedure”: Confronting the Catastrophe. J EMDR Pract Res. 2014;8(1):25–32.

25. Shapiro F. Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures. 3rd ed. New York, NY, US: Guilford Press; 2018.

26. de Jongh A, Ernst R, Marques L, Hornsveld H. The impact of eye movements and tones on disturbing memories involving PTSD and other mental disorders. J Behav Ther Exp Psychiat. 2013;44:477–83.

27. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84–97.

28. Foa EB, Cashman L, Jaycox L, Perry K. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. Psychol Assess. 1997;9:445–51.

29. Boeschoten MA, Bakker A, Jongedijk RA, van Minnen A, Elzinga BM, Rademaker AR, et al. Clinician Administered PTSD Scale for DSM-5 – Dutch version. Arq Psychotrauma Expert Groep, editor. Diemen; 2014.

30. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 1998;59:34–57.

31. Kavakci O, Yenicesu GI. Eye Movement Desensitization and Reprocessing (EMDR) for Hyperemesis Gravidarum. J Psychiatry Neurol Sci. 2014;27(4):335–41.

32. Beck CT, Barnes DL. Post-traumatic stress disorder in pregnancy. Ann Am Psychother Assoc. 2006;4–9.

33. Twohig MP, Donohue WTO. Treatment of Posttraumatic Stress Disorder with Exposure Therapy During Late Term Pregnancy. Clin Case Stud. 2007;6(6):525–35.

34. Stramrood CAI, Van der Velde J, Doornbos B, Paarlberg KM, Weijmar Schultz WC, Van Pampus MG. The patient observer: eye-movement desensitization and reprocessing for the treatment of posttraumatic stress following childbirth. Birth. 2012;39(1):70–6.

35. Slater P. Post-traumatic stress disorder managed successfully with hypnosis and the rewind technique : two cases in obstetric patients. Int J Obstet Anesth. 2015;24(3):272–5.

36. Stevens NR, Lillis TA, Wagner L, Tirone V, Hobfoll SE, Lillis TA, et al. A feasibility study of trauma-sensitive obstetric care for low-income, ethno-racial minority pregnant abuse survivors. J Psychosom Obstet Gynecol. 2019;40(1):66–74.

37. Weinreb L, Wenz-gross M, Upshur C. Postpartum outcomes of a pilot prenatal care-based psychosocial intervention for PTSD during pregnancy. Arch Womens Ment Heal. 2018;21(3):299–312.

38. Seng JS, Sperlich M, Rowe H, Cameron H. The Survivor Moms' Companion: Open Pilot of a Posttraumatic STress Specific Psychoeducation Program for Pregnant Survivors of Childhood Maltreatment and Sexual Trauma. Int J Childbirth. 2011;1(2).

39. Sperlich M, Seng JS, Rowe H, Cameron H. The Survivor Moms' Companion; feasibility, Safety, and Acceptability of a Posttraumatic Stress Specific Psychoeducation Program for Pregnant Survivors of Childhod Maltreatment and Sexual Trauma. Int J Childbirth. 2011;1(2):122-135.

40. Madigan S, Vaillancourt K, Mckibbon A, Benoit D, Madigan S, Vaillancourt K, et al. Trauma and traumatic loss in pregnant adolescents : the impact of Trauma-Focused Cognitive Behavior Therapy on maternal unresolved states of mind and Posttraumatic Stress Disorder. Attach Hum Dev. 2015;17(2):175–98.

41. Zlotnick C, Capezza N, Parker D. An interpersonally based intervention for low-income pregnant women with intimate partner violence: a pilot study. Arch Womens M. 2011;14(1):55–65.

42. Rowe H, Sperlich M, Seng J. A quasi-experimental outcomes analysis of a psychoeducation intervention for pregnant women with abuse-related posttraumatic stress. J Obs Gynecol Neonatal Nurs. 2014;43(3):282–93.

43. Sandström M, Wiberg B, Wikman M, Willman AK, Högberg U. A pilot study of eye movement desensitisation and reprocessing treatment (EMDR) for post-traumatic stress after childbirth. Midwifery. 2008;24(1):62–73.

44. Seng JS, Oakley DJ, Sampselle C., Killion C, Graham-Bermann S, Liberzon I. Posttraumatic stress disorder and pregnancy complications. Obstet Gynecol. 2001;97(1):17–22.

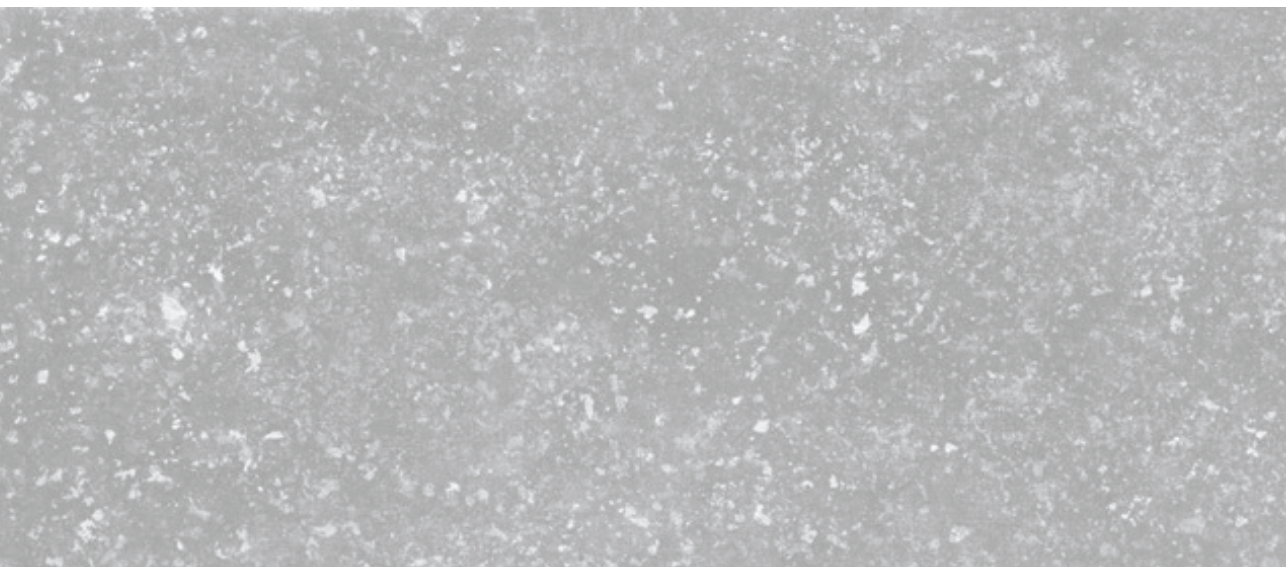
45. Seng JS, Li Y, Yang JJ, King A., Kane Low LM, Sperlich M, et al. Gestational and Postnatal Cortisol Profiles of Women With Posttraumatic Stress Disorder and the Dissociative Subtype. J Obs Gynecol Neonatal Nurs. 2018;47(1):12–22.

46. Owen D, Andrews MH, Matthews SG. Maternal adversity, glucocorticoids and programming of neuroendocrine function and behaviour. Neurosci Biobehav Rev. 2005;29(209–26).

S1: SEARCH STRATEGIES

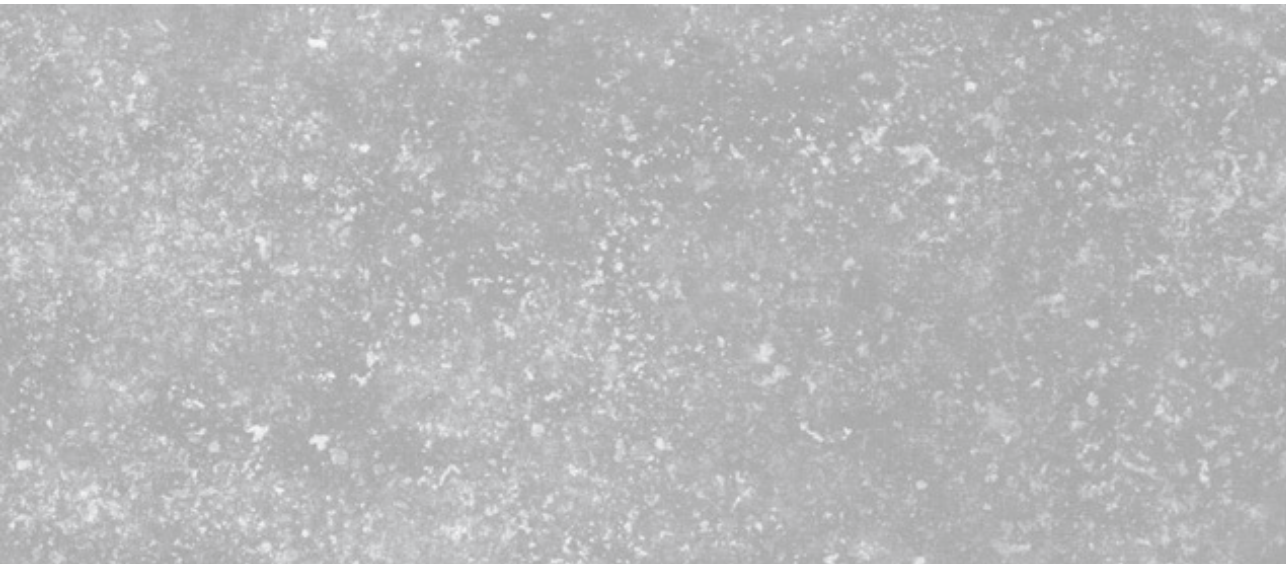
Database	Search strategies
PubMed	((“Stress Disorders, Post-Traumatic”[Mesh] OR “stress disorder”[Tiab] OR post-traumatic[Tiab] OR posttraumatic[Tiab] OR “ptsd”[Tiab] OR traumatic[Tiab] OR “psycho trauma”[Tiab] OR psychotrauma[Tiab] OR “stress response”[Tiab]) AND (“Postpartum Period”[Mesh] OR “postpartum”[Tiab] OR postnatal[Tiab] OR “Peripartum Period”[Mesh] OR “peripartum”[Tiab] OR perinatal[Tiab] OR “delivery”[Tiab] OR “obstetric”[Tiab] OR “obstetrics”[Tiab] OR “parturition”[Tiab] OR “childbirth”[Tiab] OR “birth”[Tiab] OR “Labor, Obstetric”[Mesh] OR “labour”[Tiab] OR “labor”[Tiab] OR pregnan*[Tiab])) AND (pharmacotherap* OR farmacotherap* OR medication OR psychotherap* OR therapy OR therapies OR therapeutic* OR treat* OR interven* OR EMDR OR “eye movement desensitization reprocessing”[MeSH] OR “eye movement” OR cognitive therap* OR cognitive treatment* OR cognitive behavioral OR cognitive behavioural) AND ((English[lang] OR Dutch[lang]))
EMBASE	exp posttraumatic stress disorder/ (stress disorder or post-traumatic or posttraumatic or ptsd or traumatic or psycho trauma or psychotrauma or stress response).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] 1 or 2 exp puerperium/ or exp perinatal period/ or exp labor/ (postpartum or postnatal or peripartum or perinatal or delivery or obstetric* or parturition or childbirth or birth or labour or labor or pregnan*).mp. 4 or 5 exp cognitive behavioral therapy/ or exp cognitive therapy/ or exp “eye movement desensitization and reprocessing”/ (pharmacotherap* or farmacotherap* or medication or psychotherap* or therap* or treat* or interven* or EMDR or eye movement or cognitive therap* or cognitive treatment* or cognitive behavioral or cognitive behavioural).mp. 7 or 8 3 and 6 and 9 Limit 10 to (dutch or English) Limit 11 to (article or article in press or “review”or short survey”

Database	Search strategies
PsycINFO	exp posttraumatic stress disorder/ (stress disorder or post-traumatic or posttraumatic or ptsd or traumatic or psycho trauma or psychotrauma or stress response).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures] 1 or 2 exp puerperium/ or exp perinatal period/ or exp labor/ (postpartum or postnatal or peripartum or perinatal or delivery or obstetric* or parturition or childbirth or birth or labour or labor or pregnan*).mp. 4 or 5 exp cognitive behavioral therapy/ or exp cognitive therapy/ or exp “eye movement desensitization and reprocessing”/ (pharmacotherap* or farmacotherap* or medication or psychotherap* or therap* or treat* or interven* or EMDR or eye movement or cognitive therap* or cognitive treatment* or cognitive behavioral or cognitive behavioural).mp. 7 or 8 3 and 6 and 9 Limit 10 to (dutch or english) Limit 11 to (journal article or reviews)
Cochrane	No formal search terms, manual search within topics ‘pregnancy & childbirth’, “gynaecology” and “mental health”



PART II

TREATMENT



CHAPTER 5

The OptiMUM-study: EMDR therapy in pregnant women with Posttraumatic Stress Disorder after previous childbirth and pregnant women with fear of childbirth: design of a multicentre randomized controlled trial

Baas MAM, Stramrood CAI, Dijksman LM, de Jongh, A., van Pampus MG. The OptiMUM-study: EMDR therapy in pregnant women with Posttraumatic Stress Disorder after previous childbirth and pregnant women with fear of childbirth: design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1):1293315. doi: 10.1080/20008198.2017.1293315

ABSTRACT

Background

Approximately 3% of women develop posttraumatic stress disorder (PTSD) after giving birth, and 7.5% of pregnant women show a pathological fear of childbirth (FoC). FoC or childbirth-related PTSD during (a subsequent) pregnancy can lead to a request for an elective caesarean section as well as adverse obstetrical and neonatal outcomes. For PTSD in general, and several subtypes of specific phobia, eye movement desensitization and reprocessing (EMDR) therapy has been proven effective, but little is known about the effects of applying EMDR during pregnancy.

Objective

To describe the protocol of the OptiMUM-study. The main aim of the study is to determine whether EMDR therapy is an effective and safe treatment for pregnant women with childbirth-related PTSD or FoC. In addition, the cost-effectiveness of this approach will be analysed.

Method

The single-blind OptiMUM-study consists of two two-armed randomized controlled trials (RCTs) with overlapping design. In several hospitals and community midwifery practices in Amsterdam, the Netherlands, all eligible pregnant women with a gestational age between eight and 20 weeks will be administered the Wijma delivery expectations questionnaire (WDEQ) to asses FoC. Multiparous women will also receive the PTSD checklist for DSM-5 (PCL-5) to screen for possible PTSD. The clinician administered PTSD scale (CAPS-5) will be used for assessing PTSD according to DSM-5 in women scoring above the PCL-5 cut-off value. Fifty women with childbirth-related PTSD and 120 women with FoC will be randomly allocated to either EMDR therapy carried out by a psychologist or care-as-usual. Women currently undergoing psychological treatment or women younger than 18 years will not be included. Primary outcome measures are severity of childbirth-related PTSD or FoC symptoms. Secondary outcomes are percentage of PTSD diagnoses, percentage caesarean sections, subjective childbirth experience, obstetrical and neonatal complications, and health care costs.

Results

The results are meant to provide more insight about the safety and possible effectiveness of EMDR therapy during pregnancy for women with PTSD or FoC.

Conclusion

This study is the first RCT studying efficacy and safety of EMDR in pregnant women with PTSD after childbirth or Fear of Childbirth.

INTRODUCTION

Posttraumatic Stress Disorder after childbirth, and Fear of Childbirth

Although pregnancy and childbirth are supposed to be joyful times, 25% of the pregnant women report having psychological problems[1]. Research indicates that up to 43% of women experience childbirth as traumatic[2], and it is estimated that 3% of all women will develop posttraumatic stress disorder (PTSD) following childbirth[3]. The main symptoms of PTSD, according to DSM-5, are re-experiencing, avoidance and numbing, negative cognitions and mood, and hyperarousal. These symptoms last more than one month and result in significant dysfunction[4]. By definition, PTSD after previous childbirth refers to PTSD with childbirth itself being the index trauma. The distinction with non-childbirth related PTSD that is ongoing or retriggered in the postpartum period is not always made correctly[3]. PTSD following other traumatic events is beyond the scope of this study, however, a history of trauma or psychiatric disorders such as PTSD are risk factors for childbirth-related PTSD. Childbirth-related PTSD can occur in the absence of medical complications, but prevalence has been found to be higher among women with complicated pregnancies[5]. For example, it appears that 14% of the women with preterm birth due to preeclampsia or premature preterm rupture of membranes proves to develop PTSD[6]. Posttraumatic stress symptoms after childbirth are not always self-limiting, leading to a chronic disorder[7]. Because the prospect of giving birth may trigger both memories of a previous distressing delivery as well as traumatic events such as sexual violence or previous medical trauma, pregnancy can be accompanied by severe childbirth-related anxiety and a disproportional fear of the upcoming delivery. In addition, avoidance symptoms of PTSD often manifest themselves as avoiding future pregnancy, avoiding prenatal care in a subsequent pregnancy, or demanding an elective caesarean section[8,9]. Moreover, (psychotraumatic) stress during pregnancy appears to be related to negative outcomes for the mother and the foetus[10–12], such as preterm birth [13,14].

Women who are pregnant for the first time may also experience anxiety symptoms during pregnancy. Overall, about 7.5% of pregnant women experience a pathological fear of childbirth (FoC)[15,16]. FoC has been found in both nulliparous women who did not experience childbirth before (*primary* fear of childbirth,), as well as in multiparous women (women with a previous birth, whether one or more) in whom a negative or traumatic previous childbirth experience often plays a role (*secondary* fear of childbirth)[17,18]. Therefore, it is to be expected that (subclinical) PTSD is accompanied by FoC. FoC appears to be more common in nulliparous women compared to multiparous women[19]. Several studies found that the concept of FoC is multifaceted, including - but not limited to - fear of pain, the baby dying or being handicapped, loneliness, lack of support, or being concerned, or embarrassed about, one's own appearance while giving birth[20,21]. Women with FoC may attempt to avoid pregnancy or even decide to terminate the pregnancy, or request (and receive) a caesarean section[22,23]. Moreover, FoC has been found to be associated with increased risk of emergency caesarean section[24], and a six-fold increased risk of PTSD following childbirth[16].

Prevalence rates of women avoiding pregnancy because of posttraumatic stress symptoms after previous childbirth or fear of childbirth are unknown. Avoidance symptoms can result in avoiding conversations with healthcare providers about childbirth-related mental health problems, such that even women with the most severe symptoms might not be noticed. Awareness among healthcare providers and women themselves, and an available effective treatment may help to improved quality of life for them and their partners.

Therapeutic attitudes and practice

Fear of Childbirth

Related to fear of childbirth, a small number of intervention studies have been published, of which a few are controlled trials, and only three were randomized controlled trials (RCT)[25–27]. In 2001, 176 pregnant women were randomized between conventional and intensive therapy[26]. Conventional therapy included routine obstetric appointments, standard distribution of written information about pain relief and pros and cons of vaginal delivery versus caesarean section. In the intensive therapy group, appointments were combined with cognitive therapy, and additive informative appointments were recommended. In the intensive therapy group, birth concerns and anxiety were more reduced compared to the conventional group, and labour duration was shorter (mean ± standard deviation; 6.8±3.8 hours, compared to the conventional group 8.5±4.8 hours, p=0.04). In both groups the amount of requests for elective caesarean was decreased with no difference between the groups. In a randomized controlled trial among nulliparae with severe fear of childbirth, participating in group psycho-education in combination with relaxation, exercises resulted in a more positive childbirth experience (36.1% versus 22.8%, p=0.04), and decreased postpartum depressive symptoms (mean sum score 6.4±5.4 versus 8.0 ± 5.9, p=0.04)[25,28]. The number of uncomplicated vaginal deliveries was significantly higher among women in the intervention group than among the controls (63.4% versus 47.5%, p<0.01) who received care by community nurses and were referred in case this was considered necessary. Because complications lead to more medicals costs, a greater number of uncomplicated deliveries reduced medical costs in the intervention group, resulting in group psycho-education being cost-neutral[29]. In another RCT a telephone psycho-education counselling intervention offered by midwives for 189 pregnant women with fear of childbirth was found to be significantly more effective regarding the reduction of childbirth fear levels than care-as-usual (clinically meaningful improvement in fear of childbirth in 49% versus 26%, p=0.002)[27]. A non-randomized controlled trial among 106 pregnant women showed that women who received counselling for fear of childbirth by a team of specialized midwives were satisfied with the counselling they received during their pregnancy[30]. However, postpartum these women also indicated having had significantly more negative delivery experience compared to the control group (44.3±20.5 versus 29.7±17.4, p<0.01). They also reported posttraumatic stress symptoms more frequently than a matched sample of women from the general parturient population (19% versus 2%). In conclusion, treatment of

Fear of Childbirth can lead to a reduction in anxiety, shorter labour duration, and a greater likelihood of uncomplicated vaginal childbirth. Results about the impact of treatment of Fear of Childbirth on childbirth experience are contradictory, and negative effects on posttraumatic stress symptoms have been described[30]. However, the amount of previous results, and in specific RCT's, is scarce.

A disproportionate fear of childbirth with a level of symptoms meeting the DSM-5 criteria for specific phobia is often referred to as tocophobia[4].Cognitive behavioral therapy, particularly in vivo exposure, is generally considered to be the treatment of choice for specific phobias[31,32]. However, because in vivo exposure is hardly possible for women with fear of childbirth, and the fact that EMDR therapy has been found to be effective for a wide variety of specific phobia subtypes[33–35], this may be a promising alternative. Thus far, controlled studies using EMDR therapy among pregnant women with fear of childbirth are lacking.

Posttraumatic Stress Disorder after Childbirth

Since EMDR therapy can be used to treat PTSD resulting from a wide range of traumatic events, it is unlikely that the effectiveness would differ when the traumatic event is childbirth. There are some indications that EMDR therapy is experienced as less intensive than prolonged exposure therapy by the patients: patients are distracted during therapy, and that there is a faster reduction in symptoms compared to other treatments[36,37]. However, research about treating PTSD following childbirth is limited to some small uncontrolled trials[38], and even less is known about the benefits and risks of treatment during subsequent pregnancy. Only two small, uncontrolled studies with respectively four women (of which 1 pregnant)[39], and three pregnant women[40] provide some preliminary support for the notion that EMDR therapy can be safe and effective for PTSD following childbirth. A pilot study with four women (of which one pregnant), who fulfilled DSM-IV criteria for PTSD, received an unknown number of EMDR therapy sessions[39]. Posttraumatic stress symptoms were reduced (mean score TES 52.7 before, 33.5 after treatment, 22.7 at follow-up), and two participants who completed the follow-up measurements no longer fulfilled the DSM-IV criteria for PTSD after treatment. In a case series three pregnant women with PTSD-symptoms received one or two EMDR therapy sessions followed by a closing session or another three sessions EMDR therapy for different distressing events[40]. It was found that despite several medical complications, their PTSD symptoms decreased, confidence in the upcoming delivery improved, and that they evaluated their subsequent delivery experience positively. In conclusion, preliminary results show that treatment of childbirth-related PTSD during subsequent pregnancy using EMDR can lead to a reduction in symptoms. Randomized research, with validated questionnaires is needed.

Yet, it should be noted that the fact that patients are still continuously confronted with the prospect of the upcoming and inevitable delivery might complicate the condition and treatment. This could easily lead to clinicians being reluctant to offer any treatment at all.

In addition, clinicians might be afraid that trauma-focused therapy during pregnancy could provoke a stress response with negative effects on the mother or the foetus. On the other hand, it could be argued that untreated PTSD results in a continuously overactive stress system, which may lead to complications during pregnancy. Furthermore, PTSD is known to have a potentially negative influence on mother-child bonding and the relationship of the mother with her partner[41].

Objectives

Our main objective is to assess the safety and efficacy of EMDR therapy for pregnant women with PTSD after previous childbirth or fear of childbirth. The following hypotheses are tested:

Posttraumatic Stress Disorder

Within the treatment group we expect a significant reduction of the severity of PTSD symptoms and percentage of PTSD diagnoses present following EMDR therapy. We expect a significantly larger reduction in PTSD symptom severity and a significantly lower percentage of PTSD diagnoses in the treatment group after completion of the EMDR sessions, compared to the care as usual group (CAU). Furthermore, we predict a significantly lower percentage of caesarean sections (both elective and unplanned), a significantly more positive childbirth experience, and significantly lower health care costs in the treatment group.

Fear of Childbirth

Within the treatment group we expect a significant reduction in fear of childbirth symptoms following EMDR therapy, a significantly larger reduction in fear of childbirth symptoms, a significantly lower percentage of caesarean sections (elective and unplanned), lower health care costs, and a more positive childbirth experience in the treatment group, as compared to the care as usual group.

Not least importantly, in both arms we do not predict EMDR therapy to lead to significantly more obstetric or neonatal complications than care as usual.

DESIGN/METHODS

Participants

Participants eligible for screening for the OptiMUM-study are women with a gestational age of 8-20 weeks, who master the Dutch language (written and spoken). Exclusion criteria are age <18 years old, current psychological treatment, intermediate or high suicide risk (based upon MINI-PLUS), or severe psychotic disorder, such as schizophrenia or current psychosis (based upon MINI-PLUS). Participants are recruited from one university hospital, two teaching hospitals and several community midwifery practices in Amsterdam, the Netherlands..

Design

Patients will be randomized to either the EMDR therapy group or care-as-usual group on a 1:1 basis by block randomization. The randomization is done by an independent computer program. Fear of childbirth and PTSD after childbirth have their own randomization program, and therefore can be seen as two separate randomized controlled trials with overlapping design (see Figure 1). The randomization procedure will not balance sites, and no other stratification variables are used since there are no prognostics factors known regarding EMDR response among pregnant women. The study was approved by The Medical research Ethics Committee of the OLVG Hospital, and is registered as NL4930410014 and NL4930510014. The study is registered prospectively in the Dutch trial register (**www.trialregister.nl**) as NTR5123 and NTR5122**.**

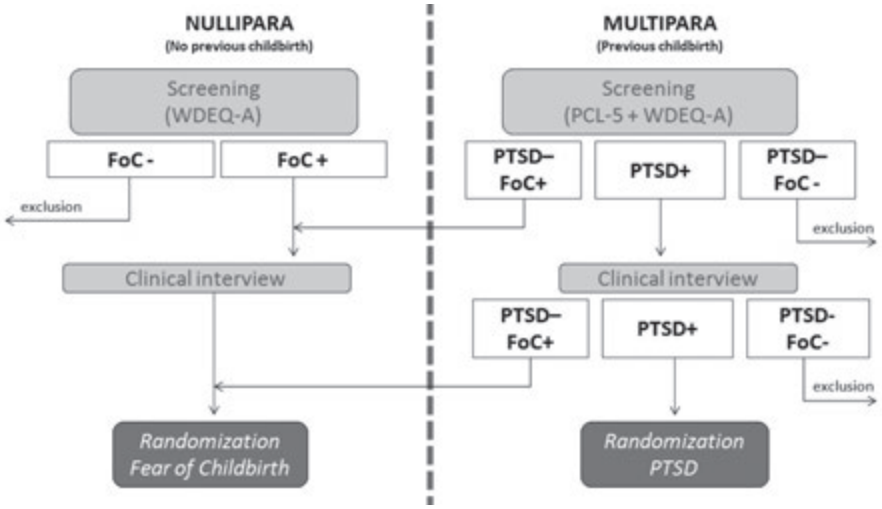


Figure 1. Procedure of inclusion
WDEQ-A: Wijma Delivery Expectations/Experience Questionnaire; PCL-5: PTSD Checklist for DSM-5; FoC: Fear of Childbirth; PTSD: Posttraumatic Stress Disorder

Intervention

Participants will be randomized to either EMDR therapy or care-as-usual.

EMDR therapy group (fear of childbirth: n=60; PTSD: n=25)

The EMDR therapy group will receive a maximum of three 90-minute sessions, in addition to standard care during pregnancy. EMDR is a psychological intervention that has been developed for the treatment of traumatic memories[42]. It is internationally recognized as a first choice therapy for treating posttraumatic stress disorder[43,44]. EMDR therapy will be applied according to the Dutch translation of the standard EMDR protocol. The standardized procedure involves a combination of 1) focusing on the most distressing images of the traumatic event (or in case of fear of childbirth: worst-case scenario), including corresponding emotions, cognitions and physical response, and 2) repeated series of eye movements as a bilateral stimulation, followed by free associations. Current distress is rated until the distress level is (as close to) zero, after which a positive cognition is introduced corresponding to the image. The hypothesis is the traumatic event is unprocessed. By taxing patient's working memory by both the image and eye movements simultaneously, the memory is reconsolidated less vividly. All therapy sessions will be videotaped. Tapes will be scored to determine treatment fidelity by using the EMDR Fidelity Scale[45].

Care-as-usual group (fear of childbirth: n=60; PTSD: n=25)

Care-as-usual is defined as standard care during pregnancy, with routine obstetrical checks. Assuming good clinical care, anxious pregnant women and those with traumatic childbirth experiences may receive more counselling compared to not-anxious pregnant women, but will (probably) not be referred for EMDR therapy. Type and frequency of any form of professional care will be registered.

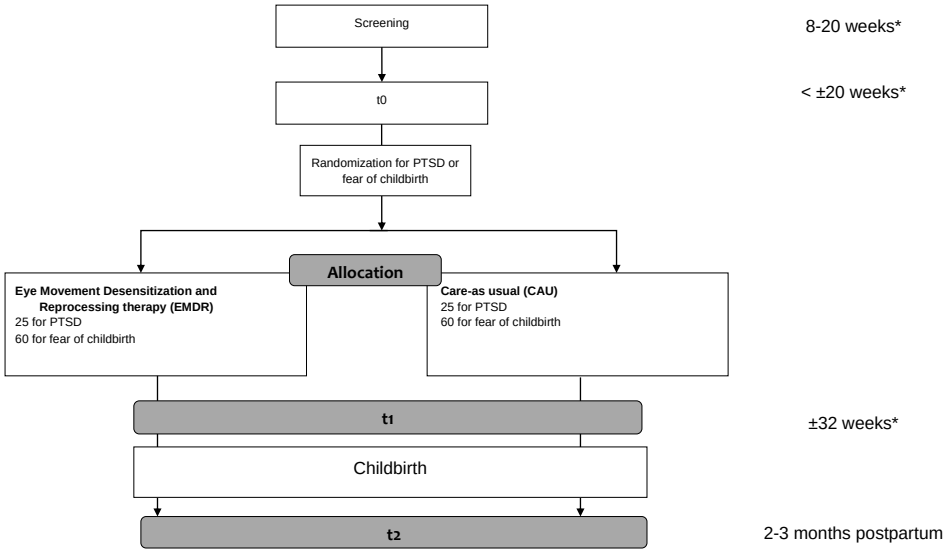
Procedure

Women with a gestational age between 8 and 20 weeks, regardless of parity, who score above the cut-off score of the Wijma Delivery Expectations Questionnaire (WDEQ-A) at time of screening will be invited for a clinical interview. In case of multiparity, the PTSD Checklist for DSM-5 (PCL-5) is administered at time of screening in addition.

During the clinical interview, traumatic events are explored in all women with the Life Events Checklist (LEC-5). If appropriate, subsequently The Clinician Administered Posttraumatic Stress Disorder Scale (CAPS) will be administered to diagnose PTSD (childbirth related, or not). In case of several traumatic events, the CAPS will be administered for each event separately. A pregnant women is eligible for randomization for PTSD when a PTSD diagnosis can be obtained using the CAPS, with previous childbirth being the index trauma. PTSD with index trauma other than childbirth will be registered and analyzed as co-existing psychiatric disorder. When informed consent is obtained, computer-assisted randomization will take place to allocate participants to either EMDR therapy or care-as-

usual (CAU). If the woman does not meet the criteria for PTSD after previous childbirth, but does score above cut-off on the WDEQ-A, she is eligible to be randomized for fear of childbirth (FoC) (Figure 1). Measurements of (PTSD and/or FoC) symptoms take place between sessions (with childbirth being the index event of the PSS-SR questionnaire): at the start of each therapy session, or in case of care-as-usual, measurements are done two, four and six weeks after randomization by email. Post-treatment antepartum measurement takes place at about 32-34 weeks of gestational age by a blinded assessor. If there is unblinding during the interview, another assessor will finish the interview. Final follow-up takes place two to three months after childbirth. Perinatal healthcare providers are semi-blinded: randomization results are not send to the professionals, but if a pregnant woman would like to share information with her healthcare provider it is not prohibited.

A limitation for recruitment until 20 weeks gestation has been chosen to ensure that there is enough time for planning an interview, arranging for therapy logistics, and for scheduling three therapy sessions before posttreatment sessions will take place around 32-34 weeks gestation.



*duration of pregnancy

Figure 2. Study design

Instruments

The order in which the instruments are administered can be seen in Table 1. The following instruments are used:

PTSD Checklist for DSM-5 (PCL-5)[46,47]**:** the PCL-5 is the DSM-5 version of the PCL. The PCL-5 is a 20-item self-report questionnaire assessing the 20 symptoms of PTSD according to DSM-5. Participants are asked to rate the severity of PTSD symptoms in the past month on a five points scale from 0 ("Not at all") to 4 ("extremely"). Women meet the cut-off value when they report symptoms in accordance with the DSM-5 criteria: each item rated 2 ("Moderately") or higher counts as a symptom, in addition at least 1 B item (questions 1-5), 1 C item (questions 6-7), 2 D items (questions 8-14) and 2 E items (questions 15-20) are required to meet the cut-off. Initial psychometric evaluation showed a strong internal consistency (.94)[48].

PTSD Symptom Scale (PSS-SR)[49]**:** the PSS-SR is a 17-item self-report version of the semi-structured questionnaire to assess symptoms of PTSD in the past week. Items are scored on a 4-point scale from 0 ("not at all"/"only one time") to 3("almost always"/"five or more times a week"). Psychometric properties are good, with internal consistency and test-retest reliability being .91 and .74, respectively[49].

Life Events Checklist (LEC-5)[50]: the LEC-5 is a self-report questionnaire to screen for potentially traumatic events during one's life. Sixteen events which are known for their potential to cause PTSD, and one additional item for other extreme events are assessed. In our study it is used to identify the index traumatic event for administration of the CAPS-5.

Clinician-Administered PTSD Scale (CAPS-5)[51–53]: the CAPS-5 is the gold standard for diagnosing PTSD. It is a structured interview comprising 30-items including all 20 DSM-5 PTSD symptoms. Per item a severity rating is calculated by combining information about frequency and intensity. For DSM-5 PTSD diagnosis, a symptom is considered present when severity score is rated 2 ("moderate") or higher (range 0-4). Following DSM-5 criteria, 1B, 1C, 2D, 2E-criteria are required. Research on the psychometric properties of the Dutch translation of CAPS-5 is currently being conducted, but the internal consistency of the Dutch CAPS-IV was good, ranging from .63 to .79 for clusters, to .89 overall[54].

Mini International Neuropsychiatric Interview – Plus (MINI-PLUS)[55]**:** the MINI-plus is a structured interview for axis I DSM-IV conditions. In the current study, it is used to evaluate comorbidity, among which are mood disorders (i.e., major depressive episode, manic episode), anxiety disorders (i.e.. panic disorder, specific phobia), substance abuse (alcohol, drugs), and psychotic disorders. Each chapter starts with one or more screening questions, and, if positive, is followed by further exploration before a specific diagnosis is made. There is a reasonable to good concurrent validity.

Hospital Anxiety and Depression Scale (HADS)[56]: the HADS is a 14-item self-report questionnaire with a two-factor structure to measure anxiety and depressive symptoms. Each item is scored from 0 -3. Each subscale had a cut-off level of ≥8 for clinical significance. Internal consistency of the total scale and both subscales is found to be good (range 0.71-0.9)[57].

Satisfaction Scale: Satisfaction around pregnancy and delivery is measured by the question "how satisfied are you about your pregnancy", and "how satisfied are you about your delivery" on a 10-point scale, where 0 equals extremely unsatisfied, and 10 extremely satisfied.

Wijma Delivery Expectations/Experiences Questionnaire (WDEQ-A/B)[58]: the WDEQ is a 33-item self-report questionnaire assessing Fear of Childbirth during pregnancy (version A), and after delivery (version B) in terms of the woman's cognitive appraisal of childbirth. It was designed as a monofactorial scale, all 33 items being scored on a 6-point scale leading to a sum score between 0-165, with higher score equaling more fear of childbirth. The WDEQ can be dichotomized to conclude if there is Fear of Childbirth or not (cut-off ≥85). Internal consistency is found to be high (≥0.87)[58].

Table 1 *Timing of instruments*

				In between sessions		t1		t2	
		Screening	**t0**	**EMDR**	**CAU**	**EMDR**	**CAU**	**EMDR**	**CAU**
Instruments									
Clinical interview									
CAPS(+LEC-5)		-	x*	-	-	x*	x *	-	-
M.I.N.I-Plus		-	x	-	-	x	x	-	-
Self-report questionnaires									
PCL-5		x	-	-	-	-	-	-	-
PSS-SR*		-	x	x	x	x	x	x	x
HADS		-	x	-	-	x	x	x	x
Satisfaction Scale		-	-	-	-	-	-	x	x
WDEQ	version A	x	-	x	-	x	x	-	-
	version B	-	-	-	-	-	-	x	x

Note. CAPS: Clinician-Administered PTSD Scale; CAU: care-as-usual; EMDR: Eye Movement Desensitization and Reprocessing Therapy; HADS: Hospital Anxiety and Depression Scale; LEC-5: Life Events Checklist; M.I.N.I.-plus: M.I.N.I. International Neuropsychiatric Interview-Plus; PCL-5: PTSD Checklist for DSM-5; PSS-SR: PTSD Symptom Scale; PTSD: Posttraumatic Stress Disorder; WDEQ-A/B: Wijma Delivery Expectations/Experiences Questionnaire
*only if experienced a traumatic event

Interrater reliability and treatment fidelity

All clinical interviewers receive an official training in assessment of the MINI and CAPS. Interrater reliability of assessment of the clinical interviews (MINI, CAPS) will be measured by scoring interviews by two independent assessors, or group wise scoring video tapes. Interrater reliability will be enhanced by supervision of each clinical interview.

All four therapists are psychologists with a postdoctoral degree in Psychology. They are not part of the research team, and work at different sites. They have completed the basic and advanced EMDR training course accredited by the Dutch National EMDR Association (www.emdr.nl), and have at least one year experience with providing EMDR therapy. Patients will be randomly and equally distributed among therapists. All therapy sessions will be videotaped, and a selection will be rated for treatment fidelity. Group supervision every three to four months is obligatory for all therapists during the whole study duration. After each first session with a new patient, a case conceptualization will be emailed for supervision, including: the story of the traumatic event, with a hierarchy of the most relevant traumatic moments (targets) regarding to the current impairment. Deviations from protocol will be noted and reported.

The reliability of medical record data will be ascertained by double data entry of 20% of all records, and there is a build-in quality check in the data entry system.

Sample size

The main treatment outcomes of the current study are the effectiveness of EMDR therapy for treating PTSD and fear of childbirth. In practice, this corresponds to the difference in total CAPS or WDEQ scores between the EMDR and care-as-usual group at follow-up during pregnancy. In both cases, a significance level of 0.05 and power of 80% is used. An one-sided significance level is chosen according with our hypothesis to find a reduction in PTSD or FoC symptoms. For PTSD, expecting a large effect size of at least 0.8[59], this results in 21 patients needed per group. The sample size was set at 25 patients each group, calculating for 20% patient attrition. For fear of childbirth, EMDR therapy effect size is not known yet. The most comparable data is EMDR therapy for dental phobia, which showed a large effect size[34]. We estimated a medium effect size of 0.5, which results in 50 patients needed per group. With 20% patient attrition, this leads to a requirement of two groups of 60 patients for fear of childbirth.

Statistical analyses

Descriptive statistics will be used to evaluate demographic, clinical (obstetrical and psychological) baseline characteristics of both arms. All data will be analyzed according to intention to treat analysis: the data of all randomized subjects will be analyzed using the groups (treatment vs. care as usual) as defined at randomization. In both conditions symptoms will be measured at regular intervals, in order to monitor treatment results over time. The treatment group and care-as-usual group will be compared on all outcomes,

which will be analyzed with Linear Mixed Models (LMM). Baseline scores will be included as covariates, time as a categorical variable, and treatment condition as a fixed effect. The intercept will be treated as a random effect. Furthermore, we will use Chi-squared tests and independent t-tests to compare both treatment conditions at different times (alpha level 0.05), or Fisher's Exact test and Mann-Whitney U-test when appropriate. Effect sizes from change in symptoms between baseline and post-treatment antepartum, and post-treatment postpartum will be calculated with Cohen's d. Safety is objectified by measuring worsening of FoC/PTSD symptoms, neonatal and obstetrical outcomes, dropout, and determining the presence of adverse events. However, our study is not powered upon these safety measures, therefore this outcome will be shown descriptively.
All analyses will be performed using statistical software (SPSS 22.0).

Cost-effectiveness analysis

A cost-effectiveness analysis by a societal perspective will be performed, including a sensitivity analysis. All costs in maternal care during pregnancy, delivery and the first three months postpartum will be collected. This includes direct costs (e.g., visits to primary healthcare and obstetric hospital services, procedures, medication, and maternal admission), but also indirect costs (e.g., prolonged maternity leave, partner taking days off). Also, self-reported costs made by the patient will be collected (e.g., alternative medicine, antenatal courses). In addition, neonatal admission costs will be included. As far as possible, true costs will be collected besides using the Dutch system of hospital pricing that is based on diagnosis and procedure codes. Information will be derived from obstetric patient records, and the postpartum questionnaire that includes questions about healthcare use and additional costs.

DISCUSSION

The OptiMUM-study has several strengths resulting in a potentially innovative study. Firstly, it is a randomized controlled trial which will provide answers in a patient population where research is scarce. Secondly, the present study is a large study, comprising inclusion in university and teaching hospitals, but also in community midwifery practices. This will result in a decent cross-section of the population and including women with low, medium and high risk pregnancies. Also, PTSD and psychological comorbidity will be assessed with validated clinical interviews, which is an added value compared to many previous studies using self-report questionnaires[25–27]. Furthermore, besides effectiveness, obstetric and neonatal outcome is taken into account. This may be an important contribution since our study is the first controlled-study with an intervention for PTSD during pregnancy instead of postpartum. Finally, cost-effectiveness analysis is added to this study. As we expect symptoms of PTSD or fear of childbirth to decrease as a result of EMDR therapy, it is likely that costs of treatment are well compensated by prevented caesarean section and less complications. Particularly, because costs of EMDR therapy are relatively low compared to costs of medical complications.

There are several limitations to be expected. Comparing EMDR with care-as-usual is a compromise, since there is no gold standard intervention during pregnancy. Adding a waitlist-control condition was not possible, since childbirth characteristics are the outcome measures in this study. The same holds true for a placebo-intervention group due to limited financial resources at the start of this study. We estimate the influence of more patient-professional contacts (6.5 hours instead of 2 hours) for the EMDR-group as a small confounding factor. It is also possible that patients in the care-as-usual group will search for professional help as a result of the screening procedure for this study, which potentially could raise awareness about their PTSD symptoms or fear of childbirth. Data about all types of treatments followed by patients (in both groups) is collected. Lastly, while prevalence rates of PTSD after childbirth are known, it is however unknown how many of those women will have a subsequent pregnancy.

If EMDR therapy proves to be safe and effective during pregnancy in treating PTSD after childbirth and fear of childbirth, these are strong arguments for standard screening pregnant women for these psychological conditions, and to refer them for treatment in an early phase of pregnancy.

Acknowledgements and funding

The OptiMUM-study is supported by grants from the Stichting EMDR Nederland (Dutch EMDR Association), Stichting Teaching Hospital, Fonds Gezond Geboren and Stichting Wetenschap OLVG, all awarded to the principal investigator MG van Pampus. We thank our clinical interviewers, therapists, local researchers, independent physician, and all midwives and obstetrician-gynaecologists who aided in making this study possible. Finally, we thank and respect all women who participated in this study.

REFERENCES

1. Vesga-López O, Blanco C, Keyes K, Ofson M, Grant BF, Hasin DS. Psychiatric disorders in pregnant and postpartum women in the United States. Arch Gen Psychiatry. 2008;65(7):805–15.
2. Alcorn KL, O'Donovan A, Patrick JC, Creedy D, Devilly GJ. A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. Psychol Med. 2010;40(11):1849–59.
3. Grekin R, O'Hara M. Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. Clin Psychol Rev. 2014;34(4):389–401.
4. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.
5. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016 Apr 16;46(06):1121–34.
6. Stramrood CAI, Wessel I, Doornbos B, Aarnoudse JG, van den Berg PP, Schultz WC, et al. Posttraumatic stress disorder following preeclampsia and PPROM: a prospective study with 15 months follow-up. Reprod Sci. 2011;18(7):645–53.
7. Söderquist J, Wijma B, Wijma K. The longitudinal course of post-traumatic stress after childbirth. J Psychosom Obstet Gynaecol. 2006;27(2):113–9.
8. Fuglenes D, Aas E, Botten G, Øian P, Kristiansen IS. Why do some pregnant women prefer cesarean? The influence of parity, delivery experiences, and fear. Am J Obstet Gynecol. 2011;205(1):45–9.
9. Gottvall K, Waldenström U. Does a traumatic birth experience have an impact on future reproduction? Br J Obstet Gynaecol. 2002;109(3):254–60.
10. Alder J, Fink N, Bitzer J, Hösli I, Holzgreve W. Depression and anxiety during pregnancy: A risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. J Matern Neonatal Med. 2007;20(3):189–209.
11. Seng JS, Oakley DJ, Sampselle C., Killion C, Graham-Bermann S, Liberzon I. Posttraumatic stress disorder and pregnancy complications. Obstet Gynecol. 2001;97(1):17–22.
12. Seng JS, Low L, Sperlich M, Ronis D, Liberzon I. Post-traumatic stress disorder, child abuse history, birthweight and gestational age: a prospective cohort study. BJOG. 2011;118(11):1329–39.
13. Yonkers KA, Smith MV, Forray A, Epperson CN, Costello D, Lin H, et al. Pregnant women with posttraumatic stress disorder and risk of preterm birth. JAMA Psychiatry. 2014;71(8):897–904.
14. Shaw J, Asch S, Kimderlin R, Frayne S, Shaw K, Phibbs C. Posttraumatic stress disorder and risk of sponteaneous preterm birth. Obstet Gynecol. 2014;124(6):1111–9.
15. Adams SS, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: A study of 2206 women with intended vaginal delivery. Br J Obstet Gynaecol. 2012;119:1238–1246.
16. Söderquist J, Wijma B, Thorbert G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. Br J Obstet Gynaecol. 2009;116(5):672–80.
17. Hofberg K, Ward MR. Fear of pregnancy and childbirth. Postgrad Med J. 2003;79(935):505–10.
18. Størksen HT, Garthus-Niegel S, Vangen S, Eberhard-Gran M. The impact of previous birth experiences on maternal fear of childbirth. Acta Obstet Gynecol Scand. 2013;92(3):318–24.

19. Rouhe H, Salmela-Aro K, Halmesmäki E, Saisto T. Fear of childbirth according to parity, gestational age, and obstetric history. Br J Obstet Gynaecol. 2009;116(1):67–73.

20. Garthus-Niegel S, Størksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol. 2011;32(3):160–3.

21. Huizink AC, Mulder EJ, Robies de Medina PG, Visser GH, Buitelaar JK. Is pregnancy anxiety a distinctive syndrome? Early Hum Dev. 2004;79(2):81–91.

22. Raïsanen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. Br J Obstet Gynaecol. 2014;121(8):965–70.

23. Størksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective caesarean section: a population-based study. BMC Pregnancy Childbirth. 2015;17(15):221.

24. Ryding EL, Wijma B, Wijma K, Rydhström H. Fear of childbirth during pregnancy may increase the risk of emergency cesarean section. Acta Obstet Gynecol Scand. 1998;77(5):542–7.

25. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Ryding EL, et al. Group psychoeducation with relaxation for severe fear of childbirth improves maternal adjustment and childbirth experience – a randomised controlled trial. J Psychosom Obstet Gynaecol. 2015;36(1):1–9.

26. Saisto T, Salmela-Aro K, Nurmi JE, Könönen T, Halmesmäki E. A randomized controlled trial of intervention in fear of childbirth. Obstet Gynecol. 2001;89(5):820–6.

27. Toohill J, Fenwick J, Gamble J, Creedy DK, Buist A, Turkstra E, et al. A Randomized Controlled Trial of a Psycho-Education Intervention by Midwives in Reducing Childbirth Fear in Pregnant Women. Birth. 2014;41(4):384–94.

28. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Obstetric outcome after intervention for severe fear of childbirth in nulliparous women - randomised trial. Br J Obstet Gynaecol. 2013;120(1):75–84.

29. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Life satisfaction, general well-being and costs of treatment for severe fear of childbirth in nulliparous women by psychoeducative group or conventional care attendance. Acta Obstet Gynecol Scand. 2015;94(5):527–33.

30. Ryding EL, Persson A, Onell C, Kvist L. An evaluation of midwives' counseling of pregnant women in fear of childbirth. Acta Obstet Gynecol Scand. 2003;82(1):10–7.

31. Barlow DH, Allen LB, Basden SL. Psychological treatments for panic disorders, phobias, and generalized anxiety disorder. In: Nathan PE, Gorman JM, editors. A Guide to Treatments That Work. 3rd ed. New York: Oxford University Press; 2007. p. 351.

32. Wolitzky-Taylor KB, Horowitz JD, Powers MB, Telch MJ. Psychological approaches in the treatment of specific phobias: a meta-analysis. Clin Psychol Rev. 2008;28(6):1021–2037.

33. De Jongh A, Ten Broeke E, Renssen MR. Treatment of specific phobias with Eye Movement Desensitization and Reprocessing (EMDR): Protocol, empirical status, and conceptual issues. J Anxiety Disord. 1999;13:68–85.

34. Doering S, Ohlmeier MC, de Jongh A, Hofmann A, Bisping V. Efficacy of a trauma-focused treatment approach for dental phobia: a randomized clinical trial. Eur J Oral Sci. 2013;121(6):584–93.

35. De Jongh AD, Holmshaw M, Carswell W, van Wijk A. Usefulness of a trauma-focused treatment approach for travel phobia. Clin Psychol Psychother. 2011;18(2):124–37.

36. Ho MSK, Lee CW. Cognitive behaviour therapy versus eye movement desensitization and reprocessing for post-traumatic disorder–is it all in the homework then? Rev Eur Psychol Appliquée. 2012;62(4):253–60.

37. Nijdam MJ, Gersons BPR, Reitsma JB, de Jongh A, Olff M. Brief eclectic psychotherapy v. eye movement desensitisation and reprocessing therapy for post-traumatic stress disorder: randomised controlled trial. Br J Psychiatry. 2012;200(3):224–31.

38. Lapp LK, Agbokou C, Peretti CS, Ferreri F. Management of post traumatic stress disorder after childbirth: a review. J Psychosom Obstet Gynaecol. 2010;31(3):113–22.

39. Sandström M, Wiberg B, Wikman M, Willman AK, Högberg U. A pilot study of eye movement desensitisation and reprocessing treatment (EMDR) for post-traumatic stress after childbirth. Midwifery. 2008;24(1):62–73.

40. Stramrood CAI, Van der Velde J, Doornbos B, Paarlberg KM, Weijmar Schultz WC, Van Pampus MG. The patient observer: eye-movement desensitization and reprocessing for the treatment of posttraumatic stress following childbirth. Birth. 2012;39(1):70–6.

41. Ayers S, Eagle A, Waring H. The effects of childbirth related post-traumatic stress disorder on women and their relationships: A qualitative study. Psychol Health Med. 2006;11(4):389–98.

42. Oren E, Solomon R. EMDR therapy: An overview of its development and mechanisms of action. Eur Rev Appl Psychol. 2012;62(4):197–203.

43. NICE. Post-traumatic Stress Disorder (PTSD): the Treatment of PTSD in Adults and Children. Understanding NICE guidance. NICE, editor. London; 2005.

44. WHO. Guidelines for the management of conditions that are specifically related to stress. Geneva: World Health Organization; 2013.

45. Korn DL, Zangwill W, Lipke H, Smyth NJ. EMDR fidelity scale. EMDRIA, editor. Texas; 2001.

46. Boeschoten MA, Bakker A, Jongedijk RA, Olff M. PTSD Checklist for DSM-5– Dutch Version. Arq Psychotrauma Expert Groep, editor. Diemen; 2014.

47. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD at www.ptsd.va.gov; 2013.

48. Blevins C, Weathers F, Davis M, Witte T, Domino J. The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. J Trauma Stress. 2015;28(6):489–98.

49. Foa EB, Cashman L, Jaycox L, Perry K. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. Psychol Assess. 1997;9:445–51.

50. Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane T. The Life Events Checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD at www.ptsd.va.gov; 2013.

51. Blake DD, Weathers FW, Nagy LM. The development of a Clinician administered PTSD Scale. J Trauma Stress. 1995;8:75–90.

52. Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. The clinician-Administered PTS Scale for DSM-5 (CAPS-5). Interview available from the National Center for PTSD at www.ptsd.va.gov; 2013.

53. Boeschoten MA, Bakker A, Jongedijk RA, van Minnen A, Elzinga BM, Rademaker AR, et al. Clinician Administered PTSD Scale for DSM-5 – Dutch version. Arq Psychotrauma Expert Groep, editor. Diemen; 2014.

54. Hovens J, Van der Ploeg, H. Klaarenbeek M, Bramsen I, Schreuder J, Rivero V. The assessment of posttraumatic stress disorder: With the clinician administered PTSD scale: Dutch results. J Clin Psychol. 1994;50:325–340.

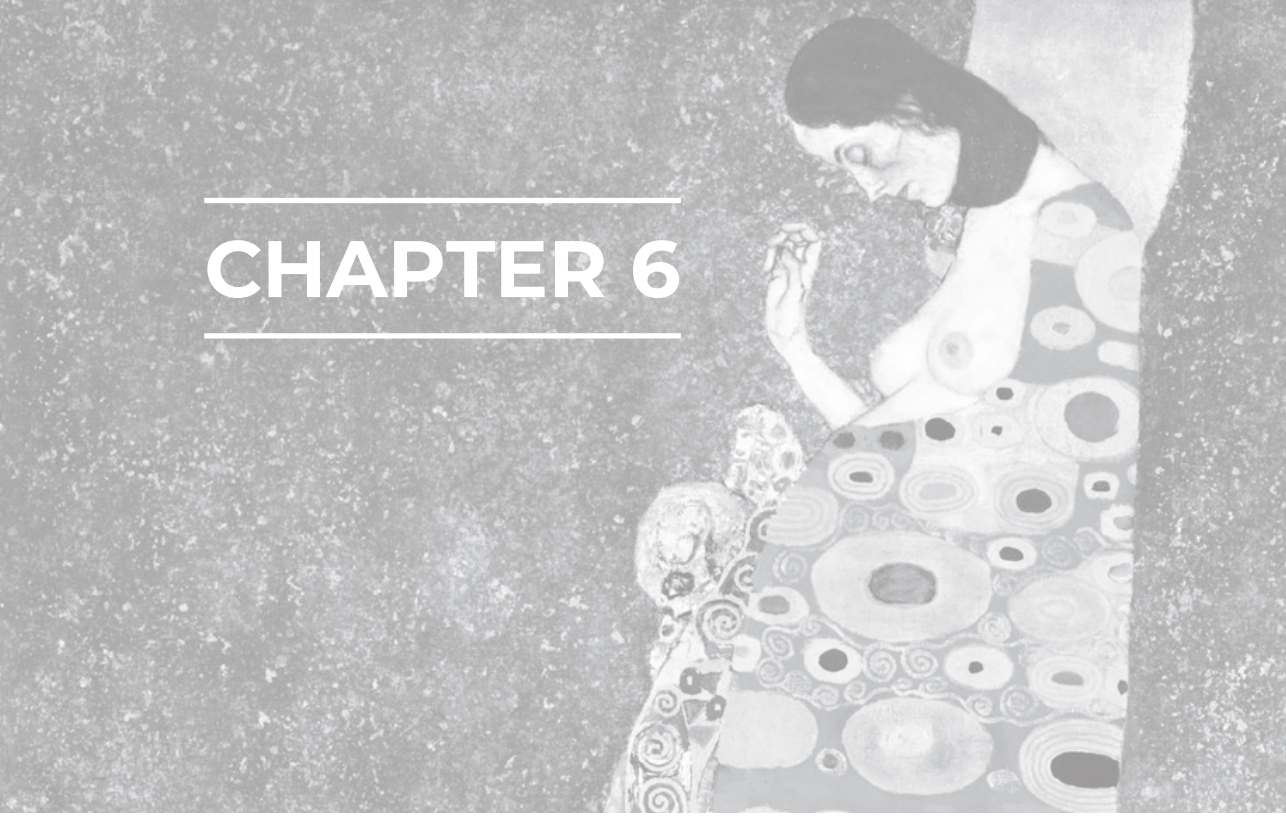
55. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 1998;59:34–57.

56. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361–70.

57. Spinhoven P, Ormel J, Sloekers P, Kempen G, Speckens A, Van Hemert A. A validation study of the Hospital anxiety and depression scale (HADS) in different groups of Dutch subjects. Psychol Med. 1997;27:363–370.

58. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84–97.

59. Gerger H, Munder T, Gemperli A, Nüesch E, Trelle S, Jüni P, et al. Integrating fragmented evidence by network meta-analysis: relative effectiveness of psychological interventions for adults with post-traumatic stress disorder. 2014. Psychol Med. 2014;44(15):3151–64.



CHAPTER 6

Treatment of pregnant women with Fear of Childbirth using EMDR therapy: results of a multi-centre randomized controlled trial

Baas MAM, van Pampus MG, Stramrood CAI, Dijksman, LM, Vanhommerig JW, de Jongh A. Treatment of pregnant women with Fear of Childbirth using EMDR therapy: results of a multi-centre randomized controlled trial. Front. Psychiatry 12:798249. doi: 10.3389/fpsyt.2021.798249

ABSTRACT

Fear of Childbirth (FoC) occurs in 7.5% of pregnant women and has been associated with adverse foeto-maternal outcomes. Eye Movement Desensitization and Reprocessing (EMDR) therapy has proven to be effective in the treatment of posttraumatic stress disorder (PTSD) and anxiety, however, its effectiveness regarding FoC has not yet been established. The aim was to determine the safety and effectiveness of EMDR therapy for pregnant women with FoC.

This single-blind RCT (the OptiMUM-study, www.trialregister.nl, NTR5122) was conducted in the Netherlands. Fear of Childbirth was defined as a score ≥85 on the Wijma Delivery Expectations Questionnaire (WDEQ-A). Pregnant women with FoC and a gestational age between 8 and 20 weeks were randomly assigned to EMDR therapy or care-as-usual (CAU). The severity of FoC was assessed using the WDEQ-A. Safety was indexed as worsening of FoC symptoms, drop-out, serious adverse events or increased suicide risk. We used Linear Mixed Model analyses to compare groups.

141 women were randomized (EMDR n=70; CAU n=71). No differences between groups were found regarding safety. Both groups showed a very large (EMDR *d*=1.36) or large (CAU *d*=.89) reduction of FoC symptoms with a mean decrease of 25.6 (EMDR) and 17.4 (CAU) points in WDEQ-A sum score. No significant difference between both groups was found (p=0.83). At posttreatment 72.4% (EMDR) versus 59.6% (CAU) no longer met the criteria for FoC.

In conclusion, the results are supportive of EMDR therapy as a safe and effective treatment of FoC during pregnancy, albeit without significant beneficial effects of EMDR therapy over and above those of CAU. Therefore, the current study results do not justify implementation of EMDR therapy as an additional treatment in this particular setting.

INTRODUCTION

Severe Fear of Childbirth (FoC), sometimes also referred to as tocophobia[1], affects a relevant proportion of pregnant women (7.5%)[2] and has been found to be associated with adverse maternal and neonatal outcomes. FoC occurs both in women who did not give birth before (nulliparous; primary FoC) and women with at least one previous childbirth (multiparous; secondary FoC). Except for a few studies[3,4], most studies include women regardless of parity, and make no distinction between primary and secondary FoC. Evidence suggests that during pregnancy, FoC may negatively affect the experience of pregnancy and the transition to parenthood[5]. Occasionally, women deny pregnancy and avoid prenatal care, or even decide to terminate their pregnancy[6]. Also, some women with FoC request a caesarean section[7,8]. Furthermore, FoC predisposes women to a negative delivery experience[9], a six-fold increased risk of developing childbirth-related posttraumatic stress disorder (PTSD)[10,11] and an increased risk of postpartum depression[12]. In addition, elevated maternal stress during pregnancy has been associated with negative outcomes such as low birth weight[13] and preterm birth[14].

Several previous studies aimed at determining the effectiveness of interventions for FoC revealed positive treatment outcomes. For example, a randomized controlled trial (RCT) investigating the effects of telephone psycho-education (n=170) by midwives showed a significant reduction of FoC compared to care-as-usual (n=169)[15]. Likewise, an RCT comparing five weekly sessions of motivational interviewing to care-as-usual with a total of 70 women demonstrated significant improvement in the intervention group regarding percentage of women who scored 60 or lower on the WDEQ-A, and a decline in FoC sum score[16]. Another RCT that compared group psycho-education with relaxation or conventional care among 371 women found that psycho-education was associated with a significantly more positive birth experience (WDEQ-B), decreased postpartum depressive symptoms, and more uncomplicated vaginal deliveries than conventional care[3,4]. Lastly, a study among 134 women who were randomly allocated to either haptotherapy, psycho-education via internet, or care-as-usual, showed haptotherapy to be associated with a significant decrease of FoC[17]. However, not all studies showed a significant positive treatment outcome for interventions aimed at reducing FoC. An RCT investigating cognitive therapy added to routine antenatal care among 176 pregnant women did not result in a significant reduction of anxiety, or reduction of requests for elective caesarean sections[18].

It is important to note that adverse effects in women who underwent treatment for FoC have also been described. The results of a non-randomized trial evaluating counselling by specialized midwives, in which women were encouraged to talk about the nature of their fear and previous traumatic childbirth experiences, showed that after 1-14 counselling sessions (mean 4) a significant higher percentage of women experienced a negative childbirth experience and posttraumatic stress symptoms[19]. Another study found

that attending a program for childbirth-related fear was associated with an increased likelihood of caesarean section or a negative birth experience, and were significantly more often fearful one year after giving birth compared to no counselling[20]. More recently, a RCT comparing cognitive therapy to care-as-usual in 282 women showed significantly higher depression and anxiety scores mid-pregnancy after cognitive therapy compared to care-as-usual[21]. Hence, although there are promising results in some studies, research to determine safety and effectiveness of treatment for pregnant women with FoC is still needed.

Eye movement desensitization and reprocessing (EMDR; for a description: https://www.emdria.org/about-emdr-therapy/) therapy[22] is a recommended treatment for PTSD[23,24]. Several case studies and case series found preliminary evidence regarding the safety and effectiveness of EMDR therapy for treating pregnant women diagnosed with PTSD[25–27]. EMDR therapy has also been found to be capable of processing memories of distressing events in a wide variety of other conditions[28] including traumatic triggers of the vomiting in pregnant women with hyperemesis gravidarum[29], which is a pregnancy condition with severe nausea, vomiting, weight loss and dehydration. A recent review concluded that given '*the fact that so far no adverse effects on the unborn child have been reported associated with the application of trauma-focused therapy, treatment of PTSD during pregnancy is most likely safe*'[25]. However, evidence from randomized controlled trials supporting this claim are still lacking; this not only holds true for PTSD, but also for FoC.

The purpose of the present study was to determine the safety and effectiveness of EMDR therapy for pregnant women with FoC. Regarding the safety of the intervention we hypothesized that EMDR therapy would not be associated with a significant increase of symptoms of FoC, more serious adverse events, suicide risk, or a larger drop-out compared to care as usual (CAU). With regard to its effectiveness we hypothesized that EMDR therapy would result in a significantly larger symptom reduction compared to CAU. Moreover, we hypothesized that EMDR therapy would result in a significantly lower percentage of FoC diagnoses compared to CAU at follow-up measurements at 32 weeks gestational age.

MATERIALS AND METHODS

Design

The OptiMUM-study was a single-blinded multi-centre RCT of which the study design has been published previously[30]. The study included two separate RCTs with overlapping design, which differed in diagnosis of the included participants. The results of the first RCT concerning pregnant women with PTSD after previous childbirth has been described as a systematic review and case study elsewhere[25]. The present paper pertains to the RCT concerning pregnant women with FoC. Our registered protocol also included obstetrical outcomes. These outcomes are not included in the current article, but will be reported in

a future publication. The OptiMUM-study was approved by the Medical Research Ethics Committee, and prospectively registered in the Dutch trial register (www.trialregister.nl, NTR5122).

Participants

Pregnant women were recruited during their antenatal consultations in two teaching hospitals and five community midwifery practices in the Netherlands between February 2015 and November 2019. All pregnant women with a gestational age between 8 and 20 weeks were invited to participate in the screening. Inclusion criteria were a sum score on the WDEQ-A of ≥ 85[31,32]. Exclusion criteria were age < 18 years old, current psychological treatment, and the presence of a childbirth-related PTSD according to DSM-5[33]. After trial commencement, an addition to the exclusion criteria was made for women with intermediate or high suicide risk, or severe psychotic disorder (based on the Mini international neuropsychiatric interview (MINI)-plus)[34], since these psychiatric comorbidities would not be in accordance with our low-risk study design.

Procedure

During routine antenatal checks, all eligible pregnant women with a gestational age between 8 and 20 weeks were screened for FoC using the WDEQ-A[35]. Women with FoC were invited for a clinical interview during which psychological comorbidity was assessed using the MINI-plus[34] and Clinician-administered PTSD scale (CAPS-5)[36], and exclusion criteria were checked. When eligible, women were randomized to the treatment-group or care-as-usual group on a 1:1 ratio by block randomization with random block size using an independent computer program[37]. Stratification variables were not applicable.

In the EMDR therapy group, measurements of FoC took place at the start of each therapy session. Follow-up measurements were evaluated by a blinded assessor with a second clinical interview at 32-34 weeks of gestational age (T1). Two to three months after childbirth an e-mail questionnaire was sent, including self-report questionnaires and questions about possible support/treatment for fear of childbirth that patients arranged themselves.

Intervention

EMDR therapy group; in addition to standard antenatal care, the participants received (a maximum of) three 90-minute sessions EMDR therapy by a psychologist. All seven participating psychologists had two years additional training as a clinical psychologist, completed the accredited basic and advanced EMDR training course, and had at least one year experience with providing EMDR therapy. Measurement of FoC symptoms took place at the start of each session. All therapy sessions were videotaped to allow for rating of treatment fidelity and for supervision purposes.

In the OptiMUM-study, EMDR therapy included the EMDR standard Dutch protocol[22,38]. The procedure applied in the present study a three-pronged approach of processing (1) disturbing memories of *past* experiences that caused the fear, (2) catastrophic images fuelling the anticipatory fear such as the baby dying during childbirth, or having unbearable pain (i.e., flashforwards)[39], and (3) triggers that *currently* evoke distress (using Shapiro's 'mental video check')[22]. EMDR therapy was carried out with the use of rapid deployment of sets of eye movements. To maximize taxation of patients' working memory if needed, the therapist was allowed to add working memory taxation by using faster eye movements, change directions of the movements, or the use of extra earphones with a clicking sound, or hand-holdable pulsers providing alternating tactile stimulation memory[28].

CAU group; participants received standard antenatal care with routine obstetrical checks provided by their hospital or midwifery practice. EMDR therapy or other interventions aimed at reducing FoC were not routinely offered. Assuming good clinical care, healthcare providers might refer anxious or traumatized pregnant women according to their own clinical practices and guidelines. Type and frequency of any form of professional care was registered for both groups.

Measures

The severity of FoC was measured by the WDEQ-A. The WDEQ[40] is a 33-item self-report questionnaire with two versions: assessing antenatal FoC (WDEQ-A), or childbirth experience (WDEQ-B). It was designed monofactorial with a sum score between 0 and 165, but can be used dichotomous with a cut-off of ≥ 85[31,32]. Safety was assessed by measuring the occurrence of worsening of FoC symptoms, dropout (i.e., not starting EMDR treatment, or not completing treatment after one or more previous EMDR sessions), serious adverse events, and increased suicide risk (i.e., proportion high suicide risk based on MINI-plus).

Psychological comorbidity was assessed with a clinical interview, including the Dutch versions of the MINI-plus[34] and CAPS-5[36].

Statistical methods

Before starting analyses, all data was screened for data-entry errors and outliers. The extent of missing data was assessed and assumptions for the analyses were checked. To compare groups at baseline measurements, P-values were calculated with 2 tailed independent Mann-Whitney U test (for continuous variables) and Fisher's exact test (for categorical variables) to compare groups. All analyses were performed intention-to-treat. The sample size was calculated at 51 participants in each group to obtain a power of 80% to detect an effect size of 0.5[30]. The WDEQ-A sum scores were modelled using linear mixed models (LMM) to adjust for repeated measurements. Time was used as a categorical variable (number of visits), and treatment condition as a fixed effect. Within

group effect sizes were calculated with Cohen's *d*[41]. Clinically relevant symptom change on the WDEQ-A was assessed by reporting the Reliable Change of symptoms (RC)[42,43] and the percentage of women with a WDEQ-A sum score below the cut-off of ≥85. The RC of symptoms was calculated for each group to adjust for possible measurement errors, and resulted in symptom improvement and worsening scores above 5.3 (CAU) or 4.9 (EMDR) on WDEQ-A. Our study was not powered for measures indexing safety; therefore, these outcomes were shown descriptively. The level of significance was set at $\alpha = 0.05$. Analyses were performed using IBM SPSS Statistics for Windows, version 23.0.

RESULTS

In total 141 pregnant women were included, of which 110 completed the post-treatment measurement. Figure 1 shows the patient flow through the trial. At T0, no statistically significant differences were found between the EMDR therapy and CAU group with respect to demographic variables (see Table 1).

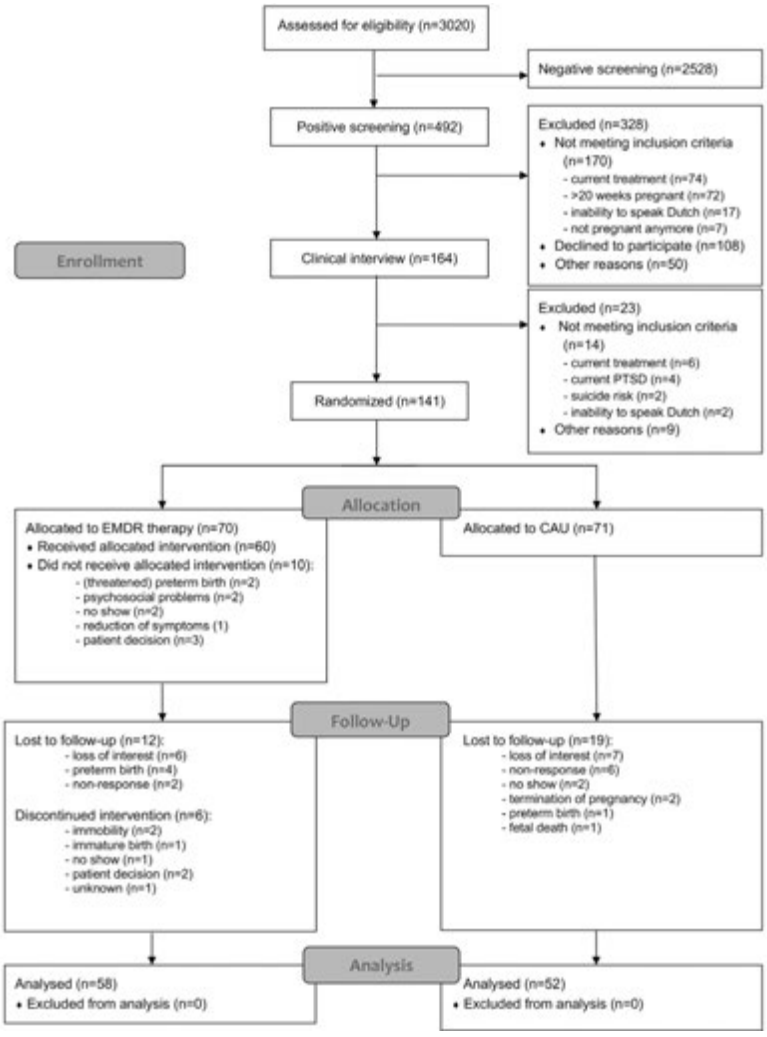


Figure 1. Flow diagram. CAU, Care-as-Usual; EMDR, Eye Movement Desensitization and Reprocessing therapy

Table 1. Demographic and clinical characteristics at baseline, mean±SD or n (%).

	EMDR therapy group (n=70)	CAU group (n=71)	p-value
Age (years)	33.5±5.0	34.6±4.6	0.16
Gestational age at randomization (days)	115.6±23.2	121.0±23.1	0.23
Ethnicity*			0.62
Dutch	55 (78.6)	60 (84.5)	
Other, European	7(10.0)	6 (8.5)	
Other, Non-European	6 (8.6)	5 (7.0)	
Mixed	2 (2.9)	0 (0.0)	
Educational level[a]*			0.40
Low	15 (21.5)	9 (12.7)	
Middle	19 (27.1)	25 (35.2)	
High	35 (50.0)	33 (46.5)	
Marital status*			0.47
Co-habiting with partner	60 (85.7)	58 (81.7)	
Partner, not living together	8 (11.4)	5 (7.0)	
No partner	0 (0.0)	3 (5.6)	
Other	1 (1.4)	1 (1.4)	
Parity			0.78
Nulliparous	33 (47.1)	34 (47.8)	
Multiparous	37 (52.9)	37 (52.1)	
Pregnant after fertility treatment*	12 (17.1)	7 (9.9)	0.32
Current use of psychoactive medication*	10 (14.3)	4 (5.6)	0.76
Comorbid disorder			
Mood disorder	10 (14.3)	12 (16.9)	0.67
Anxiety disorder	11 (15.7)	13 (18.3)	0.68
Suicide-risk (low)	6 (8.6)	7 (9.9)	0.79
Traumatic experiences[b]	15 (21.4)	11 (15.5)	0.33
Previous childbirth	31 (44.3)	30 (42.3)	
Sexual abuse	3 (4.3)	2 (2.8)	
Physical abuse	2 (2.9)	5 (7.0)	
Work-related	2 (2.9)	1 (1.4)	
Natural disasters, accidents, victims of war	11 (15.7)	8 (11.3)	
Other	2 (2.9)	4 (5.6)	
Previous diagnosis of PTSD*	9 (12.9)	7 (9.9)	0.64
Previous EMDR therapy*	13 (18.6)	9 (12.7)	0.39
Traumatic childbirth	4 (5.7)	4 (5.6)	
Sexual assault	2 (2.9)	0 (0.0)	
Other	7 (10.0)	5 (7.1)	

Low: completed high-school (Dutch: MAVO, HAVO, VWO, MBO). Middle: applied sciences (Dutch: HBO). High: completed degree (Dutch: WO).
Defined by Life Events Checklist-5 (LEC-5[44])
5 missing (4 CAU, 1 EMDR)
CAPS, Clinician Administered PTSD Scale; CAU, Care-as-Usual; EMDR; Eye Movement Desensitization and Reprocessing therapy; PCL-5; PTSD Checklist for DSM-5

Safety measurements

Worsening of symptoms of FoC

A reliable worsening of symptoms of FoC occurred in 6.9% (4/58) in the EMDR group, versus 13.5% (7/52) in the CAU group, $X^2(1)=0.85$, $p=0.36$.

Treatment drop-out

Ten out of 70 patients who were randomized to receive EMDR therapy did not start treatment. This was due to logistical or psychosocial problems (n=4), obstetrical reasons (n=2), no show for unknown reasons (n=2), spontaneous remission of symptoms (n=1) or loss of interest (n=1). During EMDR treatment the drop-out rate was 10%: of the 60 women who started therapy six (10%) discontinued treatment prematurely, all after completing one session. This dropout was caused by obstetric reasons (n=3), two consecutive late cancellations/no show (n=1), and non-response (n=1). Lastly, one woman discontinued therapy since she wanted to avoid thinking of any disturbing image, an essential part of the EMDR protocol. Of the remaining 54 women, n=2 participants completed the therapy in one session (3.7%), n=22 in two sessions (40.7%) and n=30 (55.5%) in three therapy sessions. No significant differences in demographics were found between those completing treatment, drop-outs and those who did not start treatment. The percentage of women included in the final analyses did not differ significantly between groups, with 82.9% (58/70) and 73.2% (52/71) completing the second clinical interview in EMDR and CAU, respectively.

In the e-mail survey that was sent 8-12 weeks postpartum, six (21.4%) of the 28 women who replied from the CAU group reported to have initiated treatment by a psychologist themselves during the pregnancy (exact timing of therapy not reported). Of these six, three women received one (n=1), two (n=1) or three (n=1) sessions EMDR therapy.

Serious Adverse Events

Two Serious Adverse Events (SAE) occurred during this trial, one in each randomization group. In the EMDR group, one woman with a twin pregnancy gave birth before the foetuses were viable (immature birth), and in the CAU group an intra-uterine foetal death occurred at 21 weeks of gestation.

Suicide risk

None of the participants developed intermediate or high suicide risk during the trial period, and one woman in de CAU group developed de novo low suicide risk. Of the 13 women with low suicide risk at the start of the trial, the low risk remained present in six women (2/6 in EMDR group, 4/7 in CAU group), and resolved for seven women (4/6 in EMDR group, 3/7 in CAU group).

Fear of childbirth

Both groups showed a very large (EMDR therapy, Cohen's *d* 1.36) or large (CAU, Cohen's *d* 0.89) and clinically meaningful reduction of FoC at each time point compared to pre-treatment. Mean WDEQ-A scores at each time point can be seen in Figure 2. Usage of a random intercept significantly improved the model and was included to the LMM analysis. The LMM analysis showed a non-significant decrease in FoC symptom severity in the EMDR therapy group compared to CAU (Table 2), t(2,67)=0,23, *p*=0.83, Cohen's *d*=0.39).

In the EMDR therapy group, 86.2% showed reliable symptom improvement on the WDEQ-A, with a mean decrease of 25.6 points (SD=18.9). In the CAU group, 76.9% showed reliable symptom improvement, with a mean decrease of 17.4 points (*SD*=19.6) on the WDEQ-A . There was no significant difference in women with a sum score below the WDEQ-A cut-off FoC in the EMDR group (72.4%) compared to the CAU group (59.6%) (X^2(1)=2,01, *p*=.17).

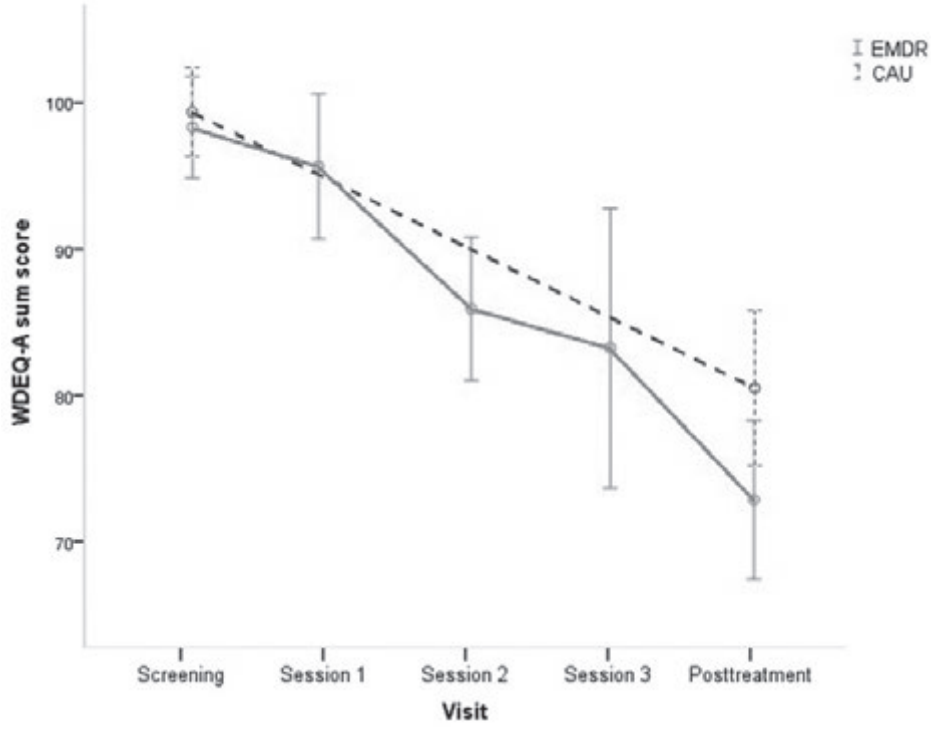


Figure 2. Mean WDEQ-A scores with 95% C.I. at each time point, for EMDR therapy group (N=58) and CAU (n=52) condition
CAU, Care-as-Usual; EMDR, Eye Movement Desensitization and Reprocessing therapy; WDEQ-A, Wijma Delivery Expectancy Questionnaire – version A

Table 2 WDEQ-A scores (mean±SD) at baseline (screening), sessions and post treatment (T1) in the EMDR therapy (n=58) and CAU group (n=52), within-group and between-group effect sizes

Groups	Measures					Within group effect sizes	Effect sizes of EMDR vs CAU	
	Screening	Session 1	Session 2	Session 3	T1	Cohen's *d*	*P-value*	Cohen's *d*
EMDR	99.4 (14.6)	96.6 (18.4)	86.8 (17.4)	84.1 (24.2)	73.9 (20.7)	1.36	0.83	0.39
CAU	99.9 (12.9)	x	x	x	81.9 (19.1)	0.89		

CAU, Care-as-Usual; EMDR; Eye Movement Desensitization and Reprocessing therapy; T1: posttreatment assessment at 32-34 weeks gestational age; WDEQ-A, Wijma Delivery Expectancy Questionnaire – version

DISCUSSION

The results of this study support our first hypothesis regarding safety, showing that the application of EMDR therapy was not associated with a significant increase of symptoms of FoC, the occurrence of SAEs, increased suicide risk, or a large drop-out, when compared to care as usual (CAU). Conversely, the results were not supportive of our second hypothesis regarding the effectiveness of EMDR therapy, showing that EMDR therapy did not result in a significantly greater FoC symptom reduction compared to CAU. Although studies with similar data on safety are lacking, the results are in line with a systematic review regarding the effectiveness of EMDR therapy in pregnant women with PTSD[25], which suggests that treatment is likely safe. Furthermore, the results of the current study demonstrate that EMDR therapy resulted in a significant decrease of FoC symptoms, with a very large effect-size (Cohen's *d* 1.36). This effect size is comparable with large to very large effect sizes reported in online cognitive behavioural therapy[45], motivational interviewing psychotherapy[16] and haptotherapy[17], and higher compared to psycho-education carried out by midwives[15].

For the finding that no significant difference was found between EMDR therapy and CAU regarding the decrease in FoC several explanations may be proposed. (1) A considerable number of participants (22.9% of the women randomized for EMDR therapy) did not start therapy or dropped out after only one treatment session, with most common reasons being logistical or psychosocial problems. Yet, additional analyses (data not shown) comparing only treatment completers to the CAU group on the decrease in FoC could not detect a significant difference between both groups in decrease in FoC; (2) The CAU group showed an unexpected large decrease of FoC. Based on several cross-sectional studies, one would rather assume that FoC would be stable or even aggravate during pregnancy, since delivery is getting closer and inevitable[46–48]. In several previous studies, participants in observational arms or CAU conditions were stable or showed an increase

in symptoms[18,47,49]. However, our finding is consistent with the results of another recent Dutch RCT comparing haptotherapy, psycho-education and CAU[17]. The symptom decline in the CAU group suggests natural recovery taking place, and that FoC may be self-limiting in some cases; (3) Part of the women in the CAU group had been treated for their FoC outside the context of this study. At postpartum follow-up, 21.4% of the women who were randomized for CAU stated to have initiated treatment for their fears themselves, half of which received EMDR therapy. However, additional analysis (data not shown) did not show different results; (4) Recruiting for the study may have led to more awareness among participating healthcare providers, resulting in improvement of FoC-informed antenatal care for both treatment groups; (5) For the pregnant women involved, their participation in this study resulted in more and specific attention from professionals for their psychological wellbeing, with comprehensive psychological interviews being part of this research. The identification and acknowledgement of FoC and the psychological burden that comes with it could have had therapeutical effects in itself[50]. A strength of the current study is that our study took place in a real-world clinical setting in both hospital and midwifery practices with a heterogeneous population, thereby enhancing the generalizability of the results. Also, all new pregnant women were invited in a standard way to take part in the screening for FoC, thereby decreasing the risk of selection bias. Conversely, there are also limitations of the present study that need to be mentioned; (1) We did not include a control condition other than CAU. Accordingly, no comparison could be made with a gold standard treatment for FoC since this is not available yet. In the current study, a lack of a (placebo or gold standard) intervention in the control group might have resulted in the relatively high number of women who initiated psychological treatment themselves. Comparing the effectiveness of several treatment conditions including FoC-informed maternity care is an important issue for future research. Besides focusing on efficacy, we suggest future studies to aim to identify risk factors that hinder spontaneous decrease of FoC during pregnancy because this may help to identify women who are likely to benefit most from EMDR therapy; (2) Certain populations were excluded. Women with intermediate or high suicide risk or severe psychotic disorder were excluded because of the low-risk study design. Women currently receiving psychological treatment (15.0% of all women with a positive screening for FoC) were excluded. It is important to include assessment of FoC during any psychological treatment in childbearing women; (3) Women with a gestational age below eight or above 20 weeks at time of screening were not included to avoid drop-out due to non-vital pregnancies and to have sufficient time to plan therapeutic sessions during the remainder of the pregnancy. In future studies, women should be included independent of gestational age, with sample size calculation generously adjusting for rates of drop-out and cross-over. Lastly, this study was carried out in a high-income country with good access to public health services, as can be seen in the high percentage of women with prior EMDR treatment (Table 1). Most women in our sample were highly-educated, cohabiting/married and Dutch. Although influence of these factors on remission of FoC is unknown[46], it may lead to a lack of generalizability.

In conclusion, the results of this study suggest that EMDR therapy in pregnant women with FoC is safe regarding psychological outcomes, and effective in reducing FoC. However, no significant beneficial effects of EMDR therapy over and above those of CAU were found. Accordingly, although EMDR therapy and CAU may both be viable options to choose for the treatment of pregnant women with FoC, the current study does not justify implementation of EMDR therapy as an additional treatment in this particular setting. Clearly, while replication of our findings is important, for future research it is important to determine whether there may be certain subgroups of patients for which trauma-focused treatment does have added value. For example, in the case that the offered standard care does not automatically lead to alleviation of fear and patients are at risk having to endure childbirth with great fear. Hence, further studies are needed to indicate which subgroups have low chance at spontaneous decrease of FoC and might benefit most from EMDR therapy.

Funding details

This work was supported by grants from the Stichting EMDR Nederland (Dutch EMDR Association), Fonds Gezond Geboren, Stichting Teaching Hospital OLVG and Stichting Wetenschap OLVG, all awarded to the principal investigator M.G. van Pampus.

REFERENCES

1. O'Connell MA, Leahy-Warren P, Khashan AS, Kenny LC, O'Neill SM. Worldwide prevalence of tocophobia in pregnant women: systematic review and meta-analysis. Vol. 96, Acta Obstetricia et Gynecologica Scandinavica. Wiley-Blackwell; 2017. p. 907–20.
2. Adams SS, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: A study of 2206 women with intended vaginal delivery. Br J Obstet Gynaecol. 2012;119:1238–1246.
3. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Obstetric outcome after intervention for severe fear of childbirth in nulliparous women - randomised trial. Br J Obstet Gynaecol. 2013;120(1):75–84.
4. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Ryding EL, et al. Group psychoeducation with relaxation for severe fear of childbirth improves maternal adjustment and childbirth experience – a randomised controlled trial. J Psychosom Obstet Gynaecol. 2015;36(1):1–9.
5. Salomonsson B, Wijma K, Alehagen S. Swedish midwives'perceptions of fear of childbirth. Midwifery. 2010;26(3):327–37.
6. Hofberg K, Brockington I. Tokophobia: An unreasoning dread of childbirth. A series of 26 cases. Br J Psychiatry. 2000;176(JAN.):83–5.
7. Ryding ELEL, Wijma B, Wijma K, Rydhström H, Lukasse M, Parys AS Van, et al. Fear of childbirth and risk of cesarean delivery: A cohort study in six European countries. Birth. 2015;42(1):48–55.
8. Størksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective caesarean section: a population-based study. BMC Pregnancy Childbirth. 2015;17(15):221.
9. Waldenström U, Hildingsson I, Ryding EL. Antenatal fear of childbirth and its association with subsequent caesarean section and experience of childbirth. BJOG. 2006;113(6):638–46.
10. Söderquist J, Wijma B, Thorbert G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. Br J Obstet Gynaecol. 2009;116(5):672–80.
11. van Heumen MA, Hollander MH, van Pampus MG, van Dillen J, Stramrood CAI. Psychosocial Predictors of Postpartum Posttraumatic Stress Disorder in Women With a Traumatic Childbirth Experience. Front Psychiatry. 2018;9(July):1–9.
12. Raïsanen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. Br J Obstet Gynaecol. 2014;121(8):965–70.
13. Lima SAM, El Dib RP, Rodrigues MRK, Ferraz GAR, Molina AC, Neto CAP, et al. Is the risk of low birth weight or preterm labor greater when maternal stress is experienced during pregnancy? A systematic review and meta-analysis of cohort studies. PLoS One. 2018;13(7):1–15.
14. Yonkers KA, Smith MV, Forray A, Epperson CN, Costello D, Lin H, et al. Pregnant women with posttraumatic stress disorder and risk of preterm birth. JAMA Psychiatry. 2014;71(8):897–904.
15. Toohill J, Fenwick J, Gamble J, Creedy DK, Buist A, Turkstra E, et al. A Randomized Controlled Trial of a Psycho-Education Intervention by Midwives in Reducing Childbirth Fear in Pregnant Women. Birth. 2014;41(4):384–94.
16. Abdollahi S, Faramarzi M, Delavar MA, Bakouei F, Chehrazi M, Gholinia H. Effect of Psychotherapy on Reduction of Fear of Childbirth and Pregnancy Stress: A Randomized Controlled Trial. Front Psychol. 2020;May(11):787.

17. Klabbers GA, Wijma K, Paarlberg KM, Emons WHM, Vingerhoets AJJM. Haptotherapy as a new intervention for treating fear of childbirth: a randomized controlled trial. J Psychosom Obs Gynaecol. 2019;40(1):38–47.

18. Saisto T, Salmela-Aro K, Nurmi JE, Könönen T, Halmesmäki E. A randomized controlled trial of intervention in fear of childbirth. Obstet Gynecol. 2001;89(5):820–6.

19. Ryding EL, Persson A, Onell C, Kvist L. An evaluation of midwives' counseling of pregnant women in fear of childbirth. Acta Obstet Gynecol Scand. 2003;82(1):10–7.

20. Larsson B, Karlström A, Rubertsson C, Hildingsson I. The effects of counseling on fear of childbirth. Acta Obstet Gynecol Scand. 2015;94(6):629–36.

21. Burger H, Verbeek T, Aris-Meijer JL, Beijers C, Mol BW, Hollon SD, et al. Effects of psychological treatment of mental health problems in pregnant women to protect their offspring: randomised controlled trial. Br J Psychiatry. 2020;216(4):182–8.

22. Shapiro F. Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures. 3rd ed. New York, NY, US: Guilford Press; 2018.

23. WHO. Guidelines for the management of conditions that are specifically related to stress. Geneva: World Health Organization; 2013.

24. ISTSS. The ISTSS PTSD Prevention and treatment guidelines. Methodology and Recommendations and Position on Complex PTSD. 2018.

25. Baas MAM, van Pampus MG, Braam LM, Stramrood CAI, de Jongh A. The effects of PTSD treatment during pregnancy: systematic review and case study. Eur J Psychotraumatol. 2020;11(1):1762310.

26. Sandström M, Wiberg B, Wikman M, Willman AK, Högberg U. A pilot study of eye movement desensitisation and reprocessing treatment (EMDR) for post-traumatic stress after childbirth. Midwifery. 2008;24(1):62–73.

27. Stramrood CAI, Van der Velde J, Doornbos B, Paarlberg KM, Weijmar Schultz WC, Van Pampus MG. The patient observer: eye-movement desensitization and reprocessing for the treatment of posttraumatic stress following childbirth. Birth. 2012;39(1):70–6.

28. de Jongh A, Ernst R, Marques L, Hornsveld H. The impact of eye movements and tones on disturbing memories involving PTSD and other mental disorders. J Behav Ther Exp Psychiat. 2013;44:477–83.

29. Kavakci O, Yenicesu GI. Eye Movement Desensitization and Reprocessing (EMDR) for Hyperemesis Gravidarum. J Psychiatry Neurol Sci. 2014;27(4):335–41.

30. Baas MAM, Stramrood CAI, Dijksman LM, de Jongh A, van Pampus MG. The optiMUM-study: EMDR therapy in pregnant women with posttraumatic stress disorder after previous childbirth and pregnant women with fear of childbirth: Design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1).

31. Calderani E, Giardinelli L, Scannerini S, Arcabasso S, Compagno E, Petraglia F, et al. Tocophobia in the DSM-5 era: Outcomes of a new cut-off analysis of the Wijma delivery expectancy/experience questionnaire based on clinical presentation. J Psychosom Res. 2019;116:37–43.

32. Nilsson C, Hessman E, Sjöblom H, Dencker A, Jangsten E, Mollberg M, et al. Definitions, measurements and prevalence of fear of childbirth: A systematic review. BMC Pregnancy Childbirth. 2018;18(1).

33. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.

34. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 1998;59:34–57.

35. Garthus-Niegel S, Størksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol. 2011;32(3):160–3.

36. Boeschoten MA, Bakker A, Jongedijk RA, van Minnen A, Elzinga BM, Rademaker AR, et al. Clinician Administered PTSD Scale for DSM-5 – Dutch version. Arq Psychotrauma Expert Groep, editor. Diemen; 2014.

37. Castor EDC. 2019.

38. de Jongh A, ten Broeke E. Handboek EMDR: Een geprotocolleerde behandelmethode voor de gevolgen van psychotrauma. Pearson Assessment and Information; 2019.

39. Logie R, de Jongh A. The "Flashforward procedure": Confronting the Catastrophe. J EMDR Pract Res. 2014;8(1):25–32.

40. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84–97.

41. Cohen J. Statistical Power Analysis for the Behavioral Sciences. New York: Routledge Academic; 1988.

42. Evans C, Margison D, Barkham M. The contribution of reliable and clinically significant change methods to evidence-based mental health. Evid Based Ment Heal. 1998;1:70–2.

43. Wise EA. Methods for Analyzing Psychotherapy Outcomes: A Review of Clinical Significance, Reliable Change, and Recommendations for Future Directions. J Pers Assess. 2004;82(1):50–9.

44. Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane T. The Life Events Checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD at www.ptsd.va.gov; 2013.

45. Nieminen K, Andersson G, Wijma B, Ryding EL, Wijma K. Treatment of nulliparous women with severe fear of childbirth via the Internet: a feasibility study. J Psychosom Obs Gynaecol. 2016;37(2):37–43.

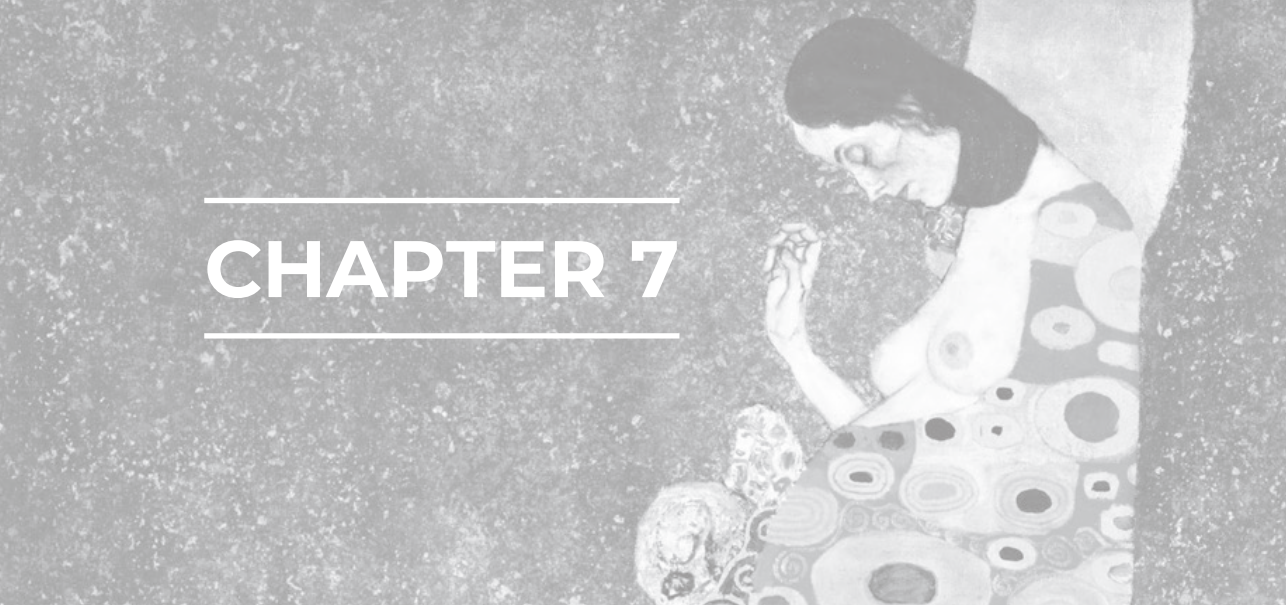
46. Lukasse M, Schei B, Ryding EL, Group on behalf of BS. Prevalence and associated factors of fear of childbirth in six European countries. Sex Reprod Healthc [Internet]. 2014;5(3):99–106. Available from: http://dx.doi.org/10.1016/j.srhc.2014.06.007

47. Nieminen K, Stephansson O, Ryding LR. Women's fear of childbirth and preference for cesarean section – a cross-sectional study at various stages of pregnancy in Sweden. Acta Obstet Gynecol Scand. 2009;88:807–13.

48. Rouhe H, Salmela-Aro K, Halmesmäki E, Saisto T. Fear of childbirth according to parity, gestational age, and obstetric history. Br J Obstet Gynaecol. 2009;116(1):67–73.

49. Hildingsson I, Nilsson C, Karlstrom A, Lundgren I. A longitudinal survey of childbirth-related fear and associated factors. J Obstet Gynecol neonatal Nurs. 2011;40(5):532–43.

50. O'Connell MA, Khashan AS, Leahy-Warren P. Women's experiences of interventions for fear of childbirth in the perinatal period: A meta-synthesis of qualitative research evidence. Women and Birth [Internet]. 2021;34(3):e309–21. Available from: https://doi.org/10.1016/j.wombi.2020.05.008



CHAPTER 7

How safe is the treatment of pregnant women with fear of childbirth using eye movement desensitization and reprocessing therapy? Obstetric outcomes of a multi-center randomized controlled trial

Baas MAM, Stramrood CAI, Dijksman LM, Vanhommerig JW, de Jongh A, van Pampus MG. How safe is the treatment of pregnant women with fear of childbirth using eye movement desensitization and reprocessing therapy? Obstetric outcomes of a multi-center randomized controlled trial. Acta Obstet Gynecol Scand. 2023;102:1575-1585. doi: 10.1111/aogs.14628.

ABSTRACT

Introduction

Pregnant women with Fear of Childbirth (FoC) display an elevated risk of a negative delivery experience, birth-related post-traumatic stress disorder (PTSD), adverse perinatal outcomes such as preterm birth, low birthweight and postpartum depression. One of the therapies used to treat FoC is eye movement desensitization and reprocessing (EMDR) therapy. The purpose of the present study was to determine the obstetric safety and effectiveness of EMDR therapy applied to pregnant women with FoC.

Material and methods

A randomized controlled trial (the OptiMUM-study) was conducted in two teaching hospitals and five community midwifery practices in the Netherlands (www.trialregister.nl, NTR5122). Pregnant women (n=141) with a gestational age between 8 and 20 weeks and suffering from FoC (i.e., sum score on the Wijma Delivery Expectations Questionnaire ≥85) were randomly allocated to either EMDR therapy (n=70) or care-as-usual (CAU; n=71). Outcomes were maternal and neonatal outcomes and patient satisfaction with pregnancy and childbirth.

Results

A high percentage of cesarean sections (37.2%) were performed, which did not differ between groups. However, women in the EMDR therapy group proved seven times less likely to request an induction of labor without medical indication than women in the CAU group. There were no other significant differences between the groups in maternal or neonatal outcomes, satisfaction or childbirth experience.

Conclusions

EMDR therapy during pregnancy does not adversely affect pregnancy or the unborn babies. Therefore, therapists should not be reluctant to treat pregnant women with FoC using EMDR therapy.

INTRODUCTION

Fear of Childbirth (FoC) is an important topic in obstetrics, and the literature suggests that FoC is not only associated with adverse psychological outcomes such as a negative delivery experience, the development of post-traumatic stress disorder (PTSD) and postpartum depression[1–3], but also with adverse perinatal outcomes such as requesting an planned cesarean section without medical indication[4,5], preterm birth and lower birthweight[6,7]. The adverse effects of maternal stress on the fetus have been widely described[8–10].

The safety of interventions aimed at reducing FoC is a key concern. One randomized controlled trial (RCT) that compared group psycho-education with relaxation (n=131) versus care-as-usual (CAU, n=240) found that women who received psycho-education were significantly more likely to have a more positive birth experience[11] and vaginal delivery[12]. Furthermore, a recent RCT that examined the effectiveness of mindfulness-based childbirth and parenting (MBCP, n=75) found a significant decrease in planned cesarean sections compared to "enhanced-care-as-usual" (n=66; i.e., two individual 90-minute sessions by trained midwives with psycho-education and making a coping plan)[13]. Conversely, another study in which pregnant women were randomly allocated to telephone psycho-education by a midwife (n=170) versus CAU (n=169) showed no significant reduction in overall and unplanned cesarean sections, nor in any other obstetric outcome compared to usual maternity care[14]. Also, in a study that compared cognitive behavioural therapy (CBT) and informative appointments (n=85) with CAU (n=91), no difference in planned cesarean sections was found[15]. However, there are indications that the application of psychotherapeutic intervention during pregnancy can adversely affect obstetric outcomes. For instance, an RCT among pregnant women with antenatal depression and/or anxiety found that CBT (n=140), compared to CAU (n=142), led to elevated levels of maternal anxiety and depression, and indications for adverse effects of CBT on the infant's gestational age at delivery[15]. These findings underline the importance of greater clarity regarding the safety of psychotherapeutic interventions aimed at reducing anxiety and distress in pregnant women.

The randomized controlled trial the OptiMUM-study, aimed at determining the effectiveness and safety of therapy in pregnant women with FoC, showed no significant difference between EMDR therapy and CAU, with large decreases in FoC in both groups. In addition, no worsening of FoC symptoms or other adverse effects on patients' psychological health were observed[16]. The purpose of the current study was to determine the outcomes of obstetric variables in this RCT. We hypothesized that EMDR therapy would not be associated with significantly more obstetric complications than CAU. We hypothesized that EMDR therapy would result in a lower percentage of cesarean sections and more positive childbirth experiences compared to CAU. Furthermore, we hypothesized that EMDR therapy would not be associated with significantly more neonatal complications than CAU.

MATERIALS AND METHODS

Study design

The OptiMUM-study consisted of two RCTs with an overlapping design, both evaluating the safety and effectiveness of EMDR therapy in pregnant women. The study protocol has been published previously[17]. One RCT was conducted among pregnant women with PTSD and was published as a systematic review and a case study[18]. The (primary) psychological outcomes of the other trial that pertained to the effectiveness of EMDR therapy on fear of childbirth (FoC) has recently have been published[16].

Participants

Participants in the study were recruited between February 2015 and November 2019 in the outpatient settings of two hospitals and five community midwifery practices in the city of Amsterdam, the Netherlands. During their antenatal consultation, all pregnant women with a gestational age between 8 and 20 weeks who mastered the Dutch language were invited to participate in the screening for FoC. Participants were eligible to participate in the RCT in the case of FoC based upon a sum score of ≥85 on the Wijma Delivery and Expectancy questionnaire – version A (WDEQ-A[19]). The exclusion criteria were age below 18 years old, current psychological treatment, the presence of PTSD, a psychotic disorder, or an intermediate/high suicide risk as indexed using the Mini international neuropsychiatric interview (MINI)-plus[20]. A more detailed description of the instruments that were used has been published in our protocol[17].

Procedure

All women with a positive FoC screen were invited to participate in a clinical interview to assess psychological comorbidities. In case no exclusion criteria were present, women were randomly allocated by an independent computer program (Castor EDC, 2019) to either EMDR therapy or CAU on a 1:1 allocation ratio. No restrictions or stratification factors were applies. The caregivers and assessors were blinded to the randomization results. Two to three months after delivery, the women received an email survey including validated questionnaires about the experience of pregnancy and childbirth, and questions about possible treatment or support they had been referred to, or had arranged themselves for their FoC symptoms.

Interventions

Participants in the EMDR therapy group received (a maximum of) three EMDR therapy sessions of 90 minutes carried out by a psychologist, in addition to their standard antenatal care. All psychologists involved in this study had completed two years of postgraduate training as a clinical psychologist and had at least one year experience in providing EMDR therapy after they completed a basic and an advanced training in EMDR therapy accredited by EMDR Europe. EMDR therapy was conducted according to the Dutch version of the standard EMDR protocol[21,22] using rapid eye movements. If necessary, it

was allowed to maximize the taxation of patients' working memory with alternating tactile stimulation using techniques from EMDR 2.0[23]. EMDR therapy includeds a three-pronged approach focused on past experiences that caused the fear, catastrophic thoughts that fuelled patient's anticipatory fear (flashforward procedure), and the application of a mental video check of images leading to current distress[22].

Participants in the CAU group received regular antenatal care including standard obstetric consultations with a doctor or midwife. No intervention aimed at reducing FoC was routinely offered; however, assuming good clinical care, anxious women could be referred according to own local clinical guidelines or empirical experience.

Measurements

The primary outcome of the OptiMUM-study was FoC as measured by the WDEQ-A. The WDEQ[24] is a 33-item self-report questionnaire assessing Fear of Childbirth (WDEQ-A) or the cognitive appraisal (experience) of childbirth (WDEQ-B). Although this questionnaire was designed as a monofactorial scale with a sum score ranging from 0 to 165, evidence suggests that it can also be used dichotomously with a cut-off of ≥ 85 for clinically relevant Fear of Childbirth[25].

The questionnaire sent to all participants two to three months after childbirth consisted of three self-reported outcome measures: WDEQ-version B, satisfaction with pregnancy and childbirth, and the Childbirth Perception Scale. Satisfaction about pregnancy and childbirth was evaluated using the questions 'how satisfied were you about your pregnancy' and 'how satisfied were you about your childbirth' on a scale from 0 (extremely unsatisfied) to 10 (extremely satisfied). The Childbirth Perception Scale is a 12-item Dutch questionnaire that measures the perception of delivery and the first postpartum week, and has adequate psychometric properties with good internal consistency[26].

Obstetric outcome data were extracted from obstetric medical records. In the Netherlands, antenatal appointments for women with low-risk pregnancies can take place in first-line midwifery practices, and women choose whether to deliver at home or in a hospital with their own community midwife. Antenatal appointments and deliveries of women with medium or high-risk pregnancies occur in a hospital setting under the supervision of an obstetrician. Transfer of care during birth was defined as referral during labor or postpartum period, (a) from home or hospital setting under supervision of a community midwife (low risk) to a hospital setting under supervision of an obstetrician (medium/high risk), or (b) from a general hospital (medium/high risk) to a tertiary referral centre (high risk). No interim analysis was conducted. Due to a low number of adverse obstetric outcomes, composite neonatal and maternal outcomes were defined based upon clinical relevance. The maternal composite outcome included: postpartum hemorrhage (>1 litre blood loss regardless of mode of delivery, in accordance with the definition of the Dutch national guidelines[27]), third- or fourth-degree perineal tears (obstetric anal sphincter injury, OASI),

and cesarean section. The neonatal composite outcome included: Apgar score after 5 minutes <7, umbilical artery pH < 7.05, admission to a neonatal intensive care unit (NICU).

Statistical analyses

Differences between groups in baseline characteristics, and the comparison between the treatment group and CAU on all obstetric outcomes were analysed using two-tailed independent t-test (continuous variables) and Chi-square (categorical variables), or Mann Whitney U test and Fisher's exact test when appropriate. The analysis of mode of delivery using mode of delivery as an independent variable, was conducted using a logistic regression analysis, adjusting for significant variables. All analyses were performed according intention-to-treat, with significance levels set at alpha=0.05. Statistical analyses were carried out using IBM SPSS Statistics for Windows, version 27.

Ethics statement

The study protocol was approved by the Medical Research Ethics Committee and registered prospectively (www.trialregister.nl, NTR5122), which is now included in the International Trial Registry Platform (ICTRP) (accessible through https://trialsearch.who.int/Trial2.aspx?TrialID=NTR51220). The RCT was registered on March 31, 2015, with the first participant inclusion on April 1st, 2015. There was no active patient or public involvement in the design of this trial.

RESULTS

Figure 1 shows the flowchart of patient inclusion. Of the 28 women in the CAU group who replied to the postpartum survey, six women (21.4%) reported that they had initiated treatment by a psychologist themselves during pregnancy, of which half received EMDR therapy. Demographic and clinical characteristics can be seen in Table 1.

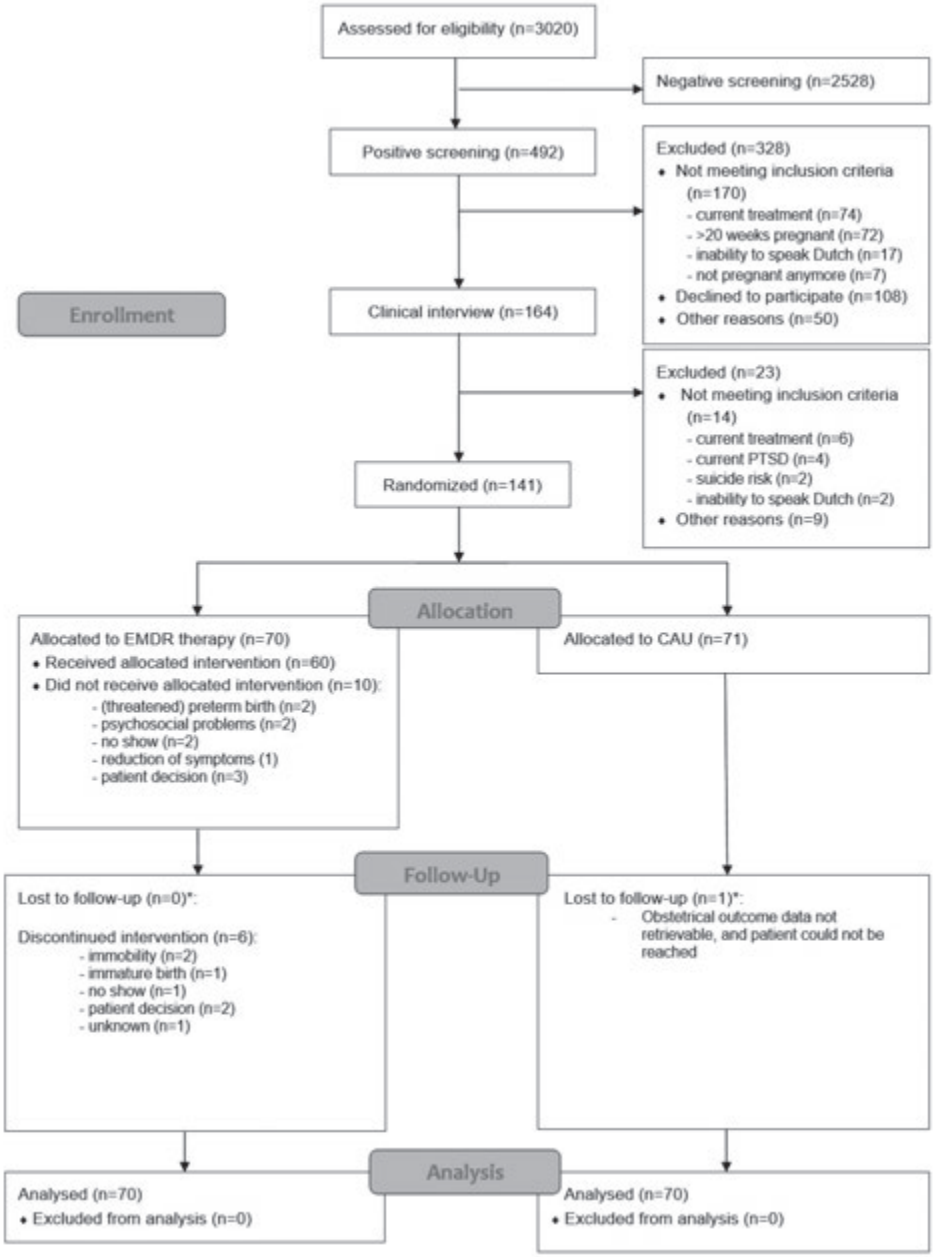


Figure 1. Flowchart. CAU, care-as-usual; EMDR, eye movement desensitization and reprocessing therapy.

Table 1. Demographic and clinical characteristics at baseline

	EMDR therapy group (n=70)	**CAU group (n=71)**
Age (years)	33.5±5.0	34.6±4.6
Gestational age at randomisation (days)	115.6±23.2	121.0±23.1
Ethnicity*		
Dutch	55 (78.6)	60 (84.5)
other, European	7(10.0)	6 (8.5)
other, non-European	6 (8.6)	5 (7.0)
mixed	2 (2.9)	0 (0.0)
Educational level[a]*		
low	2(2.9)	0 (0.0)
middle	13(18.9)	9(8.8)
high	54(80.6)	58 (86.6)
Married / co-habiting with partner*	68 (97.1)	63 (88.7)
Parity		
nulliparous	33 (47.1)	34 (47.8)
multiparous	37 (52.9)	37 (52.1)
Pregnant after fertility treatment*	12 (17.1)	7 (9.9)
Multiple pregnancy[c]	4 (5.7)	4 (5.6)
Cesarean section in history	12 (16.9)	8 (11.4)
Traumatic experiences (general)[b]	60 (85.7)	63(88.7)
Previous traumatic childbirth experience[b]	31 (44.3)	30 (42.3)
Previous EMDR therapy (event)*	13 (18.6)	9 (12.7)
- traumatic childbirth	4 (5.7)	4 (5.6)
- sexual assault	2 (2.9)	0 (0.0)
- other	7 (10.0)	5 (7.1)

CAU, Care-as-Usual. EMDR; Eye Movement Desensitization and Reprocessing therapy. All variables are in mean±standard deviation or number (%).
Low: completed elementary school (Dutch: basisschool, VMBO). Middle: completed high school or applied sciences (Dutch: HAVO, VWO, MBO). High: completed degree (Dutch: HBO, WO).
Defined by Life Events Checklist-5 (LEC-5(42)
All were twin pregnancies
5 missing (4 CAU, 1 EMDR)

Pregnancy

No significant differences in pregnancy characteristics were found between groups (Table 2). Two unexplained intrauterine foetal deaths occurred in the CAU-group, at 21 and 38 weeks of gestational age, versus none in the EMDR group.

Childbirth characteristics

Childbirth characteristics are shown in Table 2. Eighteen (12.9%) women delivered preterm (before 37 weeks of gestational age), with no difference between the groups (EMDR therapy: n=9; CAU: n=9, p=.587). Of all preterm births, respectively one (EMDR therapy: 23+4) and two (CAU: 19+0, 23+1) births were immature (before 24 weeks of gestational age). Both immature deliveries in the CAU group were iatrogenic termination of pregnancies because of severe congenital abnormalities.

The onset of labor did not differ between the groups (p=.542). In total, of the 138 women of whom the start of their labor was described, 59 (42.1%) labors started spontaneously, 52 (37.7%) were induced, and 27 (19.3%) were planned cesarean sections. The mode of delivery did not differ between the groups (p=.364). There were 76 (54.3%) spontaneous deliveries, 12 instrumental deliveries (8.6%), 25 (17.9%) unplanned cesarean sections and 27 (19.3%) planned cesarean sections. A multivariable analysis showed no difference between groups regarding the percentage of planned (p=.459) and unplanned cesarean sections (p=.166), or cesarean sections altogether (p=.110) (see Table 3 and 4).

Reasons for planned (p=.456) and unplanned (p=.752) cesarean sections did not differ between the groups. Interestingly, the reasons for induction of labor did differ between groups: in the CAU group, seven times more women requested an elective induction of labor without medical indication than in the EMDR group (EMDR therapy n=1; CAU: n=7, p=0.048). Most common reasons for planned cesarean sections were repeat cesarean (n=11, out of 20 women with a previous cesarean section), abnormal presentation of the foetus including breech position (n=7), maternal indication (n=4) consisting of prior uterine surgery or persistent symptoms after obstetric anal sphincter injury as a result of previous childbirth. Two women (without cesarean section in history) requested a planned cesarean section due to FoC, both had completed EMDR therapy. Reasons for unplanned cesarean sections were foetal distress (n=12), failure to progress in first stage of labor (n=8), failure to progress in second stage of labor (n=2), unexpected breech (n=1), failed induction (n=1) or unknown (n=1). These reasons did not differ between groups (p=.752).

Nineteen women (13.5%), 13 of whom were nulliparous, were transferred between healthcare providers: 12 women from the CAU-group, and seven from the EMDR therapy group, with no significant difference being observed between the two groups (p=.154). Of those women who planned to give birth at home with their community midwife, 61.5% did not give birth before. The transfer between healthcare providers mostly occurred during the dilation stage (first stage)of childbirth (n=17). The most common reasons for transfer were a request for pain relief during birth (EMDR therapy n=3; CAU: n= 6), meconium stained amniotic fluid (EMDR therapy: n=2; CAU: n=2) and prolonged prelabor rupture of membranes (more than 24 hours of ruptured membranes prior to the onset of labor; EMDR therapy n=0; CAU: n=2).

Patient perspectives

No significant differences between EMDR therapy and CAU were found regarding satisfaction about pregnancy (median=7.5, U=544, z=-1.01, p=.32) or childbirth (median =5.0, U=587, z=-.255, p=.80) in the Satisfaction Scale – Childbirth, and -Pregnancy. The WDEQ-B showed no differences between groups both continuously (p=.59) nor dichotomously (p=.28) (Table 2).

Table 2. Pregnancy and childbirth outcomes, mean ± SD or n (%)

	EMDR therapy group (n=70)	CAU group (n=71)	p-value
PREGNANCY			
Hospital admission	12 (17.1)	7 (10.1)[e]	.350
Total days of admission[a]	5 (1-15)	4 (1-11)	.649
Hypertensive disorder	6 (8.6)	4 (5.8)[e]	.750
Gestational diabetes	7 (10.0)	4 (5.8)[e]	.530
Placental abruption	0	1 (1.4)	.500
Premature rupture of membranes (PROM)	4 (5.7)	4 (5.8)	1
Intra-uterine foetal death (>22 weeks GA)	0	1 (1.4)[e]	.500
CHILDBIRTH			
Planned location of birth			.101
home	4 (5.7)	10 (14.5)[e]	
hospital low risk	7 (10.0)	7 (10.1)[e]	
hospital medium/high risk	59 (84.3)	52 (75.3)[e]	
Actual location of birth			.787
home	2 (2.9)	2 (2.9)[e]	
hospital low risk	2 (2.9)	4 (5.8)[e]	
hospital medium/high risk	66 (94.3)	63 (91.3)[e]	
Transfer of care during delivery	7 (10.0)	13 (18.9)[e]	.154
Gestational age at delivery (days)[a]	275 (267-282)	275 (270-280)	.828
Preterm birth (<AD37 GA)	9 (12.9)	9 (13.0)[e]	.587
Onset of labor			.542
spontaneous	29 (42.0)[d]	30 (43.5)[e]	
induced	24 (34.8)[d]	28 (40.6)[e]	
planned cesarean section	16 (23.2)[d]	11 (15.9)[e]	
Mode of delivery[a]			.364
spontaneous (vaginal)	33 (47.1)	43 (61.4)[d]	
instrumental (vaginal)	6 (8.6)	6 (8.6)[d]	
planned cesarean section	16 (22.9)	11 (15.7)[d]	
unplanned cesarean section	15 (21.4)	10 (14.3)[d]	
Augmentation of labor using oxytocin	31/50 (62.0)[g]	34/59 (58.0)[g]	.698
Pain relief	30/51 (58.8)[g]	36/60 (60.0)[g]	.527
epidural analgesia	16 (31.3)	22 (36.7)	.258
intravenous opiates (remifentanil®)	13 (25.5)	17 (28.3)	.416

Table 2. Pregnancy and childbirth outcomes, mean ± SD or n (%) *(continued)*

	EMDR therapy group (n=70)	**CAU group (n=71)**	**p-value**
other	1 (2.0)	0	
Duration active first stage (min) [a]	376 (242-611)	317.50(205-507)	.281
Duration second stage (min) [a]	26 (13-62)	28 (14-50)	.982
Duration third stage (min) [a]	9.5 (5-17)	11 (7-17)	.362
Blood loss (mL)*	325 (312.5)	300 (300)	.667
Postpartum hemorrhage (>1 L)	5 (7.1)	3 (4.4)[f]	.375
Manual removal of placenta	1 (1.4)	1 (1.5)[f]	.745
Blood transfusion	0	0	NA
Prelabor rupture of membranes (PROM, >24h)	5 (7.1)	6 (8.8)[f]	.480
Intrapartum fever (≥ 38°C)	1 (1.4)	4 (5.9)[f]	.174
Perineal damage (rupture or episiotomy)	33 (49.2)[f]	38 (55.9)[f]	.855
Episiotomy	11 (16.4)[f]	13 (19.1)[f]	.427
Third or fourth degree tear	2 (2.9)	2 (2.9)[f]	.679
Hospital admission days including/following birth[a]	2 (1-4)	2 (1-3)	.219
Maternal hospital re-admission	0	2 (2.8)	.241
Maternal death	0	0	1
Problems during puerperium	6 (8.6)	6 (8.8)[f]	1
Composite maternal outcome[b,c]	34 (48.6)	22 (31.0)	.084
PATIENT PERSPECTIVE			
Experiences of childbirth (WDEQ-B) – continuous scale (range 0-165)	71.61 (27.9)	62.10 (26.5)	.590
Experiences of childbirth (WDEQ-B) – dichotomous ≥85 (N)	7 (10.0)	6 (8.45)	.280
Childbirth Perception Scale (range 0-36)	19.89 (3.6)	20.02 (2.9)	.870
Satisfaction scale – pregnancy (range 1-10)[a]	7.5 (7-9)	7 (6-8)	.320
Satisfaction scale- childbirth[1](range 1-10)[a]	5 (6-9)	7 (5-9)	.800

Note: All variables are in median (interquartile range) or number (%). Unless stated otherwise, n and % are calculated excluding missing data.

CAU=Care-as-Usual. EMDR=Eye Movement Desensitization and Reprocessing therapy. GA= gestational age. All variables are in median (25%-75%) or number (%).

[a] non-normally distributed data, reported in median (interquartile range)

[b] logistic regression

[c] Maternal composite outcome: postpartum hemorrhage, third or fourth-degree perineal rupture, cesarean section.

[d] one participant missing

[e] two participants missing

[f] three participants missing

[g] four or more participants missing, exact number listed

Table 3. Results of multiple regression analysis regarding mode of delivery

	Univariate OR (95% CI)	p	Multivariable a OR (95% CI)	p
I. Cesarean sections (total)				.110
CAU versus EMDR group[#]	1.86 (.93-3.72)	.082	1.90 (.87-4.15)	
Multiple pregnancy	3.09 (0.70-13.47)	.135		
Preterm birth	1.81 (.69-5.10)	.214		
Cesarean section in history	5.17 (1.84-14.52)	.002	12.80 (3.40-48.26)	
Induction of labor	.38 (.18-.82)	.014	.43 (.18-1.01)	
Parity	.51 (.25-1.03)	.063	.16 (.06-.45)	

Abbreviations: aOR, adjusted odds ratio; CAU, care-as-usual; CI, confidence interval; EMDR, eye movement desensitization and reprocessing therapy; OR, odds ratio.
[a] Reference is the CAU group.

Table 4. Results of two secondary multiple regression analyses

	Univariate OR (95% CI)	p	Multivariable a OR (95% CI)	p
II. Planned cesarean section				.459
CAU versus EMDR group[a]	1.59 (.68-3.73)	.286	1.41 (.57-3.52)	
Cesarean section in history	7.87 (2.82-21.96)	<.001	7.67 (2.73-21.46)	
III. Unplanned cesarean section				.166
CAU versus EMDR group[a]	1.64 (.68-3.94)		1.96 (.76-5.05)	
Parity	.15 (.05-.48)	.001	.150 (.05-.47)	

Abbreviations: aOR, adjusted odds ratio; CAU, care-as-usual; CI, confidence interval; EMDR, eye movement desensitization and reprocessing therapy; OR, odds ratio.
[a] Reference is the CAU-group

Neonatal outcomes

From 141 women, 145 living children were born. Three children were born before viable age and did not survive. No significant differences were found between the groups, see Table 5.

Table 5. Neonatal outcomes.

	EMDR therapy group (n=70)	CAU group (n=71)	p-value
Birthweight, g	3255.87±719.4	3190.12±805.8	.974
Birthweight percentile[a]	49.5 (24-80)	49.5 (19-67)	.416
Foetal growth restriction (birthweight <p10)	12 (17.1)	12 (17.6)[d]	.558
Macrosomia (birthweight >p95)	5 (7.1)	6 (8.8)[d]	.480
Apgar at 1 min[a]	9 (8-9)	9 (8-9)	.259
Apgar at 5 min[a]	10 (9-10)	10 (9-10)	.293
Apgar at 5 min <7	2 (2.9)	4/67 (6.0)[e]	.320
Umbilical artery pH	7.17 (.1)	7.14 (.09)	.183
Umbilical artery Ph <7.05	2 (2.9)	1 (1.4)	.496
Shoulder dystocia	1 (1.4)	1 (1.4)[c]	.748
Pediatrician consult	33 (47.1)	27 (39.7)[c]	.217
Baby admitted to paediatrics/neonatal ward	26 (37.1)	20/67 (29.9)[e]	.235
Baby admitted to NICU	1 (1.4)	3 (4.3)[c]	.304
Congenital disorder	1 (1.4)	3 (4.4)[e]	.299
Neonatal death	0	0	NA
Perinatal death	1 (1.4)	1 (1.5)[d]	.745
Type of feeding			.930
breastfeeding	39/62 (62.9)[e]	33/54 (61.1)[e]	
bottle feeding	11/62 (17.7)[e]	9/54 (16.7)[e]	
combination	12/62 (19.4)[f]	12/54 (22.2)[e]	
Composite neonatal outcome[a,b]	4 (5.7)	6 (8.5)	.381

All variables are in mean±SD, median (interquartile range) or n (%). Unless stated otherwise, n and % are calculated excluding missing data.
Abbreviations: CI, confidence interval; CS, cesarean section; NICU: Neonatal Intensive Care Unit; RR, relative risk.
[a] Non-normally distributed data, reported in median (IQR)
[b] Neonatal composite outcome: Apgar after 5 minutes <7, Ph <7,05, admission to NICU
[c] Two participants missing
[d] Three participants missing
[e] Four or more participants missing, exact number listed

DISCUSSION

The results of this study support our hypothesis that EMDR therapy is not associated with more obstetric or neonatal complications than CAU. Conversely, the results were not supportive of our second hypothesis in that EMDR therapy did not result in a lower percentage of cesarean sections or more positive childbirth experiences compared to CAU. An unexpected finding was that seven times more women in the CAU group received induction of labor at maternal request without medical indication.

Although, as far as we are aware, no previous randomized controlled study has ever investigated neonatal outcomes before, our results are in line with the limited number of previous studies that evaluated obstetric outcomes after treatments for FoC in pregnant women, showing no increase in adverse perinatal events or cesarean sections after treatment for FoC[13,28]. This supports the notion that EMDR therapy for pregnant women with FoC does not lead to obstetric complications.

Contrary to our hypothesis, we found no reduction in the percentage of cesarean sections in the EMDR therapy group compared to the CAU group. Although this result is at odds with several previous studies that found a reduction in cesarean sections after treatment aimed at reducing FoC[12,13], it corresponds to some other studies showing no effect[29,30]. An example of the latter is a study by Fenwick et al[29], who found an overall percentage of cesarean sections of 34% for the psycho-education group versus 42% for the usual maternity care group (p=.27), with a planned cesarean rate of 16%. The fact that no difference was found between the two conditions in any of the primary outcome variables[16], could explain why no differences in the proportion of performed cesarean sections were found between the EMDR therapy and the CAU condition.

We did not expect to find such a high percentage of both planned and unplanned cesarean sections in our study, which is much higher than the Dutch general population based on the Dutch national obstetric database (planned cesarean sections 19.6% versus 9.2%, unplanned cesarean sections 17.9% versus 8.5%, respectively; Perined, 2020). Further analyses among subgroups of our study regarding parity and planned versus unplanned cesarean section showed that in almost all the subgroups the cesarean rates were higher compared to the general population, and only the percentage of unplanned cesarean sections in multiparous women was comparable with that of the general population (5.8% vs. 4.8%; Perined, 2020). A possible explanation may be that FoC during pregnancy is known to be accompanied by an increased risk of adverse obstetric outcomes. Compared to a general (medium/high risk) Dutch hospital setting, in addition to a higher risk of cesarean section, we also found that our sample had a relatively high percentage of preterm births (13% versus 9%; Perined, 2020). There may be a selection bias because our study included relatively more pregnant women from a medium/high-risk hospital setting than the Dutch general pregnant population. However, this cannot explain the high percentage cesarean sections: the overall percentage cesarean sections in hospital setting in the national database is 24% (Perined, 2020), which corresponds with the including hospital, and does not explain the 37.2% in our sample. Another potential factor that could have contributed to the high percentage of cesareans and preterm births is the high percentage of women who conceived through fertility treatments such as ovulation induction, intra-uterine insemination, in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI). There is growing evidence that women who conceived after fertility treatment show an elevated risk of obstetric complications, including cesarean section (RR 1.56) and preterm birth (OR 1.93 <37 gestational weeks, OR 3.27 <32 gestational weeks)

[31].Our study found that 13.5% of participants conceived after receiving fertility treatment, which is substantially higher than the 3.4% fertility treatment rate observed in the Netherlands during the middle year of our inclusion period 2017 (Perined, 2017). However, it should be noted that 48.5% of the conception methods in these national Perined data are missing. Therefore, it is not possible to accurately estimate the percentage of Dutch pregnant women who conceived through fertility treatment, but the percentage was very likely to be significantly lower than in our study.

The current study found a significant reduction in elective inductions of labor at maternal request in the EMDR group compared to that in the CAU group. It is known that the presence of FoC is associated with so called non-urgent obstetric interventions, such as induction of labor, planned cesarean sections and pain relief on maternal request without other medical indication[13,32]. Despite the fact that, based on questionnaire research, indications have been found for a reduction in preferences for such non-urgent obstetric interventions, in clinical practice no actual measured reduction of these interventions after treatment for FoC has been demonstrated[12,29].

The current RCT provides the first comprehensive assessment of obstetric and neonatal outcomes in pregnant women with FoC who received EMDR therapy compared with those with CAU. Intervention studies on FoC that evaluate obstetric outcomes are scarce. In our study all pregnant women were screened, and women were included from both hospital (medium/high risk) and community midwifery practices (low risk) settings. This resulted in the inclusion of both low and high-risk pregnancies, thereby enhancing generalizability. The choice of the widely translated and validated WDEQ-A enabled the comparison of our population with other studies. However, there are several limitations of the present study that need to be mentioned as well. First, there is no third arm including matched controls from other organisations to rule out the possibility that differences in care (rather than only in pregnant women) contributed to the outcomes. It is possible that, as a result of hospitals and practices participating in this study and caregivers receiving educational introduction presentations, awareness of FoC-informed maternity care has improved. Related to this, the fact that there is no gold standard treatment for FoC available yet, may explain the high number of women in the CAU group who initiated treatment for FoC themselves (21.4%). Second, simply participating in the study, including undergoing the screening procedure and two comprehensive clinical interviews, may have had positive effects on the women in the CAU group. Both educated healthcare providers and personal attention during research appointments may have improved the care and thereby outcomes for the CAU-group. Finally, our study population was predominantly comprised of highly educated and cohabiting/married participants from a high-income country with good public health services.

The findings of the current study have important implications for clinical practice, as clinicians (both mental health professionals and obstetricians/midwives) should refrain

from being reluctant to conduct EMDR therapy in pregnant women with FoC. Given the lack of studies evaluating the induction of labor at maternal request, future studies should include women requesting induction of labor without a medical indication, assessing the reasons for this, and determining the effectiveness of EMDR therapy, including its obstetric outcomes.

CONCLUSION

Although the present study showed no reduction in cesarean sections or more positive experiences of childbirth, the results provide support for the notion that applying EMDR therapy during pregnancy does not adversely affect pregnancy outcomes or the unborn child. More importantly the application of EMDR therapy was found to be associated with fewer maternal requests for labor induction without medical indication compared to CAU. Therefore, therapists should not be reluctant to treat pregnant women with FoC using EMDR therapy.

Funding information

The OptiMUM-study received grants from the Stichting EMDR Nederland (Dutch EMDR Association), Fonds Gezond Geboren, Stichting Teaching Hospital OLVG, and Stichting Wetenschap OLVG, all awarded to the principal investigator MvP.

REFERENCES

1. van Heumen MA, Hollander MH, van Pampus MG, van Dillen J, Stramrood CAI. Psychosocial Predictors of Postpartum Posttraumatic Stress Disorder in Women With a Traumatic Childbirth Experience. Front Psychiatry. 2018;9(July):1–9.
2. Söderquist J, Wijma B, Thorbert G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. Br J Obstet Gynaecol. 2009;116(5):672–80.
3. Raïsanen S, Lehto SM, Nielsen HS, Gissler M, Kramer MR, Heinonen S. Fear of childbirth in nulliparous and multiparous women: a population-based analysis of all singleton births in Finland in 1997-2010. Br J Obstet Gynaecol. 2014;121(8):965–70.
4. Størksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective cesarean section: a population-based study. BMC Pregnancy Childbirth. 2015;17(15):221.
5. Sanni KR, Eeva E, Noora SM, Laura KS, Linnea K, Hasse K. The influence of maternal psychological distress on the mode of birth and duration of labor: findings from the FinnBrain Birth Cohort Study. Arch Womens Ment Health. 2022;25(2):463–72.
6. Lima SAM, El Dib RP, Rodrigues MRK, Ferraz GAR, Molina AC, Neto CAP, et al. Is the risk of low birth weight or preterm labor greater when maternal stress is experienced during pregnancy? A systematic review and meta-analysis of cohort studies. PLoS One. 2018;13(7):1–15.
7. Grigoriadis S, Graves L, Peer M, Mamisashvili L, Tomlinson G, Vigod SN, et al. Maternal Anxiety During Pregnancy and the Association With Adverse Perinatal Outcomes: Systematic Review and Meta-Analysis. J Clin Psychiatry. 2018;79(5):17r12011.
8. Stein A, Pearson R, Goodman S, Rapa E, Rahman A, McCallum M, et al. Effects of perinatal mental disorders on the fetus and child. Lancet. 2014;384(9956):1800–19.
9. Alder J, Fink N, Bitzer J, Hösli I, Holzgreve W. Depression and anxiety during pregnancy: A risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. J Matern Neonatal Med. 2007;20(3):189–209.
10. Staneva A, Bogossian F, Pritchard M, Wittkowski A. The effects of maternal depression, anxiety, and perceived stress during pregnancy on preterm birth: A systematic review. Women Birth. 2015;28(3):179–93.
11. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Ryding EL, et al. Group psychoeducation with relaxation for severe fear of childbirth improves maternal adjustment and childbirth experience – a randomised controlled trial. J Psychosom Obstet Gynaecol. 2015;36(1):1–9.
12. Rouhe H, Salmela-Aro K, Toivanen R, Tokola M, Halmesmäki E, Saisto T. Obstetric outcome after intervention for severe fear of childbirth in nulliparous women - randomised trial. Br J Obstet Gynaecol. 2013;120(1):75–84.
13. Veringa-Skiba IK, de Bruin EI, van Steensel FJA, Bögels SM. Fear of childbirth, nonurgent obstetric interventions, and newborn outcomes: A randomized controlled trial comparing mindfulness-based childbirth and parenting with enhanced care as usual. Birth. 2022;49(1):40–51.
14. Toohill J, Fenwick J, Gamble J, Creedy DK, Buist A, Turkstra E, et al. A Randomized Controlled Trial of a Psycho-Education Intervention by Midwives in Reducing Childbirth Fear in Pregnant Women. Birth. 2014;41(4):384–94.

15. Burger H, Verbeek T, Aris-Meijer JL, Beijers C, Mol BW, Hollon SD, et al. Effects of psychological treatment of mental health problems in pregnant women to protect their offspring: randomised controlled trial. Br J Psychiatry. 2020;216(4):182–8.

16. Baas MAM, van Pampus MG, Stramrood CAI, Dijksman LM, Vanhommerig JW, de Jongh A. Treatment of pregnant women with Fear of Childbirth using EMDR therapy: results of a multicentre randomized controlled trial. Front Psychiatry. 2022;10(12):798249.

17. Baas MAM, Stramrood CAI, Dijksman LM, de Jongh A, van Pampus MG. The optiMUM-study: EMDR therapy in pregnant women with posttraumatic stress disorder after previous childbirth and pregnant women with fear of childbirth: Design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1).

18. Baas MAM, van Pampus MG, Braam LM, Stramrood CAI, de Jongh A. The effects of PTSD treatment during pregnancy: systematic review and case study. Eur J Psychotraumatol. 2020;11(1):1762310.

19. Garthus-Niegel S, Størksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol. 2011;32(3):160–3.

20. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry. 1998;59:34–57.

21. de Jongh A, ten Broeke E. Handboek EMDR: Een geprotocolleerde behandelmethode voor de gevolgen van psychotrauma. Pearson Assessment and Information; 2019.

22. Shapiro F. Eye movement desensitization and reprocessing (EMDR) therapy: Basic principles, protocols, and procedures. 3rd ed. New York, NY, US: Guilford Press; 2018.

23. De Jongh A, Matthijssen S, Brouwers T, Roozendaal T van, Vuister C. The effect of EMDR versus EMDR 2.0 on emotionality and vividness of aversive memories in a non-clinical sample. Eur J Psychotraumatol. 2021;12(1):1956793.

24. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84–97.

25. Calderani E, Giardinelli L, Scannerini S, Arcabasso S, Compagno E, Petraglia F, et al. Tocophobia in the DSM-5 era: Outcomes of a new cut-off analysis of the Wijma delivery expectancy/experience questionnaire based on clinical presentation. J Psychosom Res. 2019;116.

26. Truijens SEM, Wijnen HA, Pommer AM, Oei SG, Pop VJM. Development of the Childbirth Perception Scale (CPS): perception of delivery and the first postpartum week. Arch Womens Ment Health. 2014;17(5):411–21.

27. Nederlandse Vereniging voor Obstetrie en Gynaecologie. NVOG-richtlijn Hemorrhagia postpartum. 2013;1–19. Available from: www.nvog.nl

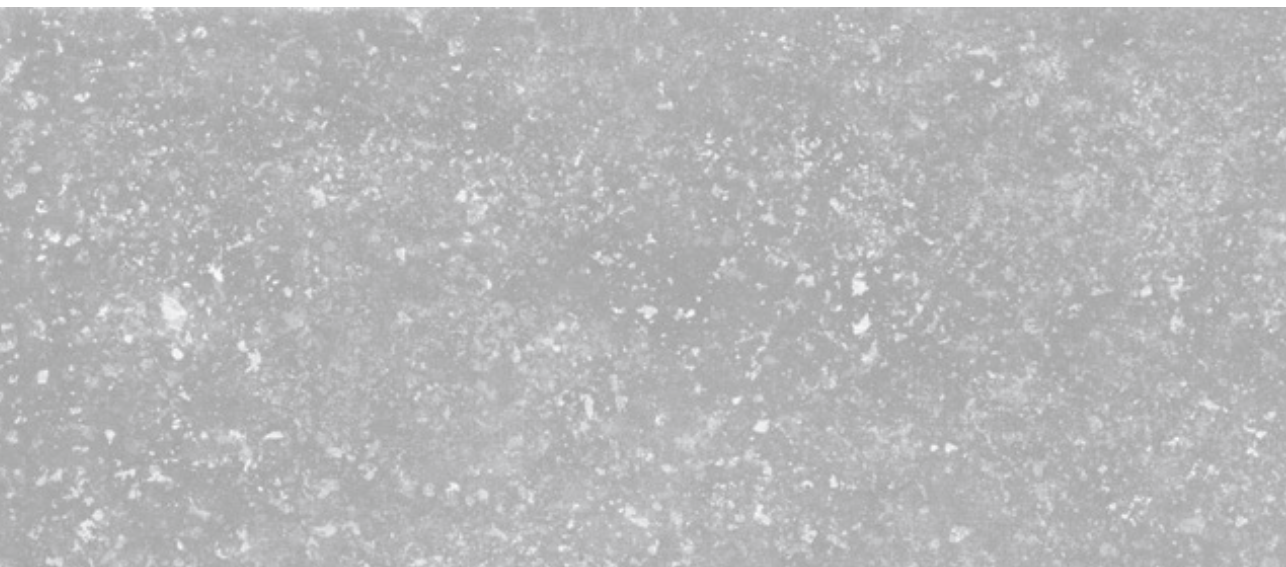
28. Klabbers GA, Wijma K, Paarlberg KM, Emons WHM, Vingerhoets AJJM. Haptotherapy as a new intervention for treating fear of childbirth: a randomized controlled trial. J Psychosom Obs Gynaecol. 2019;40(1):38–47.

29. Fenwick J, Toohill J, Gamble J, Creedy DK, Buist A, Turkstra E, et al. Effects of a midwife psycho-education intervention to reduce childbirth fear on women's birth outcomes and postpartum psychological wellbeing. BMC Pregnancy Childbirth. 2015;15.

30. Saisto T, Salmela-Aro K, Nurmi JE, Könönen T, Halmesmäki E. A randomized controlled trial of intervention in fear of childbirth. Obstet Gynecol. 2001;89(5):820–6.

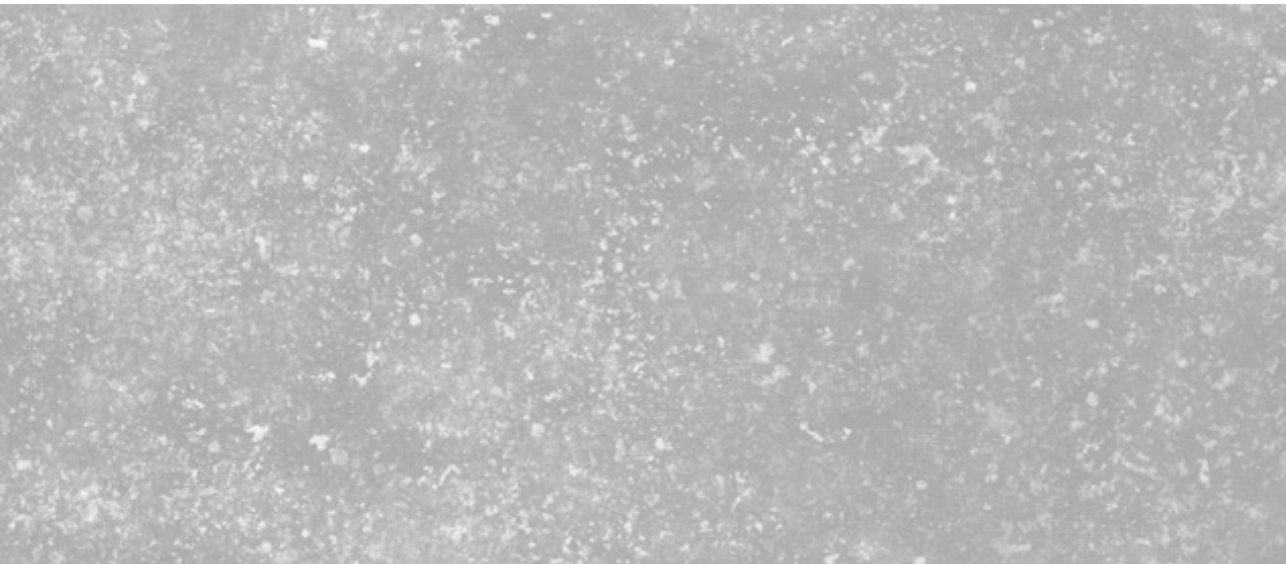
31. Palomba S, Homburg R, Santagni S, La Sala GB, Orvieto R. Risk of adverse pregnancy and perinatal outcomes after high technology infertility treatment: A comprehensive systematic review. Reprod Biol Endocrinol [Internet]. 2016;14(1):1–25. Available from: http://dx.doi.org/10.1186/s12958-016-0211-8

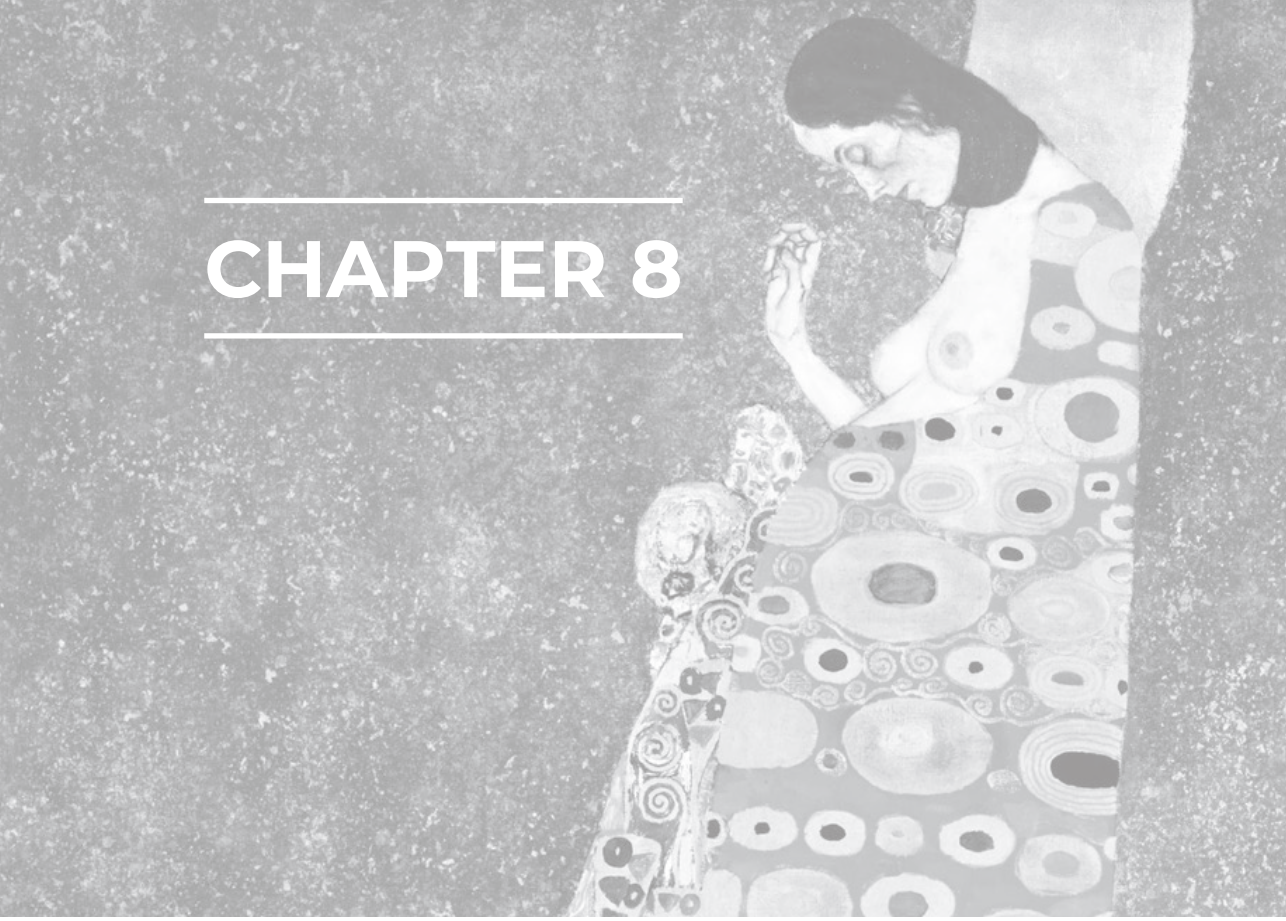
32. Sydsjö G, Sydsjö A, Gunnervik C, Bladh M, Josefsson A. Obstetric outcome for women who received individualized treatment for fear of childbirth during pregnancy. Acta Obstet Gynecol Scand. 2012;91(1):44–9.



PART III

HEALTCHARE PROVIDERS





CHAPTER 8

Work-related adverse events leaving their mark: a cross-sectional study among Dutch gynecologists

Baas MAM, Scheepstra KWF, Stramrood, CAI, Evers, R, Dijksman, LM, van Pampus MG. Work-related adverse events leaving their mark: a cross-sectional study among Dutch gynecologists**.** BMC Psychiatry. 2018;18(1):73. doi: 10.1186/s12888-018-01659-1.

ABSTRACT

Background

Health care professionals who are frequently coping with traumatic events have an increased risk of developing a posttraumatic stress disorder. Research among physicians is scarce, and obstetrician-gynecologists may have a higher risk. Work-related traumatic events and posttraumatic stress disorder among obstetricians-gynecologists and the (desired) type of support were studied.

Methods

A questionnaire was emailed to all members of the Dutch Society of Obstetrics and Gynaecology, which included residents, attending, retired and non-practicing obstetricians-gynecologists. The questionnaire included questions about personal experiences and opinions concerning support after work-related events, and a validated questionnaire for posttraumatic stress disorder.

Results

The response rate was 42.8% with 683 questionnaires eligible for analysis. 12.6% of the respondents have experienced a work-related traumatic event, of which 11.8 % met the criteria for current posttraumatic stress disorder. This revealed an estimated prevalence of 1.5% obstetricians-gynecologists with current posttraumatic stress disorder. 12% reported to have a support protocol or strategy in their hospital after adverse events. The most common strategies to cope with emotional events were: to seek support from colleagues, to seek support from family or friends, to discuss the case in a complication meeting or audit and to find distraction. 82% would prefer peer-support with direct colleagues after an adverse event.

Conclusions

This survey implies that work-related events can be traumatic and subsequently can lead to posttraumatic stress disorder. There is a high prevalence rate of current posttraumatic stress disorder among obstetricians-gynecologists. Often there is no standardized support after adverse events. Most obstetrician-gynecologists prefer peer-support with direct colleagues after an adverse event. More awareness must be created during medical training and organized support must be implemented.

INTRODUCTION

Professionals frequently coping with traumatic events have an increased risk of developing a posttraumatic stress disorder (PTSD). Groups at risk include military personnel, rescue workers, police, firefighters, and ambulance personnel. Similarly, hospital physicians cope with events such as severe illness, life-threatening situations and death frequently[1,2]. However, research about traumatic events and PTSD among hospital physicians is scarce, and as a result the effects of work-related traumatic events may be underestimated. Overall, mental health problems in health care professionals may jeopardize the safety and quality of health care provided, with decreased productivity[3], high collateral costs[4], and medical errors[5–7]. Fortunately, the importance of physicians own mental health to foster optimal patient care is emphasized as a new competency in the CanMEDS framework[8]. The widely used CanMEDS framework was developed to define the necessary competencies for physicians. It provides a comprehensive foundation for medical education and practice for many (future) physicians in a dozen countries. Obstetrician-Gynecologists (ObGyns) may be at increased risk of experiencing traumatic events since pregnancy and childbirth are expected to be joyful times, but can include severe complications, including stillbirth or maternal death with high emotional impact on the physician, midwife or nurse[9–13].

Posttraumatic stress disorder

Whereas many types of work-related events can be marked as adverse, not all adverse events are traumatic. A traumatic event according to DSM-IV (Diagnostic and Statistical Manual of Mental Disorders)[14] is to experience or directly witness actual or threatened death, serious injury or a threat to the physical integrity of themselves or others. Furthermore, it was obligatory that the response involved intense fear, helplessness or horror. In the recently published fifth version of the DSM[15] this last criterion is removed, since it proved to have no utility in predicting the onset of PTSD. In particular, professionals did not always have these emotions at time of the event, while they did develop PTSD symptoms[16]. Furthermore, in the DSM-5, criterion A4 is added, specifically concerning professionals who have never been in direct danger, but can learn about consequences of traumatic events as part of their job[16].

Not all who experience a traumatic event develop PTSD: 80% of the general Dutch population will experience at least one traumatic event during their life, with a lifetime prevalence rate of PTSD being 7.4%[17]. A traumatic event can lead to a period of posttraumatic stress symptoms with intrusions, avoidance, negative cognitions and mood, and hyperarousal, but often these symptoms decline. When these symptoms last for at least one month, and lead to significant impairment in social, occupational or other important areas of functioning, PTSD can be diagnosed[15]. Risk factors for developing PTSD after experiencing a traumatic event include female gender, poor social support, prior trauma exposure, prior mental disorder and continuing stressors[18].

Second victims

In 2000, the term second victim was introduced to address the impact of work-related adverse events on health care professionals[19]. Second victims can be defined as *"healthcare providers who are involved in an unanticipated adverse patient event, in a medical error and/or a patient related injury and become victimized in the sense that the provider is traumatized by the event"*[20]. The reported prevalence of second victims among health care providers varies from 10.4% to 46%[21–24]. The second victim can have continued emotional distress, leading to a posttraumatic stress disorder.

Studies about traumatic events and PTSD among health care professionals in general have low response rates and show a widely varying prevalence of PTSD or PTS-symptoms[1]. Studies among midwives, labor ward nurses and obstetricians reported a prevalence of moderate to severe work-related PTS-symptoms of 26-36%, with the most frequently reported traumatic events being fetal demise/neonatal death, shoulder dystocia (obstetric emergency during vaginal delivery that requires additional obstetric manoeuvres to deliver the fetus after the head has been born. It is associated with perinatal morbidity and mortality), and infant resuscitation[25–27].

Support and coping after adverse events

It is unknown how many Dutch hospitals have implemented support strategies for health care professionals, but the absence of these strategies in many high risk specialties, such as anesthesiology is experienced as a common problem[28]. In addition, there is a low likelihood of a physician asking for help, due to perceived barriers (doubts about confidentiality, fear of negative impact on career, stigma[29], a low awareness of support options and time constraints[30]).

More is known about the coping strategies of health care professionals after adverse events. The five most common coping mechanisms among American obstetricians are: asking support from a colleague, asking support from family or friends, exercising or performing hobbies, writing a formal case report or undertaking religious activities[10]. Other research supports this finding that physicians mainly wish for peer-support from colleagues after adverse events[30].

Aim of the study

The aim of this study was to study the prevalence of work-related traumatic events (according to the DSM-IV A-criterion for posttraumatic stress disorder) among ObGyns, and to describe the prevalence of PTSD among ObGyns. Furthermore, we explored the current coping and professional support after work-related adverse events and the desired type of support. It was hypothesized that work-related events could be traumatic and lead to PTSD among ObGyns and current coping and support would be considered insufficient.

MATERIAL AND METHODS

Population and procedure

The current study used the membership database of the Dutch Society of Obstetrics & Gynecology (NVOG). Permission to access and use this non-public database was granted by the NVOG. This database includes all resident and attending ObGyns in the Netherlands, as well as retired and non-practicing ObGyns. Of the 1596 members, 1578 members with a registered email address were included, which equals 98.9% of the NVOG population. Since the database did not differentiate between retired and non-practicing ObGyns, we considered all non-working ObGyns younger than 60 years into ObGyns with other jobs, and non-working ObGyns older than 60 years as retired. The link to the questionnaire was sent by email using an anonymous (non-traceable) link. All physicians received an invitation to participate in March 2014 by email, and two reminders during a 7.5 week period. The survey was piloted among a small group of resident and attending ObGyns for face validity, after which no substantial changes were made.

Measurements

The survey consisted of 32 questions, starting with demographics (5 questions), personal experiences about work-related adverse events, coping and support provided (12 questions), desired support (2 questions) and one statement question. Lastly, when a work-related traumatic event was experienced during their career (PTSD-criterion A according to DSM-IV, 2 questions), at least once and more than four weeks ago, they also completed the Trauma Screening Questionnaire (TSQ)[31]. The TSQ is a validated 10-item screening instrument corresponding to a provisional diagnosis of PTSD according to the DSM-IV[14]. The Dutch psychometric properties are validated with Cronbach's alphas from 0.71 to 0.91. A cut-off value of 6 or higher was used[32]. The original Dutch questionnaire and the English translation are included as additional files to this manuscript. The survey was part of a larger questionnaire among ObGyns about mental health after work-related adverse events.

Statistical analysis

Descriptive and statistical analyses were performed with SPSS 18.0 for Windows. For the 4-point Likert scale questions, median scores for central tendency, interquartile range (IQR, 25%-75%) and frequencies for distribution were calculated. Independents t-tests (for continuous variables) or Fisher's exact tests (for categorical variables) were used to compare subgroups. All variables are reported with numbers (%) or mean ± standard deviation. A *p*-value of less than .05 was considered statistically significant. Open answers were independently categorized by two authors (KS and MB), and subsequently analyzed by two independent assessors(KS, MS). Any disagreement was discussed until consensus was achieved. The overall interrater reliability was moderate, with Cohen's kappa's of 0.44 or higher[33].

RESULTS

Respondent and population characteristics

Table 1 shows the characteristics of the respondents (n=683) and reference population. The sample was found to be a good representation of the NVOG members, as the response rates in the subgroups (age, gender, level of training) corresponded to the overall NVOG population. Of all the residents (n=394), 184 (47.8%) responded, so the highest response rate was among residents, followed by attending ObGyns (45.7%). Retired and non-practicing ObGyns had a response rate of 25.3%. The majority of the respondents were female (65.3%), with a varying distribution among the subgroups. The percentages varied from 85% female residents to 14% female among retired ObGyns. This distribution corresponded to the tendency of having an increasing amount of young female medical doctors in the Netherlands. Work experience in obstetrics and gynecology ranged from 0.5 to 46.0 years. The respondent demographics are shown in table 2.

Table 1 Demographic characteristics of respondents and NVOG population

Variable	Respondents N=683	NVOG population N=1596
ObGyn		
Resident	184 (26.9)	394 (24.7)
Attending	442 (64.7)	975 (61.1)
Non-practicing	21 (3.1)	18 (1.1)*
Retired	36 (5.3)	209 (13.1)*
Gender		
Male	237 (34.7)	663 (41.5)
Female	446 (65.3)	933 (58.5)
Age		
25-34	155 (22.7)	329 (21.2)
35-44	211 (30.9)	433 (27.9)
45-54	152 (22.3)	339 (21.8)
55-64	115 (16.8)	258 (16.6)
65 and older	50 (7.3)	194 (12.5)
Years in practice		
Mean ± SD	17.4 ± 10.7	Unknown
Range	0.5-46	Unknown
Complaints at disciplinary board	144 (21.1)	Unknown

All variables are in number (%), or mean ± standard deviation.

*Calculated numbers. The NVOG did not differentiate between retired and not-practicing ObGyns. We counted ObGyns younger than 60 years as non-practicing, older than 60 years as retired.

Table 2 Demographic variables per subgroup

	Total (*n*=683)	**Resident (*n*=184)**	**Attending (*n*=442)**	**Non-practicing (*n*=21)**	**Retired (*n*=36)**
Gender					
Male	237 (34.7)	27 (14.7)	165 (37.3)	14 (66.7)	31 (86.1)
Female	446 (65.3)	157 (85.3)	277 (62.7)	7 (33.3)	5 (13.9)
Age					
25-34	155 (22.7)	146 (79.3)	9 (2.0)	0	0
35-44	211 (30.9)	38 (20.7)	169 (38.2)	1 (4.8)	3 (8.3)
45-54	152 (22.3)	0	149 (33.7)	3 (14.3)	0
55-64	115 (16.8)	0	107 (24.2)	6 (28.6)	2 (5.6)
65 and older	50 (7.3)	0	8 (1.8)	11 (52.4)	31 (86.1)
Years in practice					
Mean ± SD	17.4 ± 10.7	5.3 ± 2.4	20.6 ± 8.3	29.5 ± 9.3	32.4 ± 7.9
Complaints at the disciplinary board	144 (21.1)	3 (1.6)	118 (26.7)	8 (38.1)	15 (41.7)

All variables are in number (%), or mean ± standard deviation.

Posttraumatic stress disorder

The outcomes of the TSQ are shown in table 3. 86 (12.6%) of the respondents reported having experienced at least one traumatic event during their work as an ObGyn and thereby met DSM-IV criterion A. One of them did not continue answering the TSQ, leading to 85 respondents completing the TSQ. 10 (11.8%) subjects screened positive for a current PTSD diagnosis. This equaled a prevalence of 1.5% among all ObGyns, and 1.4% among the ObGyns that are currently practicing (residents and attending). Among the remaining 75 ObGyns without current PTSD who did experience a traumatic event, 60.0% reported having experienced multiple work related PTS-symptoms earlier in their career. The sample size was not large enough to perform subgroup analysis on PTSD or PTS-symptoms earlier in life. The most commonly reported adverse events were neonatal death, maternal death, severe neonatal and maternal complications, patient aggression or violence towards healthcare professionals, medical errors and interpersonal conflicts with colleagues. Twenty-one respondents mentioned they did not wish to describe the traumatic event because of fear of loss of anonymity, three were not applicable (did not describe an event).

Table 3 Posttraumatic stress disorder measurements

	Total (*n*=683)	Practicing (*n*=626)		Not practicing (*n*=57)	
		Resident (*n*=184)	Attending (*n*=442)	Other job (*n*=21)	Retired (*n*=36)
PTSD					
DSM-IV criterion A (%)	86 (12.6)	14 (7.6)	67 (15.2)	3 (14.3)	3 (8.3)
Above cut-off* (%)	10 (1.5)	1 (7.1)	8 (12.1)	0 (0.0)	1 (33.3)

All variables are in number (%) of mean ± standard deviation.
* Measured with a a TSQ cut-off value of 6 or higher. TSQ was completed by *n*=85.

Work-related emotional stressors

Of all ObGyns, 230 (33.7%) have at some point considered leaving their medical profession. The most common reasons were a high workload, varying shifts, high responsibility, work/life imbalance, conflicts with colleagues, new interests and work culture related problems. 21.1% reported having faced a complaint at the disciplinary board, and this percentage increased with years in practice: 1.6% of the residents, 26.7% of the attending, 38.1% of the non-practicing and 41.7% of the retired ObGyns (table 2). The group that had considered leaving the profession had a significantly higher PTSD prevalence rate (0.7% vs 3.0%, p=0.01).

Respondents experienced the following events as high emotional impact stressors: missing a diagnosis (64.3%), doubting a medical decision (44.5%), life-threatening moments (43.2%), death of a patient (37.6%), feeling they could not help the patient (24.3%), bad news conversations (16.1%) (figure 1). Other stressors reported (23.1%) included severe complications, conflicts with colleague, patient and disciplinary board complaints, discontented patients and patient aggression or violence.

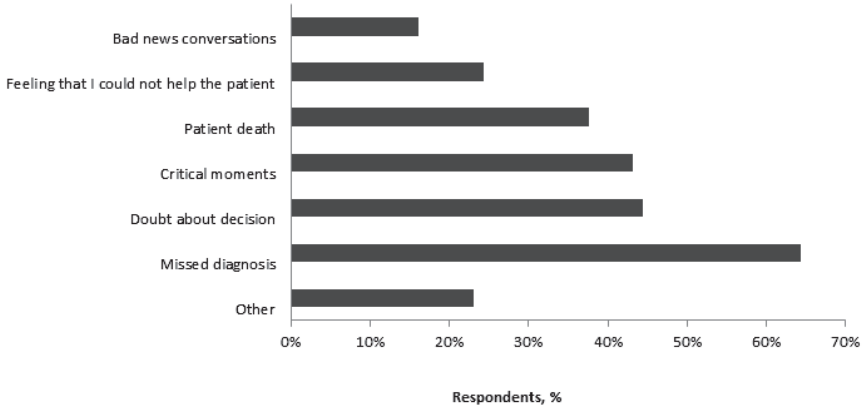


Figure 1. Events with high emotional impact

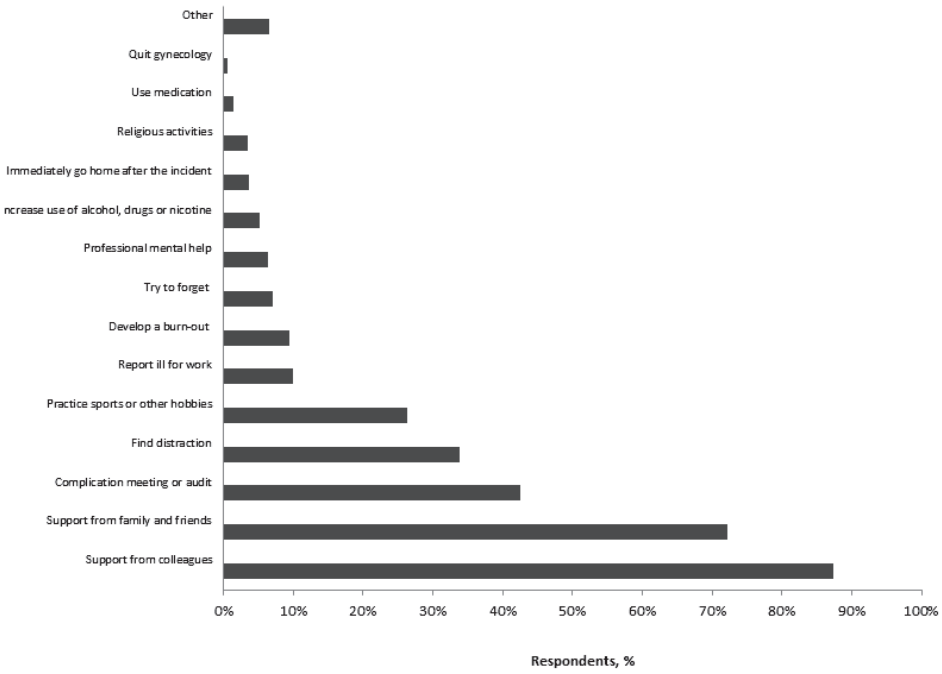


Figure 2. Coping strategies

Coping

The most commonly used coping strategies after emotional events (figure 2) were gaining support from colleagues (87.4%), gaining support from family or friends (72.2%), discussing the case in a complication meeting or audit (42.6%), finding distraction (33.8%) and practicing sports or other hobbies (26.4%). Among the respondents, 5.1% increased their use of alcohol, drugs and/or nicotine and 1.5% used medication they normally would not use. Furthermore, 0.6% gave up practicing as an ObGyn as a result of emotional stressors. When asked where they learned their coping strategies, 53% reported never having formally learned, 22.5% during a peer support group, 10.5% during specialist training, 4.8% during medical school, 4.8% during additional specialist courses and 33.8% learned through other ways. With the statement that there is room to express emotions on the ward or within their department after experiencing an emotional event, 80.8% agreed. Not many ObGyns (4.8%) agreed with the statement that having sleepless nights due to an adverse event means that you are not made to be an ObGyn. One in two ObGyns (55.2%) of the respondents have become more defensive in their decision making and 24.4% changed their work habits as a result of adverse events (e.g. no longer doing nightshifts, not performing surgery alone or no longer performing vaginal breech deliveries).

Current and desired support

Of all ObGyns, 410 (60.0%) thought the current support services after adverse events are insufficient. Of these 410 respondents, 255 (62.3%) reported that their department or hospital has no support protocol or strategy, 105 (25.7%) were not aware whether there is a protocol and 49 (12.0%) do have a protocol. When asked about preferences for support after an adverse event, most ObGyns (82.0%) would prefer peer support from direct colleagues. 29.9% would like support from a professional (psychologist or counsellor), 22.3% would prefer peer support from indirect colleagues (non-ObGyn physicians) and 10% would like to have a buddy appointed. 86.1% stated that the culture concerning the support after adverse events should change.

DISCUSSION

In this large-scale study with a good response rate, our work-related PTSD prevalence among ObGyns (1.5%) is comparable to the general prevalence rate of current PTSD in the Netherlands (1.3%)[17]. However, this common prevalence is mostly not work-related, and with this in mind we conclude the work-related prevalence of PTSD among ObGyns is high compared to the general Dutch population. On the other hand, our estimated prevalence rate is low compared to other studies on prevalence rates of posttraumatic stress among health care professional in general (10.4-43.3%)[7,21–24] and labor and delivery ward personnel (32-36%)[25–27]. However, a variety in definitions, questionnaires, stressor criterions, countries and professions is making comparison of results difficult. For instance, only one research group tried to determine a presumptive diagnosis of PTSD instead of posttraumatic stress in general, by applying the DSM-IV symptomcluster criteria to the Secondary Traumatic Stress Scale[25,27]. It is needless to say that ObGyns who did not meet full criteria for PTSD may still have significant impairment, and it is important to look beyond a DSM-diagnosis.

Among the ObGyns without current PTSD who did experience a traumatic event, 59.2% report having experienced multiple work-related PTS-symptoms earlier in their career. Unfortunately, due to the retrospective aspect of this study, we cannot differentiate between physiological adaption, an Acute Stress Disorder or previous PTSD. Nonetheless, we conclude that psychological distress after a work-related adverse event is common.

While the CanMEDS framework is used during medical training in the Netherlands, the current study implies that coping and support are not learned during specialist training. Of the Dutch ObGyns, 60% think that the current support strategies are insufficient and only 12% reports that support services are available in their hospital/department. This corresponds to recent studies in which the institutional support for hospital-based physicians or nurses is considered low, and most support was to be expected from colleagues, family and friends[34–37]. With strong social support being an important protective factor for PTSD and gathering social support being a common coping

mechanism in our sample, the role of educating health care professionals to support their colleagues after adverse events is crucial.

As a consequence of adverse events, ObGyns may become more defensive, adjust their work conditions and consider quitting their profession. One third of all Dutch ObGyns considered giving up gynecological practice, which is higher than findings from prior research (1 in 10)[10]. However, in the present study the questions about considering giving up practicing did not differentiate between this being due to experiencing adverse events or because of other reasons. The results of this current study confirmed self-medication with (increased use of) drugs, nicotine and/or medication after experiencing an adverse event[23,38] as a coping style used by some physicians after experiencing an adverse work-related event.

In accordance with prior research,[30] situations described as high emotional impact are not necessarily the most extreme cases. Some physicians experience (multiple) minor complications as traumatic, whereas others experience disciplinary complaints or conflicts with colleagues as more stressful. We consider work conflicts and patient aggression or violence as work-related adverse events as well. These may concern all health care professionals and we therefore emphasize some form of support or guidance after such events as well.

Strengths and limitations

One of the strengths of this study includes the large sample size (n=683), as well as a high response rate of 42.8%. Although a recent study among Danish obstetricians and midwives about feelings and concerns after traumatic childbirth reached an even high response rate (59%)[39], our response rate is considerably higher than some previous studies (5-16%)[25–27]. There are also several limitations to this study. Since avoidance is inherent to PTSD and may lead to non-response, the PTSD-prevalence of 1.5% may be an underestimation. Due to the anonymous design of the study, a non-responder analysis was not possible. Secondly, PTSD criterion A was measured according to DSM-IV, in which experiencing intense fear, helplessness or horror right after the event was still required for a PTSD-diagnosis. In the DSM-5 this criterion has been removed, which is of particular interest since during work-related traumatic events there is often ‘the professional kicking in’, and emotions are postponed or neglected. This could have led to underdiagnosing traumatic events and thereby work-related PTSD. Another limitation is that a clinical interview is necessary for diagnosing PTSD, and therefore the prevalence rate in our study is an estimated prevalence.

Implications and recommendations

For future research, we would advise to include questions about the time that has passed since the traumatic event, and to include possible confounders for developing PTSD after

experiencing a traumatic event[40], which could help identifying and supporting high-risk individuals. If possible, a longitudinal design would be of great interest.

We suggest that all hospitals increase awareness among residents and attending physicians, and standardized support after adverse events should be implemented. Also, education on coping strategies should be expanded in medical training, to optimize peer support by colleagues.

Lastly, we suggest further evaluation of the most effective support methods and the effect on quality and safety of health care. We stimulate exploration of this topic among other medical specialties as well, since adverse events concern most health care professionals.

CONCLUSION

This is the first large-scale study about work-related adverse events, coping, support and PTSD among Dutch ObGyns. Findings imply that there is a substantial group of ObGyns who experienced at least one work-related traumatic event (according to the DSM-IV criteria for PTSD), and that this can lead to work-related PTSD. As hypothesized, it was found that respondents consider the support after adverse events to be insufficient, and coping is not learned during medical and specialist training. There is potential for a change of culture, and creating a professional peer support system.

REFERENCES

1. Robertson N, Perry A. Institutionally Based Health Care Workers ' Exposure to Traumatogenic Events : Systematic Review of PTSD Presentation. J Trauma Stress. 2010;23(3):417–20.
2. Coby J, Boer D, Lok A, Van E, Duivenvoorden HJ, Bakker AB, et al. Work-related critical incidents in hospital-based health care providers and the risk of post-traumatic stress symptoms, anxiety, and depression : A meta-analysis. Soc Sci Med [Internet]. 2011;73(2):316–26. Available from: http://dx.doi.org/10.1016/j.socscimed.2011.05.009
3. Dewa CS, Loong D, Bonato S, Thanh NX, Jacobs P. How does burnout affect physician productivity? A systematic literature review. BMC Heal Serv Res. 2014;14:325.
4. Dewa CS, Jacobs P, Thanh NX. An estimate of the cost of burnout on early retirement and reduction in clinical hours of practicing physicians in Canada. BMC Heal Serv Res. 2014;14:254.
5. Shanafelt TD, Bradley KA, Wipf JE B AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med. 2002;136(5):358–67.
6. Wagner C, Zegers M, de Bruijne M. Onbedoelde en potentieel vermijdbare schade bij snijdende specialismen. [Unintended and potential preventable damage in surgical specialties]. Ned Tijdschr Geneeskd. 2009;153:B62.
7. Ruitenburg MM, Frings-dresen MHW, Sluiter JK. The prevalence of common mental disorders among hospital physicians and their association with self-reported work ability : a cross-sectional study. BMC Health Serv Res [Internet]. 2012;12(1):1. Available from: BMC Health Services Research
8. Frank JR, Snell L, Sherbino J. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.
9. Rice H, Warland J. Bearing witness: Midwives experiences of witnessing traumatic birth. Midwifery. 2013;29(9):1056–63.
10. Gold KJ, Kuznia AL, Hayward RA. How Physicians Cope With Stillbirth or. 2008;112(1):29–34.
11. Nuzum D, Meaney S. The impact of stillbirth on consultant obstetrician gynaecologists : a qualitative study *. 2014;1020–8.
12. Cauldwell M, Chappell LC, Murtagh GED, Bewley S. Learning about maternal death and grief in the profession : a pilot qualitative study. 2015;94:1346–53.
13. Leinweber J, Mph Ã, Rowe HJ. The costs of ' being with the woman ': secondary traumatic stress in midwifery. Midwifery [Internet]. 2010;26(1):76–87. Available from: http://dx.doi.org/10.1016/j.midw.2008.04.003
14. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fourth edition). Washington, DC; 1994.
15. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.
16. Friedman, MJ, Resick, PA, Bryant, RA, & Brewin C. Considering PTSD for DSM-5. Depress Anxiety. 2011;28:750–769.
17. Vries, G.J. de, & Olff M. The Lifetime Prevalence of Traumatic Events and Posttraumatic Stress Disorder in the Netherlands. J Trauma Stress. 2009;22:259–67.
18. Olff M. De posttraumatische stressstoornis. Ned Tijdschr Geneeskd. 2013;157(26):A5818.

19. Wu AW. Medical error: the second victim. BMJ. 2000;320(March):726–7.

20. Scott SD, Hirschinger LE, Cox KR, Mccoig M, Brandt J, Hall LW. The natural history of recovery for the healthcare provider ‘“ second victim ”’ after adverse patient events. 2009;325–31.

21. Scott SD, Hirschinger LE, Cox KR, McCoig M, Hahn-Cover K, Epperly KM, Philips EC HL. Caring for our own: deploying a systemwide second victim rapid response team. Jt Comm J Qual Patient Saf. 2010;36(5):233–40.

22. Lander LI, Connor JA, Shah RK, Kentala E, Healy GB RD. Otolaryngologists’ responses to errors and adverse events. Laryngoscope. 2006;116(7):1114–20.

23. Seys D, Wu AW, Gerven E Van, Vleugels A, Panella M, Scott SD, et al. Evaluation & the Health Professions after Adverse Events : A Systematic Review. 2013;

24. Wolf ZR, Serembus JF, Smetzer J, Cohen H CM. Responses and concerns of healthcare providers to medication errors. Clin Nurse Spec. 2000;14(6):278–87.

25. Beck CT, Logiudice J, Gable RK. A Mixed-Methods Study of Secondary Traumatic Stress in Certified Nurse-Midwives : Shaken Belief in the Birth Process. 2015;

26. Sheen K, Spiby H, Slade P. International Journal of Nursing Studies Exposure to traumatic perinatal experiences and posttraumatic stress symptoms in midwives : Prevalence and association with burnout. Int J Nurs Stud [Internet]. 2015;52(2):578–87. Available from: http://dx.doi.org/10.1016/j.ijnurstu.2014.11.006

27. Beck CT, Gable RK. R ESEARCH A Mixed Methods Study of Secondary Nurses. 2012;747–60.

28. Boyle D, O’Connell D, Platt FW AR. Disclosing errors and adverse events in the intensive care unit. Crit Care Med. 34(5):1532–7.

29. Van Gerven E, Van der Elst T, Vandenbroeck S, Dierickx S, Euwema M, Sermeus W, et al. Increased Risk of Burnout for Physicians and Nurses Involved in a Patient Safety Incident. Med Care. 2016;(currently in press).

30. Article O. Physicians’ Needs in Coping With Emotional Stressors. 2011;18–20.

31. Brewin C, Rose S, Andrews B, Green J, P PT, McEvedy C, et al. Brief screening instrument for post-traumatic stress disorder. Br J Psychiatry. 2002;181:158–62.

32. Dekkers A, Olff M, Naring G. Identifying persons at risk for PTSD after trauma with TSQ in the Netherlands. Communit Ment Heal J. 2010;46(1):20–5.

33. Landis J, Koch G. Measurement of observer agreement for categorical data. Biometrics. 1977;33:159–74.

34. Joesten L, Cipparrone N, Okuno-jones S, Dubose ER. Assessing the Perceived Level of Institutional Support for the Second Victim After a Patient Safety Event. 2015;11(2):73–8.

35. Mira JJ, Lorenzo S, Carrillo I, Ferrús L, Pérez-Pérez P, Iglesias F, et al. Interventions in health organisations to reduce the impact of adverse events in second and third victims. BMC Heal Serv Res. 2015;15(1):341.

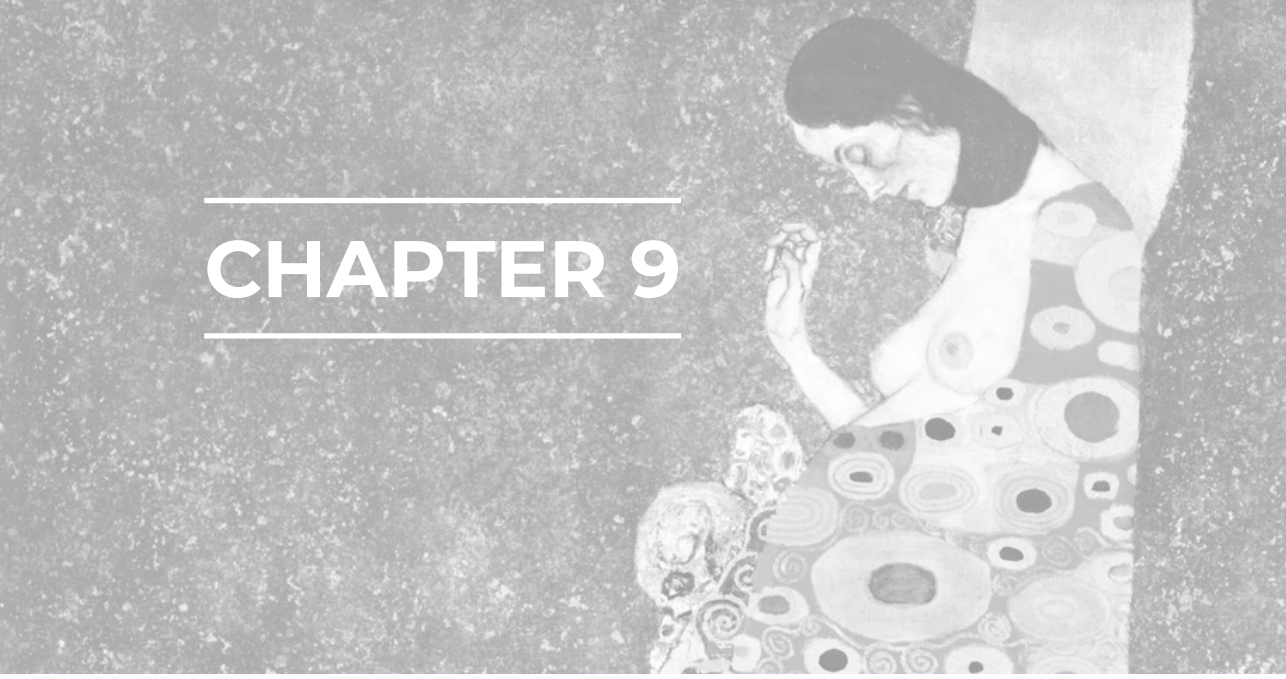
36. Ullström S, Andreen Sachs M, Hansson J, Ovretveit J, Brommels M. Suffering in silence: a qualitative study of second victims of adverse events. 2014;23(4):325–31.

37. Waterman A, Garbutt J, Hazel E, Dunagan W, Levinson W, Fraser V, et al. The emotional impact of medical errors on practicing physicians in the United States and Canada. Jt Comm J Qual Patient Saf. 2007;33(8):467–76.

38. van Gerven E, Deweer D, Scott S, Panella M, Euwema M, Sermeus W, et al. Personal, situational and organizational aspects that influence the impact of patient safety incidents: A qualitative study. Rev Calid Asist. 2016;[Epub ahead of print].

39. Schrøder K, Jørgensen JANS, Lamont RF, Hvidt NC. Blame and guilt – a mixed methods study of obstetricians ' and midwives ' experiences and existential considerations after involvement in traumatic childbirth. Acta Obstet Gynecol Scand. 2016;95(7):735–45.

40. Skogstad M, Skorstad M, Lie A, Conradi HS, Heir T, Weisæth L. Work-related post-traumatic stress disorder. 2013;175–82.



CHAPTER 9

Continuing the conversation: a cross-sectional study about the effects of work-related adverse events on the mental health of Dutch (resident) obstetrician-gynaecologists (ObGyns)

Baas MAM, Stramrood CAI, Molenaar JE, van Baar, PM, Vanhommerig JW, van Pampus MG. BMC Psychiatry. 2024. doi 10.1186/s12888-024-05678-3 *(in press)*

ABSTRACT

Background

Obstetrician-Gynaecologists (ObGyns) frequently face work-related adverse events such as severe obstetric complications and maternal or neonatal deaths. In 2014, the WATER-1 study showed that ObGyns are at risk of developing work-related posttraumatic stress disorder (PTSD), while many hospitals lacked a professional support system. The aim of the present study is to evaluate the current prevalence of work-related traumatic events and mental health problems among Dutch ObGyns, as well as to examine the current and desired support.

Methods

In 2022, an online questionnaire was sent to all members of the Dutch Society of Obstetrics and Gynaecology (NVOG), including resident and attending ObGyns. The survey included questions about experienced work-related events, current and desired coping strategies, and three validated screening questionnaires for anxiety, depression, and PTSD (HADS, TSQ, and PCL-5).

Results

The response rate was 18.8% and 343 questionnaires were included in the analysis. Of the respondents, 93.9% had experienced at least one work-related adverse event, 20.1% had faced a complaint from the national disciplinary board, and 49.4% had considered leaving the profession at any moment in their career. The prevalence rates of clinically relevant anxiety, depression, and psychological distress were 14.3, 4.4, and 15.7%, respectively. The prevalence of work-related PTSD was 0.9% according to DSM-IV and 1.2% according to DSM-5. More than half of the respondents (61.3%) reported the presence of a structured support protocol or approach in their department or hospital, and almost all respondents (92.6%) rated it as sufficient.

Conclusions

The percentages of anxiety, depression, psychological distress and PTSD were higher among ObGyns than the general population, but comparable to the similar performed study in 2014. Most Dutch ObGyns experience adverse events at work, which can be perceived as traumatic and, in certain cases, may lead to the development of PTSD. Structured support after adverse work-related events is now available in almost two-thirds of workplaces, and was mostly experienced as good. Despite substantial improvements in the availability and satisfaction of professional support after work-related adverse events, the prevalence rates of mental problems remain considerable, and it is imperative to sustain conversation about the mental well-being of ObGyns.

BACKGROUND

There is a growing body of evidence acknowledging physicians as a group with a high risk of work-related adverse events and posttraumatic stress disorder (PTSD), which has gained momentum as a result of the COVID-19 epidemic [1–3]. Physicians are frequently exposed to patients with severe illnesses, life-threatening emergencies, or the actual death of a patient. Obstetricians and gynaecologists (hereafter: ObGyns) are particularly vulnerable to a range of potentially distressing acute scenarios, such as fetal distress during labor, intrapartum fetal death, shoulder dystocia, unplanned caesarean section, maternal postpartum haemorrhage (PPH), and maternal or neonatal death [4–7]. Consequently, ObGyns are at higher risk of developing mental health issues, such as anxiety, depression, and work-related PTSD, compared to the general population [8,9].

Several previous studies have reported that mental health issues are more common among physicians than the general population [10]. It is difficult to assess exact prevalence due to several factors: wide variation in diagnostic tests, use of self-reported measurements, and heterogeneity between populations. Nevertheless, crucial patterns cannot be overlooked. Studies examining anxiety disorders among physicians are scarce, but a Dutch study among several medical specialties showed a point prevalence of 13.6% versus a 12-month prevalence of 6.0% in the general population [9]. With regard to depressive disorders, international research has indicated up to a threefold higher depression rate [11] and double the suicide rate among physicians [12] in contrast to the general population. Among Dutch physicians, a observed point-prevalence of depression of 6.4% was observed compared to a 12-month prevalence of 6.1% in the general population [9].

Regarding PTSD, approximately 80.7% of the general Dutch population will experience at least one traumatic event during their lifetime, which is mostly not work-related, leading to a 7.4% development of PTSD at some point [13]. Despite the underrepresentation of physicians in PTSD research, a study among Dutch hospital physicians showed substantially higher rates of PTSD, with 20.8% experiencing traumatic events at the workplace, and 1.5% currently suffering from work-related PTSD [9]. A British study reported that two-thirds of ObGyns had been exposed to traumatic work-related events, with 17.9% reporting clinically significant PTSD symptoms [7]. In a Swedish study of 706 obstetricians, 70.9% experienced one or several severe events during their careers, after which 6.9% experienced symptoms indicative of PTSD [14]. Additionally, another study noted a more than two-fold prevalence of PTSD in physicians compared to the general population, with the highest PTSD prevalence found among ObGyns (18.0%) within the seven medical specialties studied [15].

In 2014, our research group conducted the WATER-1 study [8] to determine the prevalence of work-related traumatic events and PTSD among Dutch ObGyns, and to evaluate the adequacy of the support provided. Of the 683 respondents, 12.6% had experienced

at least one work-related traumatic event and 1.5% met the criteria for PTSD. Of all respondents, 12.0% reported having a support protocol or strategy in their department or hospital, 25.7% were unaware of whether there was a protocol, and 62.3% reported that there was no such support. The support services after adverse events were rated insufficient by 60.0% at that time. These findings highlighted the urgent need to implement organized support.

The mental health of healthcare providers after exposure to adverse events is crucial for their overall well-being [16]. Physicians' mental health may also affect patient safety by potentially leading to an increase in medical errors or defensive decision making [17–20]. Furthermore, healthcare providers suffering from psychological problems may show decreased productivity with burn-out or even career transitions [21–23], and incur collateral costs [24]. In 2015, the importance of healthcare professionals' mental health was included as a new competency in the Canadian Medical Education Directives for Specialists 2015 (CANMEDS), a widely adopted framework defining the required skills for physicians working in healthcare [25]. In the Netherlands, the findings of the WATER-1 study were presented at the Gynaecongres (Dutch national gynecologists' congress) in 2014, followed by focus groups to determine the optimal implementation of the study results. Consequently, the Dutch Society of Obstetrics and Gynaecology (NVOG) established the Committee for Collegial Support (CCO) in 2015, which provides support to ObGyns who have experienced adverse or traumatic events, and also offers assistance and support in case of formal complaints. In 2016, the Dutch Federation of Medical Specialists recommended the provision of professional support in all hospitals following medical incidents [26]. An abundance of scientific research shows that the provision of interventions aimed at reducing PTSD symptoms among healthcare providers, including offering professional support, is positively correlated with physician wellbeing [27–29]. Several years later, following the significant attention given to this topic and many local and national initiatives, we will continue to engage in ongoing developments around work-related adverse events and evaluate their effects.

Eight years after our initial study (WATER-1), the present study (WATER-2) aimed to determine the current prevalence of anxiety, depression, work-related traumatic events and PTSD among (resident) ObGyns. Coping strategies and (professional) support were also assessed. It was hypothesized that anxiety, depression and PTSD would be (still) higher than in the general population (2) adverse work-related events would (still) be potentially experienced as traumatic and may lead to PTSD. In addition, we hypothesized that (3) most ObGyns nowadays have professional peer support protocols at their workplace, which are experienced as sufficient.

METHODS SECTION

Design and participants

This study had a cross-sectional design. The participants were members of the NVOG, consisting mainly of resident and attending gynecologists in the Netherlands, but also of non-practicing and retired ObGyns. All 1825 registered members of the database were invited. Data were collected from the beginning of February to halfway through March 2022. An email containing the link to the questionnaire in the online survey system SurveyMonkey® was sent to all NVOG members. Personal data were not traceable or recorded from this email or the link to the webpage.

Measurements

The 79-item questionnaire was inspired by a questionnaire used in a previous study[8], and further improved by our experience of using this questionnaire among other medical specialties [9]. The changes consisted of adding or removing questions, rephrasing questions, and adding or changing answer options. The survey was piloted among members of the CCO, after which minor changes were made. The final questionnaire consisted of items on demographics (n=5), personal experiences with work-related events (n=10), impact of the COVID-19 pandemic (n=2), respondents' responses to work-related adverse events (n=1), and actual and desired support after work-related adverse events (n=7).

Furthermore, three validated self-report instruments were used in this study. The Hospital Anxiety and Depression Scale (HADS) was used to screen for anxiety and depression. This self-report questionnaire consists of two subscales: seven questions about the symptoms of depression (HADS-D) and seven questions about the symptoms of anxiety (HADS-A). These variables can be evaluated both separately (with a cutoff score of 8 or higher) and combined (with a cutoff score of 12 or higher) as a general measure of psychological distress[30,31]. Psychometric properties have been validated with Cronbach's alpha ranging from 0.67 to 0.90 (HADS-D) and from 0.68 to 0.93 (HADS-A) in different populations [30,32].

Two validated screening questionnaires were used to screen for PTSD symptoms. The Trauma Screening Questionnaire (TSQ) is a validated 10-item screening instrument for evaluating PTSD symptoms according to the DSM-IV [33]. Psychometric properties were validated with Cronbach's alphas ranging from 0.71 to 0.91 [34]. The cutoff value for provisional diagnosis of PTSD was 6 or higher.

The Posttraumatic Stress Disorder Checklist for DSM-R (PCL-5) is a validated 20-item self-report screener that assesses the 20 PTSD symptoms according to the DSM-5. A cutoff score of 33 or higher indicates probable PTSD. The psychometric properties are validated with a Cronbach's alpha of 0.94 [35,36].

In 2017, the new version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [37] was implemented in the Dutch healthcare setting. For PTSD, one of the most important differences between DSM-IV and DSM-5 was the removal of the A2-criterium regarding experiencing fear, helplessness, or horror during a traumatic event. In our previous study (WATER-1) in 2014, a screening instrument for PTSD was used that was based on the DSM-IV criteria (TSQ). To allow for (1) screening based on the most recent guidelines (i.e. DSM-5), we used the PCL-5 (2) an 'eyeball-comparison' between 2014 and 2022, we also used the TSQ in the current study.

In our study, respondents were asked whether they had experienced one or more traumatic events at work (one or more) at least four weeks ago. Those with an affirmative response (i.e., meeting DSM-5 criterion A) completed the PTSD Checklist for DSM-5 (PCL-5). Respondents who also reported experiencing fear, helplessness, or horror during the event (i.e., meeting DSM-IV criterion A2) completed the Trauma Screening Questionnaire (TSQ) in addition to the PCL-5.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics for Windows version 27. The multiple-choice questions and the 4-point Likert scale questions were analyzed using descriptive statistics. Chi-square tests and Fisher's exact tests were used to compare subgroups for the categorical variables. All variables are presented as numbers and percentages. Multivariable logistic regression was used to assess the effects of function (attending vs. resident), sex (male vs. female), years of experience, and age on respondents' mental health issues. Statistical significance was set at p-value of less than 0.05. A direct statistical comparison with the WATER-1 study [8] was not feasible because of two reasons. First, there were extensive changes in many questions of the questionnaire, including adding or removing questions, rephrasing questions, and adding or changing the answer options. Second, the respondent populations of 2014 and 2022 were partly overlapping, resulting in data being dependent rather than independent samples. Due to the anonymous questionnaire, this percentage of respondents was unknown.

RESULTS

A total of 343/1825 (18.8%) members of the NVOG completed the questionnaire. Respondents who started but did not complete the questionnaire (n=35) were excluded from the final analysis. One respondent was a physician assistant and not a ObGyn, and was therefore not included in the analysis. The characteristics of the current respondents (n=343) were comparable to those of the reference NVOG population (n=1825), except for an underrepresentation of retired ObGyns in our sample compared to the membership database (Table 1 and 2). Of all non-practicing ObGyns (n=5), one respondent left the profession due to a work-related adverse event.

Table 1 Demographic characteristics of respondents and NVOG population

Variable	Respondents (n=343)		NVOG population (membership database) (n=1.825)	
	n	(%)	n	(%)
ObGyns				
Resident	84	(24.5)	419	(23.0)
Attending	229	(66.8)	1119	(61.3)
Non-practicing	5	(1.5)	-	-
Retired	25	(7.3)	287	(15.7)
Sex				
Male	90	(26.2)	614	(33.6)
Female	253	(73.8)	1211	(66.4)
Age				
25-34	61	(17.8)	-	-
35-44	117	(34.1)	-	-
45-54	79	(23.0)	-	-
55-64	53	(15.5)	-	-
≥ 65	33	(9.6)	-	-
Years in practice				
0-5	38	(11.1)	-	-
6-10	63	(18.4)	-	-
11-15	65	(19.0)	-	-
16-20	50	(14.6)	-	-
> 20	127	(37.0)	-	-

All variables are in number (%).
NVOG Dutch Society of Obstetrics & Gynaecology
-: Unknown data.

Table 2 Demographic variables per subgroup of the respondents

	Total (n=343)		Resident (n=84)		Attending (n=229)		Non-practicing (n=5)		Retired (n=25)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Sex										
Male	90	(26.2)	12	(14.3)	55	(24.0)	2	(40.0)	21	(84.0)
Female	254	(73.8)	72	(85.7)	174	(77.0)	3	(60.0)	4	(16.7)
Age										
25-34	61	(17.7)	58	(69.0)	3	(1.3)	0	(0.0)	0	(0.0)
35-44	117	(34)	25	(29.8)	92	(40.7)	0	(0.0)	0	(0.0)
45-54	80	(23.3)	1	(1.2)	78	(34.1)	1	(20.0)	0	(0.0)
55-64	53	(15.4)	0	(0.0)	52	(22.7)	2	(40.0)	0	(0.0)
≥ 65	33	(9.6)	0	(0.0)	4	(1.8)	2	(40.0)	25	(100)

Table 2 Demographic variables per subgroup of the respondents *(continued)*

	Total (n=343)		Resident (n=84)		Attending (n=229)		Non-practicing (n=5)		Retired (n=25)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Years in practice										
0-5	38	(11.0)	37	(44.0)	1	(0.4)	0	(0.0)	0	(0.0)
6-10	63	(18.3)	39	(46.4)	24	(10.6)	0	(0.0)	0	(0.0)
11-15	65	(18.9)	8	(9.5)	56	(24.8)	1	(20.0)	0	(0.0)
16-20	50	(14.5)	0	(0.0)	48	(21.2)	1	(20.0)	1	(4.2)
> 20	128	(37.2)	0	(0.0)	100	(43.7)	3	(60.0)	24	(96.0)
Work-related adverse event	320	(93.0)	78	(92.9)	209	(92.5)	5	(100.0)	24	(100.0)
Complaint at disciplinary board	69	(20.1)	1	(1.2)	50	(22.1)	1	(20.0)	15	(62.5)

All variables are in number (%).

Anxiety, depression, and psychological distress

Of all responding ObGyns, 49 (14.3%) scored above the cutoff value for anxiety (Table 3).

Table 3 The measurements of mental health of Dutch resident and attending ObGyns in 2022

	Total (n=343)		Resident (n=84)		Attending (n=229)	
	n	(%)	n	(%)	n	(%)
Clinically relevant anxiety[a]	49	(14.3)	17	(20.2)	26	(11.4)
Clinically relevant depression[b]	15	(4.4)	3	(3.6)	11	(4.8)
Psychological distress[c]	54	(15.7)	16	(19)	34	(14.8)
Using DSM-IV:						
PTSD criterion A	45	(13.1)	10	(11.9)	30	(13.1)
Probable PTSD[d]	3	(0.9)	0	(0)	2	(0.9)
Using DSM-5:						
PTSD criterion A	127	(37.0)	47	(56.0)	111	(48.5)
Probable PTSD[e]	4	(1.2)	0	(0)	2	(0.9)

All variables are in number (%)
[A] Measured with HADS-A cutoff ≥ 8
[B] Measured with HADS-D cutoff ≥ 8
[C] Measured with HADS cutoff ≥ 12
[D] Measured with TSQ cutoff ≥ 6
[E] Measured with PCL-5 cutoff ≥ 33
Not included in this table: non-practicing and retired ObGyns

Resident ObGyns were more likely to have anxiety scores above the cut-off than attending ObGyns (aOR 0.68; 95% CI 0.46 to 0.99, p=0.042, also corrected for sex). Those with up to five years of work experience were more likely to report clinically relevant anxiety than those with over 20 years in practice (aOR 0.51, 95% CI 0.30 to 0.85, p=0.011).

The prevalence of depression was 4.4%, and no significant differences were found across sex, age and function by multivariable logistic regression analyses.

Of the responding ObGyns, 54 (15.7%) scored above the cut-off for increased psychological distress. Females were at a significantly higher risk of scoring above the cut-off value for psychological stress than males (aOR 1.70, 95% CI 1.16 to 2.48, p=0.006).

The influence of the COVID-19 pandemic

Among all respondents, 53 (15.4%) ObGyns reported that the COVID-19 pandemic situation had influenced their ability to cope with work-related traumatic events. Furthermore, 23 (6.7%) respondents reported increased difficulty in accessing help or support during the COVID-19 pandemic.

Leaving the profession

Half of the responding ObGyns (n=170; 49.4%) had considered leaving their profession at some point during their careers, of which 30 (17.6%) respondents mention that they regularly contemplate quitting. The most frequently mentioned reasons for considering leaving the profession were a work-life imbalance, high workload, high responsibility, demanding work culture, and interpersonal conflicts with colleagues. Notably, 15 (8.8%) of the ObGyns that had considered leaving their profession reported considering quitting due to a work-related adverse event.

Work-related adverse events

Almost all respondents (n=320; 93%) reported experiencing a work-related adverse event during their careers, which did not differ between resident or attending ObGyns (Table 2). The most commonly reported adverse events were death of the patient or neonate (93.9%), the knowledge that the patient or neonate will be left with lasting damage (85.5%), missing a diagnosis (69.5%) and misjudging a situation (68.3%) (Figure 1). Attending ObGyns had a higher percentage of formal complaints (22.1%) compared to resident ObGyns (1.2%), with an average of 20.1% (Table 2). Of the ObGyns who faced a complaint at the disciplinary board (n=69), 45 (65.2%) agreed that the disciplinary complaint had (unspecified) effects on their performance in the workplace.

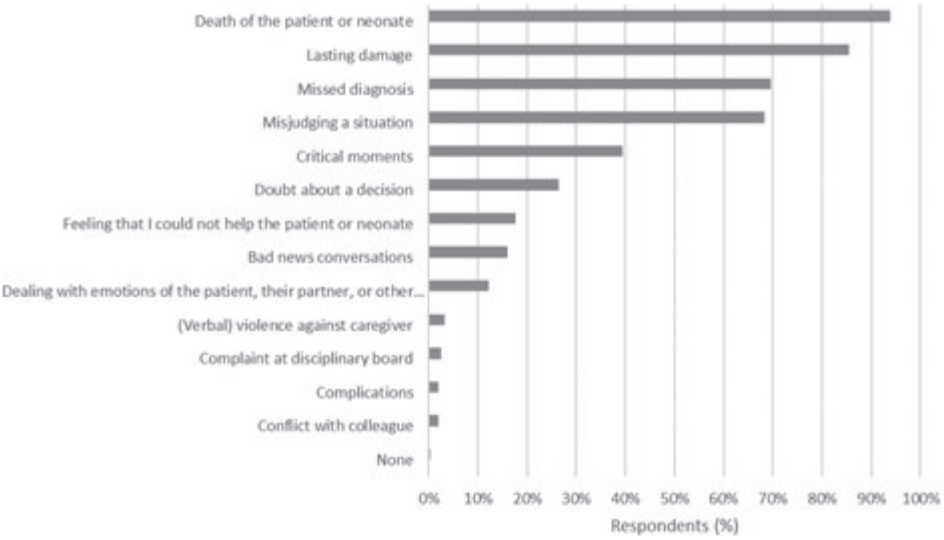


Figure 1. Events with high emotional impact (multiple answers possible)

Posttraumatic stress disorder

Table 3 presents the outcomes of the TSQ and PCL-5 questionnaires. A higher percentage of ObGyns met the A-criterium for PTSD according to the DSM-5 criteria compared to DSM-IV (37.0% versus 13.1%), with 1.2% versus 0.9% meeting the criteria for PTSD.

Coping

The results regarding the coping strategies ObGyns use after a work-related adverse event are shown in Figure 2.

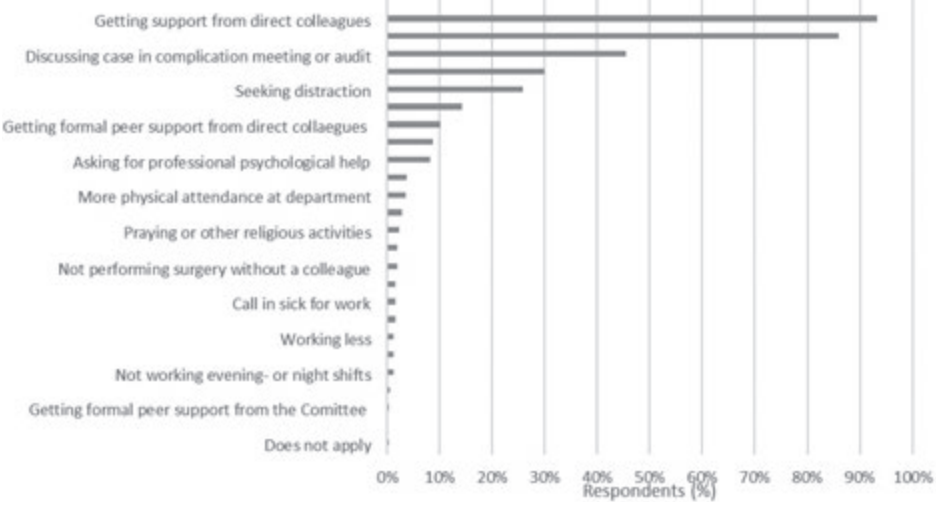


Figure 2. Coping strategies after a work-related adverse event (multiple answers possible)

The most commonly used strategies were seeking informal support from direct colleagues (93.3%), talking with their partner, friends, or family (86.0%), discussing the case in a complication meeting or audit (45.5%), participating in sports or other hobbies (30.0%), and finding distraction in another way (25.9%).

Formal support

More than half of the respondents (61.3%) reported the presence of a structured support protocol or approach at their workplace, 26.% did not know, and 10.5% reported there was no such protocol/approach. When a structured protocol/approach was present, this mostly consisted of professional peer support (43.6%), support from direct colleagues (37.8%), support from other colleagues in the department (29.9%), debriefing with involved caregivers (8.7%), team debriefing (6.4%), and guidance from a specialized care team (4.9%). Most respondents (92.6%) indicated that the currently offered support at the department was sufficient. The desired support was described as talking to a direct colleague (ObGyns) (29.8%), other colleagues in the department such as a nurse of midwife (21.1%), indirect colleagues from another hospital department (12.7%), and one-on-one meeting with a psychologist or coach (10.8%).

DISCUSSION

The results of this study show that ObGyns are not immune to mental health disorders, with prevalence rates of anxiety, depression and PTSD higher than what would be expected for a highly-educated high-income group compared to the general population [38]. Additionally, the results support the hypothesis that adverse work-related events are (still) potentially traumatic and may lead to PTSD. Furthermore, the finding that the majority of ObGyns nowadays have access to professional peer support at their work place, and find it to be sufficient, aligns with our final hypothesis.

The **point** prevalence rates of anxiety and depression in the current study were 14.3% and 4.4%, respectively. These numbers are comparable to those of the WATER-1 study (15.8% and 6.5%), but compared to the **12-month** prevalences in the general Dutch population with a high educational degree (13.9% and 6.1%, respectively)[38], anxiety in particular appears to be higher. A higher prevalence among Dutch ObGyns compared to the general population is comparable with many previous literature that reported increased rates of anxiety and depression in medical students, resident doctors, and medical specialists compared to the general population [11,39,40]. Given the high prevalence of depression among physicians, and its association with a threefold increase in harmful medical errors [20,41], this finding is of significant importance. In addition, in our study, females ObGyns were more likely to score above the cut-off value for psychological stress than their male colleagues. With the strong increase in female medical specialists the last decades, the field may need to evolve to ensure sustainable employability of their physicians.

In the period between the WATER-1 study and the current (WATER-2) study, the psychological consequences of adverse (or traumatic) work-related events for healthcare providers has emerged as an important topic in scientific research. The topic has gained interest worldwide, in specific the COVID-19 pandemic has heightened the need to understand the consequences of work-related traumatic events among healthcare providers. Although many healthcare workers might have experienced increased stress levels because of the COVID-19 pandemic [42], in the current study, a minority of 15.4% of all ObGyns stated that the situation around the COVID-19 pandemic influenced coping with work-related adverse events.

The current study revealed that the vast majority of respondents (93%) reported experiencing at least one work-related adverse event during their career, with 13.1% - 37.0% of these events classified as traumatic according to DSM-IV and DSM-5 criteria, respectively. The significant contrast in the application of DSM-IV versus DSM-5 is apparent, with nearly one-third of the traumatic events experienced by ObGyns meeting the criteria under DSM-5 but not being adequately recognized as traumatic using DSM-IV A criteria. Notably, the prevalence of traumatic events of 13.1% (WATER-2) when using the DSM-IV seems comparable to the 12.6% in the WATER-1 study [8].

In the current study, the prevalence rate of current PTSD was found to be 0.9% – 1.2%, according to DSM-IV and DSM-5, respectively. The WATER-1 study reported a prevalence of PTSD of 1.3% according to DSM-IV, suggesting a comparable prevalence in recent times. These findings may indicate that respondents benefitted from enhanced professional support after adverse events and increased awareness in this area. However, given the limited numbers (with a maximum of 10 ObGyns with PTSD in the WATER-1 study) and the impossibility to make direct or longitudinal statistical comparisons, it is essential to interpret these results with caution. Although professional support after traumatic events is essential, it is also crucial to recognize the complexity surrounding PTSD. The development of PTSD depends on a range of elements such as genetic predispositions, personal coping mechanisms, pre-existing mental health conditions like depression or prior trauma and many others that collectively contribute to the susceptibility of developing PTSD. Lastly, the precise impact of the COVID-19 pandemic on our data remains uncertain. Although global evidence indicates a significant increase in PTSD prevalence among physicians as a result of the pandemic [42,43], our study lacks the means to ascertain this influence.

In the present study, it was found that 61.3% of ObGyns reported having a structured protocol or approach for support at their workplace after being involved in an adverse work-related event, whereas only 12.0% of the ObGyns had such resources in the earlier WATER-1 study. The absence of any formal protocol or approach is reported by 10.5% of the respondents in the current study (WATER-2), which is substantially lower than the 62.3% reported in the earlier study (WATER-1). Additionally, 7.3% of respondents

(WATER-2) found inadequate support (when available), which seems to be a considerable improvement from the 60.0% reported in the WATER-1 study. Collectively, these findings suggest a substantial enhancement in the accessibility and experienced quality of professional support following adverse events in the workplace.

The personal coping strategies employed by ObGyns appeared consistent with those identified in the WATER-1 study, predominantly involving seeking support from colleagues, partner, family, or friends. Interestingly, the current study indicated a higher proportion of respondents considering leaving the profession (49.4% in WATER-2 compared 33.7% in WATER-1). The most frequently cited reasons for this contemplating quitting included work-life imbalance and an excessive workload, with work-related adverse events accounting for this in a minority of cases (8.8%).

A notable strength of this study is its reevaluation of the consequences arising from adverse work-related events among Dutch ObGyns, employing a study design comparable to the WATER-1 study [8]. However, an important limitation is that a repeated measures study design with direct statistical comparisons was not feasible. This limitation stems from the partial overlap of respondents between 2014 and 2022, as the composition of the NVOG database changes over time. New members are added, resident ObGyns transition to attending ObGyns, attending ObGyns become non-practicing or retire, and some members unsubscribe). The database initially contained 1596 members in 2014, which increased to 1.825 in 2022. Additionally, the study encountered a lower response rate than in 2014 (18.2% versus 42.8%, respectively), though such response rates are common in survey studies. Another limitation of the study is the potential for selection bias which cannot be ruled out, as well as the unavailability of non-responder analysis due to the anonymous participation. Consequently, it was not possible to determine whether the prevalence rates of PTSD observed in our study were an underrepresentation or overrepresentation of the actual rates. Finally, it should be noted that only self-report questionnaires are used to estimate prevalences of anxiety, depression, and PTSD, whereas a clinical interview is required for a formal diagnosis.

In future research, a longitudinal design would be highly valuable, tracking resident ObGyns throughout their carriers to assess their mental well-being and their encounters with adverse work-related events. This approach enables comprehensive evaluation of psychological condition, including burnout symptoms and workload experiences. One of the issues that emerged from the findings of the current study is what optimal support after work-related adverse events is. Despite a notable increase in satisfaction and availability of professional support in the workplace, a considerable number of ObGyns still reported a lack of sufficient support. Furthermore, even when professional support is accessible, it is crucial to acknowledge that healthcare providers may still encounter stigmas and barriers that hinder their access to adequate support [44].

Despite the current data suggesting substantial improvements in the availability and satisfaction of the professional support after work-related adverse events, the prevalence rates of anxiety, depression and PTSD remain considerable. Furthermore, the number of ObGyns contemplating leaving their profession continue to rise. Therefore, it is imperative to sustain a conversation about the mental well-being of ObGyns and maintain awareness of this critical issue in order to support their emotional health, improve retention within the profession, and ensure the quality of care for patients.

Acknowledgements

We would like to thank the NVOG for their contribution in collecting the data provided and we would like to thank all members of the NVOG for their cooperation.

REFERENCES

1. Allan SM, Bealey R, Birch J, Cushing T, Parke S, Sergi G, et al. The prevalence of common and stress-related mental health disorders in healthcare workers based in pandemic-affected hospitals: a rapid systematic review and meta-analysis. EJPT. 2020;11:1810903.
2. D'Ettore G, Pellicani V, Ceccarelli G. Post-traumatic stress disorder symptoms in healthcare workers: a ten-year systematic review. Acta Biom. 2020;91(12):e2020009.
3. Sanghera J, Pattani N, Hashmi Y, Varley KF, Cheruvu M., Bradley A, et al. The impact of SARS-CoV-2 on the mental health of healthcare workers in a hospital setting-A Systematic Review. J Occup Heal. 2020;62(1):e12175.
4. McNamara K, Meany S, O'Donoghue K. Intrapartum fetal death and doctors: a qualitative exploration. Acta Obstet Gynecol Scand. 2018;97(7):890–8.
5. Nuzum D, Meany S, O'Donoghue K. The impact of stillbirth on consultant obstetrician gynaecologists: a qualitative study. BJOG. 2014;121(8):1020–8.
6. Sheen K, Goodfellow L, Balling K, Rymer J, Weeks A, Spiby H, et al. Which events are experienced as traumatic by obstetricians and gynaecologists, and why? A qualitative analysis from a cross-sectional survey and in-depth interviews. BMJ Open. 2022;21(11):e061505.
7. Slade P, Sheen KB, Goodfellow L, Rymer J, Spiby H, Weeks A. Work-related post-traumatic stress symptoms in obstetricians and gynaecologists: findings from INDIGO, a mixed-methods study with a cross-sectional survey and in-depth interviews. BJOG. 2020;127(5):600–8.
8. Baas MAM, Scheepstra KWF, Stramrood CAI, Evers R, Dijksman LM, van Pampus MG. Work-related adverse events leaving their mark: A cross-sectional study among Dutch gynecologists. BMC Psychiatry. 2018;18(1).
9. Scheepstra KWF, Pauw HS, Van Steijn ME, Stramrood CAI, Olff M, Van Pampus MG. Potential traumatic events in the workplace and depression, anxiety and post-traumatic stress: A cross-sectional study among Dutch gynaecologists, paediatricians and orthopaedic surgeons. BMJ Open. 2020;10(9):1–8.
10. Harvey S, Epstein R, Glozier N, Petrie K, Strudwick J, Gayed A, et al. Mental illness and suicide among physicians. Lancet. 2021;398(January):920–30.
11. Mata DA, Ramos MA, Bansal N, Khan R, Guille C, Di Angelantonio E, et al. Prevalence of Depression and Depressive Symptoms Among Resident Physicians: A Systematic Review and Meta-analysis. JAMA. 2015;314(22):2373–83.
12. Dutheil F, Aubert C, Pereira B, Dambrun M, Moustafa F, Mermillod M, et al. Suicide among physicians and health-care workers: A systematic review and meta-analysis. PLoS One. 2019;14(12):1–28.
13. Vries, G.J. de, & Olff M. The Lifetime Prevalence of Traumatic Events and Posttraumatic Stress Disorder in the Netherlands. J Trauma Stress. 2009;22:259–67.
14. Wahlberg A, Andreen Sachs M, Johannesson K, Hallberg G, Jonsson M, Skoog Svanberg A, et al. Post-traumatic stress symptoms in Swedish obstetricians and midwives after severe obstetric events: a cross-sectional retrospective survey. BJOG. 2016;124(8):1264–71.
15. Jackson T, Jackson D, Nelson P, Kim D, Agrawal V, Truitt M. Traumatized attendings - When the doctor has the disease. Am J Surg. 2022;223(4):626–32.

16. Hamama-Raz Y, Walker R, Palgi Y, Mashiach R, Lee-Ovadia K, Manny A, et al. Comorbidity of post-traumatic stress symptoms and depressive symptoms among obstetric nurses with perinatal death exposure. Isr J Psychiatry. 2016;53(2):58–63.

17. Beck CT, Logiudice J, Gable RK. A Mixed-Methods Study of Secondary Traumatic Stress in Certified Nurse-Midwives : Shaken Belief in the Birth Process. 2015;

18. Minooee S, Cummins A, Sims DJ, Foureur M, Travaglia J. Scoping review of the impact of birth trauma on clinical decisions of midwives. J Eval Clin Pr. 2020;26(4):1270–9.

19. Panella M, Rinaldi D, Leigheb F, Donnarumma C, Kul S, Vanhaecht K, et al. The determinants of defensive medicine in Italian hospitals: The impact of being a second victim. Rev Calid Asist. 2016;31(suppl 2):20–5.

20. Pereira-Lima K, Mata DA, Loureiro SR, Crippa JA, Bolsoni LM, Sen S. Association between Physician Depressive Symptoms and Medical Errors: A Systematic Review and Meta-analysis. JAMA Netw Open. 2019;2(11):1–14.

21. Dewa CS, Loong D, Bonato S, Thanh NX, Jacobs P. How does burnout affect physician productivity? A systematic literature review. BMC Heal Serv Res. 2014;14:325.

22. Ravaldi C, Carelli E, Frontini A, Mosconi L, Tagliavini S, Cossu E, et al. The BLOSSoM study: Burnout after perinatal LOSS in Midwifery. Results of a nation-wide investigation in Italy. Women and Birth. 2022;35(1):48–58.

23. Van Gerven E, Bruyneel L, Panella M, Euwema M, Sermeus W, Vanhaecht K. Psychological impact and recovery after involvement in a patient safety incident: A repeated measures analysis. BMJ Open. 2016;6(8).

24. Dewa CS, Jacobs P, Thanh NX. An estimate of the cost of burnout on early retirement and reduction in clinical hours of practicing physicians in Canada. BMC Heal Serv Res. 2014;14:254.

25. Frank JR, Snell L, Sherbino J. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.

26. Federatie Medisch Specialisten (FMS). Medische incidenten hebben grote impact op betrokken specialisten [Internet]. 31-10-2016. 2016. Available from: https://demedischspecialist.nl/nieuwsoverzicht/nieuws/medische-incidenten-hebben-grote-impact-op-betrokken-specialisten

27. Nydoo P, Pillay BJ, Naicker T, Moodley J. The second victim phenomenon in health care: A literature review. Scand J Public Heal. 2020;48(6):629–37.

28. Qian J, Wang W, Sun S, Liu L, Sun Y, Yu X. Interventions to reduce post-traumatic stress disorder symptoms in health care professionals from 2011 to 2021: A scoping review. BMJ Open. 2022;12(1):1–8.

29. Sprang G, Lei F, Bush H. Can organizational efforts lead to less secondary traumatic stress? A longitudinal investigation of change. Am J Orthopsychiatry. 2021;91(4):443–53.

30. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. J psychom res. 2002;52(2):69–77.

31. Spinhoven P, Ormel J, Sloekers P, Kempen G, Speckens A, Van Hemert A. A validation study of the Hospital anxiety and depression scale (HADS) in different groups of Dutch subjects. Psychol Med. 1997;27:363–370.

32. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361–70.

33. Brewin C, Rose S, Andrews B, Green J, P PT, McEvedy C, et al. Brief screening instrument for post-traumatic stress disorder. Br J Psychiatry. 2002;181:158–62.

34. Dekkers A, Olff M, Naring G. Identifying persons at risk for PTSD after trauma with TSQ in the Netherlands. Communit Ment Heal J. 2010;46(1):20–5.

35. Boeschoten MA, Bakker A, Jongedijk RA, Olff M. PTSD Checklist for DSM-5– Dutch Version. Arq Psychotrauma Expert Groep, editor. Diemen; 2014.

36. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD at www.ptsd.va.gov; 2013.

37. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.

38. ten Have M, Tuithof M, van Dorsselaer S, Schouten F, de Graaf R. NEMESIS Kerncijfers psychische aandoeningen Vóórkomen van psychische aandoeningen [Internet]. 2021. Available from: https://cijfers.trimbos.nl/nemesis/kerncijfers-psychische-aandoeningen/voorkomen-psychische-aandoeningen

39. Borst JM, Frings-Dresen MH, Sluiter JK. Prevalence and incidence of mental health problems among Dutch medical students and the study-related and personal risk factors: a longitudinal study. Int J Adolesc Med Hdalth. 2016;28(4):349–55.

40. Hope V, Henderson M. Medical student depression, anxiety and distress outside North America: a systematic review. Med Educ. 2014;48(10):963–79.

41. Brunsberg K, Landrigan C, Garcia B, Petty C, Sectish T, Simpkin A, et al. Association of Pediatric Resident Physician Depression and Burnout With Harmful Medical Errors on Inpatient Services. Acad Med. 2019;94(8):1150–6.

42. de Vroege L, van den Broek A. Substantial Impact of COVID-19 on Self-Reported Mental Health of Healthcare Professionals in the Netherlands. Front Public Heal. 2022;10(9):796591.

43. Kiefer MK, Mehl RR, Venkatesh KK, Costantine MM, Rood KM. High frequency of posttraumatic stress symptoms among US obstetrical and gynecologic providers during the coronavirus disease 2019 pandemic. AJOG. 2021;224(4):410–3.

44. Edrees HH, Wu AW. Does One Size Fit All? Assessing the Need for Organizational Second Victim Support Programs. J Patient Saf. 2021;17(3):e247–54.

CHAPTER 10

Summary and general discussion

“Fear and PTSD in obstetrics: Improving care for pregnant women and their healthcare providers”

10.1 INTRODUCTION

The current chapter provides an overview of the conclusions drawn from each individual study, followed by a general discussion.

The purpose of this thesis was to increase evidence based knowledge about fear and psychological trauma in obstetrics. The main aims of this thesis are as follows:

- to develop more insight into Fear of Childbirth (FoC) and childbirth-related posttraumatic stress disorder (PTSD) among pregnant women.
- to determine the efficacy and safety of trauma-focused therapy, specifically EMDR therapy, in pregnant women with FoC or childbirth-related PTSD.
- to determine the impact of adverse and traumatic work-related events on Dutch gynaecologists, as well as their coping mechanisms and support.

To this end, we conducted a series of studies with different designs to determine the natural course of FoC (HEAR-study), evaluate the experience of therapists with EMDR therapy during pregnancy (VIP-study), determine the safety and efficacy of EMDR therapy for women with FoC or PTSD (OptiMUM-study), and analyze the impact of adverse work-related events among Dutch gynaecologists (WATER 1 and WATER 2-studies).

10.2 SUMMARY

PART 1: IDENTIFICATION

Chapter 2

The HEAR-study aimed to investigate the prevalence and course of FoC during pregnancy and to explore its influence on the preferred mode of delivery and self-reported need for help. A cross-sectional and longitudinal analysis was conducted among nulliparous pregnant women using an online survey, including the Wijma Delivery Expectancy Questionnaire version A (WDEQ-A), to assess FoC continuously and dichotomously. A total of 364 women were enrolled in the study, of which 118 participated in the longitudinal analysis. In the cross-sectional analysis, the prevalence of FoC was 18.4%, with no significant differences among the trimesters. However, in the longitudinal sample, this prevalence decreased to 11.0% over time and the overall mean sum scores of FoC decreased. An increase in the FoC sum score occurred in one out of three women in the longitudinal cohort but without new-onset FoC. Women with FoC were more likely to prefer a planned caesarean section and pain relief during childbirth. Furthermore, they were more likely to actively seek help for their FoC. This study also highlights the preferred timing and sources of help, with midwives being the primary preference for seeking help. These findings emphasize the need for early identification of and support

for women experiencing FoC during pregnancy to improve their psychological well-being and childbirth experience.

Chapter 3

The VIP-study investigated therapists' perspectives on treating PTSD during pregnancy. This cross-sectional study, encompassing 301 Dutch therapists, revealed that 48.8% of therapists had heard of potential harm following PTSD treatment during pregnancy, mostly due to the expectation of negative fetomaternal effects. Although 30.5% of therapists were reluctant to treat PTSD in pregnant women, 81.7% had experience with it. Among these, EMDR therapy was the preferred treatment for both the general and pregnant populations. Most therapists observed a decrease in symptoms of PTSD, and only a small percentage reported perceived adverse events, such as heightened PTSD symptoms and general distress; however, due to the study design and self-report questionnaires, the results should be handled with caution.

Chapter 4

The systematic review and case study presented in Chapter 4 addressed the safety and efficacy of various interventions for the treatment of PTSD (symptoms) in pregnant women. Thirteen studies encompassing eight types of interventions were included. No adverse events were reported. PTSD symptoms improved significantly in four studies. However, the study designs, small numbers, and a high risk of bias compromised definitive conclusions. In the case study, a pregnant woman with PTSD after a previous pregnancy in which intrauterine fetal death occurred received three sessions of EMDR therapy. At 36 weeks of gestational age, FoC and PTSD were in complete remission, which continued in the postpartum follow-up. No adverse events were reported. Despite these promising results, further research is necessary to better understand the safety and efficacy of PTSD treatments during pregnancy.

PART 2: TREATMENT

Chapter 5

Chapter 5 presents the OptiMUM-study protocol. The aim of this study was to assess the safety and effectiveness of EMDR therapy in pregnant women with PTSD after previous childbirth or FoC. This single-blinded study involved two separate two-armed randomized controlled trials (RCT's) that included pregnant women between 8 and 20 weeks of gestational age. The WDEQ-A was used to assess FoC. In multiparous women, when scores on the PTSD Checklist for DSM-5 (PCL-5) were above the cutoff value, the Clinician Administered PTSD Scale (CAPS-5) was used to diagnose PTSD according to the DSM-5. Women with PTSD after previous childbirth (N=50) or FoC (N=140) were randomly assigned to either three sessions of EMDR therapy or care-as-usual (CAU). While the primary outcome measurement was symptom severity, various other results have also been reported, including psychological, obstetrical, and neonatal outcomes.

Chapter 6

Chapter 6 presents the primary outcome of the OptiMUM-study. The trial included 141 women with FoC, of which 70 were allocated to the EMDR therapy group and 71 to the CAU group. No differences in adverse (psychological) effects were found. The results indicated that pregnant women in both the EMDR therapy group and the CAU group experienced a significant reduction in FoC symptoms, with a mean decrease of 25.6 and 17.4 point in the WDEQ-A sum score, respectively. Although the EMDR therapy group demonstrated a large effect size (Cohen's d = 1.36), no significant differences were found between the two groups regarding the decrease in FoC symptoms. Although EMDR therapy has been found to be safe and effective in reducing FoC symptoms in some previous studies, this study did not support the beneficial effects of EMDR therapy compared to CAU for this target group.

Chapter 7

Chapter 7 presents the obstetric outcomes of the OptiMUM study. The sample comprised 141 pregnant women with FoC. The outcomes included maternal, obstetrical, and neonatal outcomes; patient satisfaction with pregnancy and childbirth; and childbirth experiences. Although a high overall percentage of caesarean sections (37.2%) was found, this rate did not differ significantly between the groups. Interestingly, women who received EMDR therapy were seven times less likely to request induction of labor (i.e., without medical indication) than those in the CAU group. No significant differences in other obstetric or neonatal outcomes, satisfaction, or childbirth experience were found between the two groups. The findings of this study suggest that EMDR therapy administered during pregnancy does not have any adverse effects on pregnancy, childbirth, or neonatal outcomes.

PART 3: HEALTHCARE PROVIDERS

Chapter 8

Chapter 8 describes the results of the cross-sectional WATER-1 study, which evaluated exposure to work-related adverse and potential traumatic events, coping strategies, and professional support among 683 Dutch obstetrician-gynaecologists (ObGyns; response rate 42.8%) in 2014. This study found a 1.5 % prevalence of *current work-related* PTSD according to the DSM-IV, which appears to be higher than the prevalence of (work-related and non-work-related) PTSD in the general Dutch population. Common coping strategies included seeking support from colleagues, family, or friends. Conversely, a small percentage of respondents reported potentially harmful coping strategies, such as substance use. Only 12.0% of ObGyns reported having received professional support after exposure to an adverse event available at their hospital, and the majority of respondents considered the current professional support after adverse work-related events to be insufficient. It is recommended to increase awareness and improve the implementation of standardized support systems in hospitals.

Chapter 9

Chapter 9 describes the follow-up study of WATER-1: WATER-2 conducted in 2022. The results showed that 343 participants (response rate 18.8%) showed rates of depressive symptoms (4.4%), psychological distress (15.7%), and elevated point prevalence of anxiety (14.3%) when compared to the general population. Nearly all ObGyns experienced adverse work-related events, with a prevalence rate of current work-related PTSD of 0.9% (DSM-IV) and 1.2% (DSM-5). Notably, professional support after exposure to an adverse event was available in 61.3% of the workplaces, and was found to be sufficient by 92.6% of the respondents. While substantial improvements have been made in the availability and satisfaction of professional support, the prevalence rates of mental health issues among ObGyns remain high. Maintaining awareness and dialogue concerning physicians' mental wellbeing is crucial.

10.3 GENERAL DISCUSSION

In this final section, our results are discussed and implications are presented for clinical use and future research.

Chapter 2 shows that FoC is common in each trimester. Furthermore, the chapter showed that in the ***cross-sectional*** study design, point prevalence (***dichotomous*** FoC or no FoC) did not differ among trimesters. However, in the ***longitudinal*** sample, the ***overall mean sum scores*** decreased, resulting in a ***lower prevalence*** of FoC in the third trimester than that in the first trimester. Conducting both cross-sectional and longitudinal analyses offered important insight. Previous studies have shown conflicting results in the course of FoC during pregnancy, with reported patterns indicating a decrease[1,2], an increase[3], or no discernible change throughout the gestational period[4]. In our study, no newly diagnosed FoC occurred in women in the longitudinal sample. This suggests that the best time for screening is at the beginning of the pregnancy. Another important finding was that women with FoC were likely to actively seek help for their symptoms. It is necessary to emphasize the importance of adequate recognition of FoC since undiagnosed mental disorders will certainly be undertreated. Considering the presence of effective therapies[5,6], screening is warranted for the timely detection of FoC, facilitating intervention and contributing to improved fetomaternal outcomes. The findings of this study support the justification for first trimester pregnancy screening, ensuring comprehensive detection with no diagnosis of FoC emerging later in pregnancy within our study. Screening for FoC is already included in the Dutch Mind2Care screening for psychiatric or psychosocial problems and substance use[7] using the WDEQ-A[8] and is even possible with one (Fear of Childbirth-Postpartum-Visual Analogue Scale: FOCP-VAS)[9] or two questions (Fear of Birth Scale; FOBS)[10]. Although it is difficult to establish the added value of standard detection and treatment of psychosocial problems in all pregnancies, it is conceivable that more recognition and communication will result in positive effects[11] on the course of FoC. Regarding FoC, since a spontaneous decrease during pregnancy was found, future research should focus

on determining which pregnant women are more likely to benefit from psychological treatment, and which women are more likely to have spontaneous resolution of symptoms without additional treatment.

Chapter 3 was the first study to structurally assess trauma therapists' perceptions regarding trauma-focused therapy during pregnancy. Almost half of the therapists reported having heard that trauma-focused therapy (for PTSD) during pregnancy is potentially harmful. However, scientific evidence providing the scientific groundwork for these perceptions is lacking. When therapists performed treatment, most observed positive treatment effects, and only a small percentage reported adverse events. The study showed that there is a professional willingness to treat PTSD in pregnant women, even though no studies have evaluated its safety and efficacy during pregnancy. The divergence between therapists' hesitancy and the observed effectiveness of treatment highlights the need for future research on therapists' decision making.

Chapter 4 is the first systematic review to evaluate the effectiveness and safety of interventions for PTSD (symptoms) during pregnancy. Although the literature is scarce and the heterogeneity in study designs is large, 10 out of 13 included studies described improvement in PTSD symptoms with no report of adverse effects. However, there is insufficient evidence to draw definite conclusions regarding its efficacy, and more large-scale RCT's with a low risk of bias are needed. To compare the data and draw conclusions, an important issue for future PTSD research is to establish an official diagnosis of PTSD using a clinical interview and validated PTSD measurements across different measurement points.

An interesting paradox appears in **Chapters 3 and 4** in that it was found that on the one hand, some healthcare providers were reluctant to offer treatment during pregnancy, which has been proven effective for PTSD outside of pregnancy (**Chapter 3**). On the other hand, an empirical evidence base of some of the interventions for PTSD in pregnant women in our systematic review that were applied, interpersonal therapy[12] and hypnosis[13], is lacking, even in non-pregnant populations[14–17]. In non-pregnant individuals, it is a well-established fact that trauma-focused Cognitive Behavioral Therapy (CBT) and EMDR therapy are the most effective therapies in improving PTSD (symptoms)[18]. With this in mind, future research involving pregnant women might prioritize the establishment of safety and efficacy for interventions already internationally validated as effective treatments for equivalent mental health conditions in non-pregnant populations, which will optimize the likelihood of successful interventions for pregnant women while simultaneously mitigating the risk of harm or adverse effects.

The OptiMUM-study was the first randomized controlled trial (RCT) to evaluate the effectiveness of EMDR therapy in pregnant women with FoC (**Chapters 5, 6, 7**). Compared to Care-as-Usual, this study showed that EMDR therapy during pregnancy was safe and

that EMDR therapy was able to reduce symptoms of FoC with a large treatment effect. Interestingly, no significant difference between the two groups was found since the symptoms of FoC in the CAU group also decreased. The latter finding is consistent with the results of the longitudinal group in the HEAR-study described in **Chapter 2**. In the HEAR-study, recruitment took place at the same inclusion centers as in the OptiMUM-study, but after the OptiMUM-study inclusion period was completed. The longitudinal arm of the HEAR-study described that almost half of the women with FoC in their first trimester did no longer reported to have FoC in the longitudinal sample at 35 weeks gestation. This is in accordance with the CAU-group of the OptiMUM-study, in which 60% no longer met the criteria for FoC at approximately 32 weeks of gestation. This supports the hypothesis that in a substantial number of pregnant women, the natural course of FoC is to resolve itself. A third hypothesis is that the decrease in FoC symptoms is the result of treatment that women seek for their FoC. This third hypothesis is further supported by the finding that one in five women in our CAU group initiated psychological treatment for FoC outside the study. In this context, it is relevant that our studies were conducted in a high-income country, including an overrepresentation of highly educated cohabiting/married women, largely from a Dutch or other Western background, in an urban environment with a high density of EMDR therapists. The extent to which our results can be extrapolated to women with other demographic characteristics remains unclear. Future research should focus on identifying women who can overcome FoC without requiring extra psychological support or additional attention from their pregnancy care providers. Simultaneously, research should identify women who are more likely to benefit from additional treatment provided by mental healthcare providers. Future studies should aim to predict which women are more likely to benefit from one treatment over another, as other interventions for FoC have also been studied and proven effective, such as haptotherapy and mindfulness[5,6,18–20].

In addition to the type of treatment chosen in future studies, the qualifications of therapists are also important. In the OptiMUM-study, the EMDR therapy was conducted by highly qualified and experienced psychologists, who completed two years of postgraduate training, had at least one year of experience in providing EMDR therapy after they completed basic and advanced training in EMDR therapy, and participated in group supervision every three to four months.

It is widely recognized that a research setting may not faithfully replicate real-world complexities. Ensuring the broader real-world applicability of our findings requires acknowledging the variables that may differ between our study and an authentic setting. In the OptiMUM-study, specific inclusion and exclusion criteria were used that did not align with help requests from women in our clinical practice.

1) A gestational age between 8 and 20 weeks was an inclusion criterion; therefore, women who reported FoC later in pregnancy could not be included in the OptiMUM study. In our systematic review (**Chapter 7**), we also noted that four studies excluded

pregnant women in the third trimester of their pregnancy [19–22]. There might have been practical reasons for this, for example, sufficient time to plan therapeutic sessions or to avoid dropping out due to preterm birth. In contrast to the findings from the HEAR-study (**Chapter 2**), which suggest that new FoC diagnoses are unlikely to emerge late in pregnancy, our clinical experience suggests that some women report their symptoms for the first time during late pregnancy. The reasons behind this phenomenon remain uncertain, whether linked to an escalation of symptoms as childbirth approaches or a delayed expression of their needs. Nonetheless, this observation reflects the clinical reality encountered. In light of these findings, we have demonstrated that a decrease in the symptoms of PTSD and FoC can be achieved within only a few therapy sessions. Therefore, we strongly recommend not denying EMDR therapy to women in late pregnancy.

2) In the OptiMUM-study (**Chapters 4,5,6,7**) women were also excluded when they were under eight weeks gestational age. This also had practical research considerations, for example, to avoid dropout due to non-vital pregnancies or termination of pregnancy. However, when confronted with a new pregnancy, women with PTSD, and in specific PTSD after previous childbirth, may experience an acute increase in symptoms of PTSD; therefore, women in early pregnancy should not be withheld from treatment.
3) Women already undergoing any psychological treatment at the time of screening were excluded from the OptiMUM-study. This concerned 15% of pregnant women who screened positive for FoC. It is important for therapists treating women of childbearing age to ask about thoughts involving possible future pregnancies, or when they are pregnant, to ask about potential FoC.
4) In the PTSD-arm of the OptiMUM-study, the inclusion criteria included a strict definition of the 'traumatic event,' referring to a previous childbirth, and not anything else pregnancy- or birth-related. Whereas it is known that other pregnancy-related events such as miscarriage, ectopic pregnancy and medical interventions can cause PTSD[23], our strict inclusion criteria resulted in women with PTSD following for example a complicated dilatation and curettage (D&C) at 11 weeks, or a 'late miscarriage' at 15 weeks not being included in our study. In conclusion, it is important to acknowledge that there are more potential traumatic events related to pregnancy and childbirth than the previous childbirth itself, resulting in PTSD.
5) In the PTSD arm of the OptiMUM study, strict adherence to the DSM-5 A-criterion for PTSD was used, requiring "directly experiencing or witnessing actual or threatened death, serious injury, or sexual violence"[24]. Notably, the DSM-5 omitted the inclusion of a threat to a person's physical integrity, a component present in Criterion A of the DSM-IV. In clinical practice, it is not uncommon for women to describe giving birth as a distressing, painful, or degrading experience, even if it does not meet the DSM-5 A criterion. Paradoxically, these women may exhibit clinically relevant PTSD symptoms. Prior research[25] revealed that among 1599 participants, 1328 (83.1%) met the A-criterion based on the DSM-IV, and 1200 (75.0%) met the DSM-5 A criterion.

> Interestingly, 65 participants met the B, C, D, and E criteria of the DSM-5, but not the A-criteria, resulting in the absence of a formal PTSD diagnosis. Among these 65 participants, 26 (40%) met the DSM-IV A criterion (in addition to meeting the B, C, D, and E criteria) and consequently received a PTSD diagnosis. This observation underscores the need for further reflection on the definition of childbirth-related PTSD as it highlights the potential for inaccurate diagnoses leading to delayed or absent treatment.

It is important to emphasize that women with PTSD after childbirth should not be withheld from treatment or insurance coverage, solely on the basis of discussion about whether or not they meet the A-criterion for PTSD. Since, even nowadays, in developed countries, mothers and babies are still dying during childbirth, all childbirths can potentially lead to death or serious injury, thereby meeting the PTSD A criteria.

Furthermore, besides physical injury or violation, there is a growing call to emphasize women's subjective experiences of childbirth leading to the aftermath of PTSD, and that it is important to have a woman-centered and inclusive definition of traumatic childbirth. Leinweber et al (2022)[26] formulated the definition of a traumatic childbirth as "a woman's experience of interactions and/or events directly related to childbirth that caused overwhelming distressing emotions and reactions; leading to short and/or long-term negative impacts on a woman's health and wellbeing". Furthermore, when adopting a woman-centered approach, it is important to take into account the full range of PTSD symptoms and their impact on daily functioning, even if the formal diagnostic criteria for a full PTSD diagnosis are not met. While many PTSD studies adhere to strict definitions, in clinical practice, people do not always fulfil all diagnostic criteria, despite the presence of significant impairment and a request for treatment. As an example, the OptiMUM-study (**Chapter 5**) initially aimed to include pregnant women with a current full PTSD diagnosis using the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). However, the study faced difficulties in finding women who met the full diagnostic criteria for PTSD, which resulted in a lack of inclusion. This raises the question of how we can conduct scientific research utilizing the well-defined constructs of PTSD for the purpose of group and study comparisons while still maintaining a realistic reflection of everyday clinical practice and patients' daily life burden. This is exemplified by the recent findings of a pilot study demonstrating that women with traumatic childbirth experience who did not meet all criteria for PTSD still benefitted from EMDR therapy[27]. In addition, results from an RCT evaluating EMDR therapy in women with traumatic birth experiences are upcoming[28]. It is important to bridge the gap between the rigor of science and recognition of distress and impairment due to mental health issues in a real-world setting. This may involve incorporating a comprehensive approach that considers both the full diagnostic criteria for a condition as well as including those with partial symptoms and a high burden of disease.

Chapter 7 describes that EMDR therapy can be conducted during pregnancy without fear of harmful feto-maternal effects. A recent study[29] emphasized the importance of evaluating potential adverse effects in scientific research instead of focusing on effectiveness only. The meta-analysis, including non-pregnant individuals, showed that psychological interventions aimed at PTSD were not associated with an increased risk of harm compared to the control group. In pregnant women, evaluating the potential adverse effects of interventions is important since not one but two individuals may be affected. A recommendation for future studies aimed at determining the efficacy of interventions during pregnancy is to include obstetric outcome measurements, including those of the fetus and neonates.

Taken together, the studies in our manuscript regarding the safety and efficacy of EMDR therapy for pregnant women with PTSD after previous childbirth or FoC showed that EMDR therapy is not harmful, and as efficacious in decreasing symptoms of FoC as care as usual. Considering the short-term consequences of treatment delay and its impact on daily functioning, it is suggested to initiate therapy during pregnancy if the symptoms are present:

- are related to (or may affect) pregnancy, childbirth or future motherhood, and/or
- significantly affects daily functioning.

Consequently, the following women were indicated to start therapy:

- FoC.
- PTSD after previous childbirth.
- PTSD after sexual violence.
- PTSD after any traumatic event with daily burden of PTSD symptoms.

If the fear or PTSD is unrelated to the topic of motherhood and does not impact daily life, postponing treatment until after pregnancy may be considered.

Chapter 8 showed that work-related adverse events are inevitable for ObGyns and found an estimated point prevalence of 1.5% in ObGyns with current PTSD (WATER-1 study). Conversely, only 12% reported having a standardized protocol for support after adverse work-related events in 2014. Since the absence of protocolized support after experiencing a work-related adverse (and potentially traumatic) event is significantly associated with the development of probable PTSD[30], the need for standardized support for ObGyns after adverse work-related events was highlighted. In the years after 2014, much happened regarding the mental well-being of healthcare providers. The results of the WATER-1 study created awareness of the topic among Dutch gynaecologists, and a Committee for Collegial Support (CCO) was established to offer support to ObGyns after adverse work-related events. In 2016, the Dutch Federation of Medical Specialists recommended providing professional support to all hospitals. Worldwide, awareness and research regarding the impact of work-related adverse events among a variety of

healthcare providers has increased substantially, in which the COVID-19 pandemic has played an important role.

A follow-up study of WATER-1 was conducted in 2022 (WATER-2, **Chapter 9).** It showed that nowadays professional support was available more often (61.3%) than in 2014 (12.0%). However, this number is far from ubiquitous. If available, professional support was considered sufficient (92.6%). Conversely, the prevalence rates of anxiety, depression, and work-related PTSD appeared to be stable compared with those in 2014. In the face of elevated levels of burnout and dropout, prioritizing physicians' mental well-being is crucial. This underscores the ongoing need for a continuous and proactive commitment to improve mental health initiatives within the medical profession.

Clinical implications and recommendations

- Adequate recognition of FoC in pregnant women is important. Healthcare providers are encouraged to screen all women for FoC during the first half of their pregnancy by using a validated questionnaire (e.g., WDEQ-A).
- Pregnancy is not a contraindication for EMDR therapy. Therapists are advised to consider EMDR therapy for pregnant women with FoC- or childbirth-related PTSD.
- Therapists treating pregnant women should assess for the potential presence of FoC.
- Incorporating awareness of inevitable work-related adverse events, individual coping strategies, and peer support is recommended in the education of ObGyns.
- Each hospital should implement protocolized support for ObGyns after adverse work-related events.

Research implications and recommendations

- Future studies should evaluate which pregnant women with FoC are more likely to experience a spontaneous decrease in FoC versus which are more likely to benefit from psychological treatment.
- Studies regarding PTSD during pregnancy and postpartum might encompass women with both full and partial PTSD to provide a realistic representation of daily clinical practice.
- Additional research is needed to minimize the risk of traumatic childbirth itself or the development of PTSD following such experiences.
- It is strongly recommended that future research evaluating interventions during pregnancy focus on interventions that are already internationally acknowledged for the same psychological conditions in a non-pregnant population.
- Obstetric outcomes should be included in studies evaluating psychological treatments during pregnancy, as two individuals are affected.

REFERENCES

1. Huizink AC, Mulder EJ, Robies de Medina PG, Visser GH, Buitelaar JK. Is pregnancy anxiety a distinctive syndrome? Early Hum Dev. 2004;79(2):81–91.
2. Hildingsson I, Haines H, Karlstrom A, Nystedt A. Presence and process of fear of birth during pregnancy: Findings from a longitudinal cohort study. Women and birth. 2017;30(5):242–7.
3. Hildingsson I, Nilsson C, Karlstrom A, Lundgren I. A longitudinal survey of childbirth-related fear and associated factors. J Obstet Gynecol neonatal Nurs. 2011;40(5):532–43.
4. Rothenberger SE, Moehler E, Reck C, Resch F. Prenatal stress: course and interrelation of emotional and physiological stress measures. Psychopathology. 2011;44(1):60–7.
5. Klabbers GA, Wijma K, Paarlberg KM, Emons WHM, Vingerhoets AJJM. Haptotherapy as a new intervention for treating fear of childbirth: a randomized controlled trial. J Psychosom Obs Gynaecol. 2019;40(1):38–47.
6. Veringa-Skiba IK, de Bruin EI, van Steensel FJA, Bögels SM. Fear of childbirth, nonurgent obstetric interventions, and newborn outcomes: A randomized controlled trial comparing mindfulness-based childbirth and parenting with enhanced care as usual. Birth. 2022;49(1):40–51.
7. Quispel C, Harrak MC, Vankan-Buitelaar S, Cohen de Lara M, Stevens AWMM, de Kruijf I, et al. Mental problems, psychosocial problems and substance use during pregnancy: a structured multidisciplinary approach reduces the child's risk. Ned Tijdschr Geneeskd. 2022;june(16):D6320.
8. Garthus-Niegel S, Størksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol. 2011;32(3):160–3.
9. Veringa-Skiba IK, de Bruin EI, Mooren B, van Steensel FJA, Bögels SM. Can a simple assessment of fear of childbirth in pregnant women predict requests and use of non-urgent obstetric interventions during labour? Midwifery [Internet]. 2021;97(February):102969. Available from: https://doi.org/10.1016/j.midw.2021.102969
10. den Boer I, Hendrix YMGA, Knoop H, van Pampus MG. Identifying women with fear of childbirth with the Dutch Fear of Birth Scale and its added value for consultations. J Psychosom Obstet Gynecol [Internet]. 2022;43(4):419–25. Available from: https://doi.org/10.1080/0167482X.2021.2013797
11. McKenzie-McHarg K, Crockett M, Olander EK, Ayers S. Think pink! A sticker alert system for psychological distress or vulnerability during pregnancy. Br J Midwifery. 2014;22(8):590–5.
12. Zlotnick C, Capezza N, Parker D. An interpersonally based intervention for low-income pregnant women with intimate partner violence: a pilot study. Arch Womens M. 2011;14(1):55–65.
13. Slater P. Post-traumatic stress disorder managed successfully with hypnosis and the rewind technique : two cases in obstetric patients. Int J Obstet Anesth. 2015;24(3):272–5.
14. Markowitz J, E P, Neria Y, Van Meter P, Zhao Y, Hembree E, et al. Is Exposure Necessary? A Randomized Clinical Trial of Interpersonal Psychotherapy for PTSD. Am J Psychiatry. 2015;172(5):430–40.
15. O'Toole S, Solomon S, Bergdahl S. A Meta-Analysis of Hypnotherapeutic Techniques in the Treatment of PTSD Symptoms. J Trauma Stress. 2016;29(1):97–100.
16. NICE. Post-traumatic stress disorder. Evidence reviews on care pathways for adults, children and young people with PTSD. 2018. p. Retrieved from https://www.nice.org.uk/ guidance/n.

17. Akwa GGZ. GGZ zorgstandaard "Psychotrauma- en stressorgerelateerde stoornissen" [Internet]. 2020. Available from: https://www.ggzstandaarden.nl/zorgstandaarden/psychotrauma-en-stressorgerelateerde-stoornissen/behandeling-en-begeleiding/psychologische-behandeling-volwassenen/bij-posttraumatische-stressstoornis-ptss

18. Yunitri N, Chu H, Kang XL, Wiratama BS, Lee TY, Chang LF, et al. Comparative effectiveness of psychotherapies in adults with posttraumatic stress disorder: a network meta-analysis of randomised controlled trials. Psychol Med. 2023;1–13.

19. Madigan S, Vaillancourt K, Mckibbon A, Benoit D, Madigan S, Vaillancourt K, et al. Trauma and traumatic loss in pregnant adolescents : the impact of Trauma-Focused Cognitive Behavior Therapy on maternal unresolved states of mind and Posttraumatic Stress Disorder. Attach Hum Dev. 2015;17(2):175–98.

20. Seng JS, Oakley DJ, Sampselle C., Killion C, Graham-Bermann S, Liberzon I. Posttraumatic stress disorder and pregnancy complications. Obstet Gynecol. 2001;97(1):17–22.

21. Stevens NR, Lillis TA, Wagner L, Tirone V, Hobfoll SE, Lillis TA, et al. A feasibility study of trauma-sensitive obstetric care for low-income, ethno-racial minority pregnant abuse survivors. J Psychosom Obstet Gynecol. 2019;40(1):66–74.

22. Weinreb L, Wenz-gross M, Upshur C. Postpartum outcomes of a pilot prenatal care-based psychosocial intervention for PTSD during pregnancy. Arch Womens Ment Heal. 2018;21(3):299–312.

23. Farren J, Jalmbrant M, Ameye L, Joash K, Mitchell-Jones N, Tapp S, et al. Post-traumatic stress anxiety and depression following miscarriage or ectopic pregnancy: A prospective cohort study. BMJ Open. 2016;6(11).

24. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (fifth edition). Washington, DC; 2013.

25. van Heumen MA, Hollander MH, van Pampus MG, van Dillen J, Stramrood CAI. Psychosocial Predictors of Postpartum Posttraumatic Stress Disorder in Women With a Traumatic Childbirth Experience. Front Psychiatry. 2018;9(July):1–9.

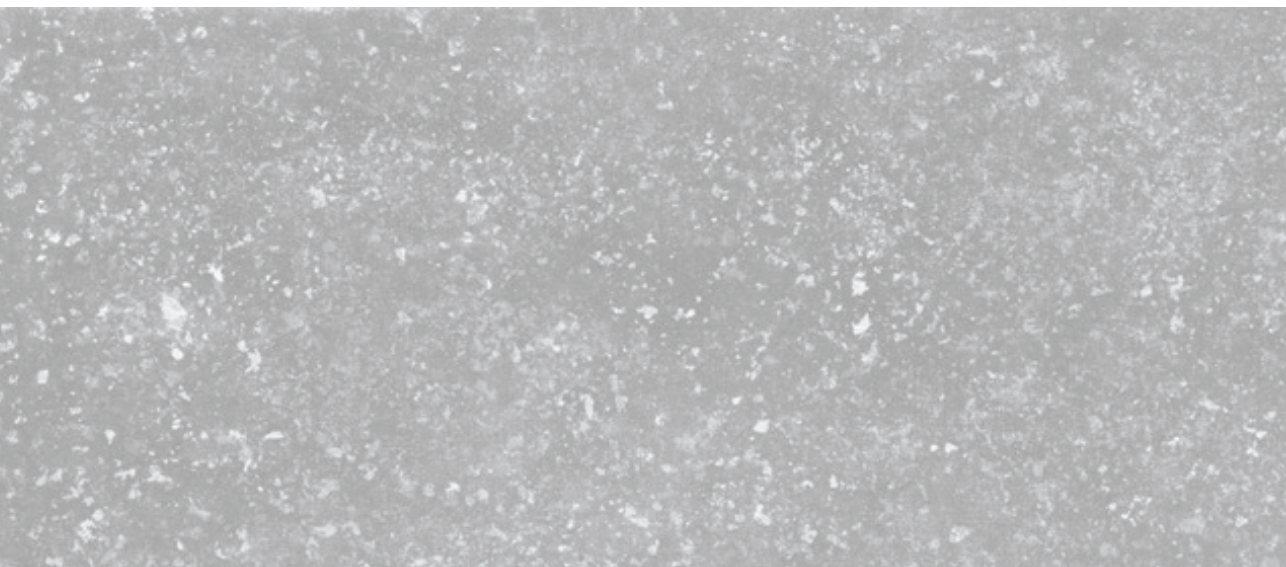
26. Leinweber J, Fontein-Kuipers Y, Thomson G, Karlsdottir SI, Nilsson C, Ekström-Bergstroöm A, et al. Developing a woman-centered, inclusive definition of traumatic childbirth experiences: A discussion paper. Birth. 2022;49:687–96.

27. Kopmeiners EHM, Hollander MH, van Voorst N, Stramrood CAI. Effect of early postpartum EMDR on reducing psychological complaints in women with a traumatic childbirth experience. J Psychosom Obstet Gynecol. 2023;44(1).

28. Hendrix YMGA, van Dongen KSM, de Jongh A, van Pampus MG. Postpartum Early EMDR therapy Intervention (PERCEIVE) study for women after a traumatic birth experience: study protocol for a randomized controlled trial. Trials. 2021;22(1):1–11.

29. Hoppen TH, Lindemann AS, Morina N. Safety of psychological interventions for adult post-traumatic stress disorder: Meta-analysis on the incidence and relative risk of deterioration, adverse events and serious adverse events. Br J Psychiatry. 2022;221(5):658–67.

30. Scheepstra KWF, Pauw HS, Van Steijn ME, Stramrood CAI, Olff M, Van Pampus MG. Potential traumatic events in the workplace and depression, anxiety and post-traumatic stress: A cross-sectional study among Dutch gynaecologists, paediatricians and orthopaedic surgeons. BMJ Open. 2020;10(9):1–8.



APPENDICES

APPENDIX A:

Nederlandse samenvatting

“ANGST EN POSTTRAUMATISCHE STRESSSTOORNIS IN DE VERLOSKUNDE: VERBETERING VAN DE ZORG VOOR ZWANGEREN EN HUN ZORGVERLENERS”

Het centrale thema van dit proefschrift betreft angst en trauma in de obstetrie, zowel bij patiënten als zorgverleners. Het doel was het vergroten van de kennis en versterken van het wetenschappelijk fundament voor de behandeling van zwangeren met een posttraumatische stressstoornis (PTSS) of bevalangst. Daarnaast wilden we inzicht krijgen in de (impact van) werkgerelateerde ingrijpende gebeurtenissen onder Nederlandse gynaecologen (in-opleiding) en de huidige en gewenste opvang.

DEEL 1: IDENTIFICATIE

Deel 1 omvat de resultaten van de HEAR-studie, de VIP-studie, en een systematisch literatuuronderzoek en casusbeschrijving.

De HEAR-studie (**Hoofdstuk 2**) had als doel meer kennis te krijgen over de prevalentie en het beloop van bevalangst tijdens de zwangerschap, en de invloed van bevalangst op de behoefte aan hulp en de voorkeursmanier van bevallen. Bevalangst werd gemeten met de *Wijma Delivery Expectancy Questionnaire* versie A (WDEQ-A), zowel op een continue schaal als dichotoom. Er werd zowel een cross-sectionele als longitudinale analyse uitgevoerd. In totaal namen 364 vrouwen die voor het eerst zouden gaan bevallen aan het onderzoek deel, waarvan 118 vrouwen ook deelnamen in de longitudinale analyse. In de cross-sectionele meting had 18.4% van de vrouwen bevalangst. Het percentage vrouwen met bevalangst verschilde niet significant tussen de trimesters. In de longitudinale analyse daalde dit percentage tot 11%, waarbij ook de gemiddelde somscores afnamen. Een klein aantal vrouwen vertoonde een toename van de somscore van bevalangst, maar zonder de afkapwaarde voor nieuw ontstane bevalangst te overschrijden. Vrouwen met bevalangst hadden vaker de voorkeur voor een geplande keizersnede en farmacologische pijnbestrijding tijdens de bevalling. Bovendien zochten zij vaker hulp voor hun bevalangst, waarbij de voorkeur uitging naar de verloskundige om dit te bespreken.

De VIP-studie **(Hoofdstuk 3)** onderzocht hoe therapeuten denken over de behandeling van PTSS tijdens de zwangerschap. In deze cross-sectionele studie deden 301 Nederlandse therapeuten mee. Ongeveer de helft (48.8%) had eerder gehoord van mogelijke schade door trauma-gerichte behandeling tijdens de zwangerschap, namelijk negatieve effecten op de moeder en het ongeboren kind. Hoewel 30.5% van de therapeuten daardoor terughoudend was in het behandelen van PTSS bij zwangeren, had 81.7% ervaring met dergelijke behandelingen. Zowel in de algemene als zwangere patiëntenpopulatie had EMDR-therapie de voorkeur van de therapeuten. In de praktijk beschreven zij een afname van PTSS-klachten, waarbij slechts een minderheid negatieve effecten van de therapie rapporteerde, zoals toename van PTSS en stress.

Het literatuuronderzoek (**Hoofdstuk 4**) werd uitgevoerd om een overzicht te krijgen van de al bestaande kennis over veiligheid en effectiviteit van behandelingen voor zwangeren met PTSS. Er werden dertien geschikte studies over acht soorten behandelingen

gevonden. Niet alle studies richtten zich ook op mogelijke negatieve effecten, maar in de studies die dat wel deden werden geen negatieve effecten gevonden. In tien studies verbeterden de PTSS-symptomen, waarvan vier studies significante verbetering lieten zien. Er zijn echter beperkingen bij de geïncludeerde studies, zoals methodologische tekortkomingen, kleine steekproefgroottes, en veelal een hoog risico op vertekening van de resultaten, hetgeen het trekken van definitieve conclusies bemoeilijkt. **Hoofdstuk 4** voegde ook een casusbeschrijving toe aan de literatuur: een zwangere met PTSS na een eerdere intra-uteriene vruchtdood kreeg drie sessies EMDR-therapie. Nadien (bij 36 weken zwangerschapsduur maar ook postpartum) had zij niet langer meer last van bevalangst en voldeed zij niet langer aan de diagnostische criteria van PTSS. Er werden geen negatieve effecten gevonden. Hoewel de resultaten veelbelovend zijn, is meer en beter onderzoek nodig om de veiligheid en effectiviteit van traumagerichte therapie tijdens de zwangerschap beter te begrijpen.

DEEL 2: BEHANDELING

Deel 2 beschrijft het ontwerp en de resultaten van de OptiMUM-studie: een gerandomiseerd onderzoek naar EMDR-therapie bij zwangeren met PTSS na een vorige bevalling, of bevalangst.

In **Hoofdstuk 5** wordt het ontwerp van de OPTIMUM-studie beschreven. De studie onderzocht de veiligheid en effectiviteit van EMDR-therapie bij zwangeren met (1) PTSS na een eerdere bevalling, of (2) bevalangst. Alle zwangeren tussen 8 en 20 weken zwangerschapsduur werden gescreend middels vragenlijsten op PTSS (*PTSD Checklist for DSM-5*; PCL-5) of bevalangst (WDEQ-A). Bij een score boven de afkapwaarde werden zij uitgenodigd voor een klinisch interview, waar onder andere de *Clinician Administered PTSD Scale* (CAPS-5) werd gebruikt voor de daadwerkelijke diagnose van PTSS. Vrouwen met PTSS na eerdere bevalling (N=50) of bevalangst (N=140) werden gerandomiseerd tussen drie sessies EMDR therapie of de gewone zwangerschapsbegeleiding. Vervolgens werden de ernst van de symptomen van PTSS en bevalangst gemeten, evenals psychologische, verloskundige en neonatale.

In **Hoofdstuk 6** worden de psychologische resultaten van de studie beschreven. In totaal deden 141 vrouwen met bevalangst mee, waarbij 70 van hen werden toebedeeld aan EMDR-therapie en 71 aan de gewone zwangerschapsbegeleiding. Er werden geen verschillen in negatieve uitkomsten gevonden. Qua positieve uitkomsten bleek dat beide groepen vrouwen een sterke vermindering van hun bevalangst rapporteerden, en er geen significant verschil tussen de groepen kon worden geconstateerd. EMDR-therapie bij zwangeren met bevalangst lijkt dus veilig en effectief, maar niet beter dan de gebruikelijke zwangerschapsbegeleiding.

In **Hoofdstuk 7** werden de verloskundige resultaten van de studie beschreven van de 141 vrouwen met bevalangst. Maternale, verloskundige en neonatale uitkomsten, bevalervaring en patiënttevredenheid over zwangerschap en bevalling werden geanalyseerd. Het enige verschil tussen de groepen was dat vrouwen in de EMDR-groep zevenmaal minder vaak een inleiding zonder medische reden verzochten in vergelijking met vrouwen die de gewone zwangerschapsbegeleiding kregen. Alle andere uitkomstmaten tussen de groepen verschilden niet. Opmerkelijk was het hoge percentage bevallingen middels een keizersnede in beide groepen (37.2%). Er werd geconcludeerd dat EMDR-therapie in de zwangerschap veilig is.

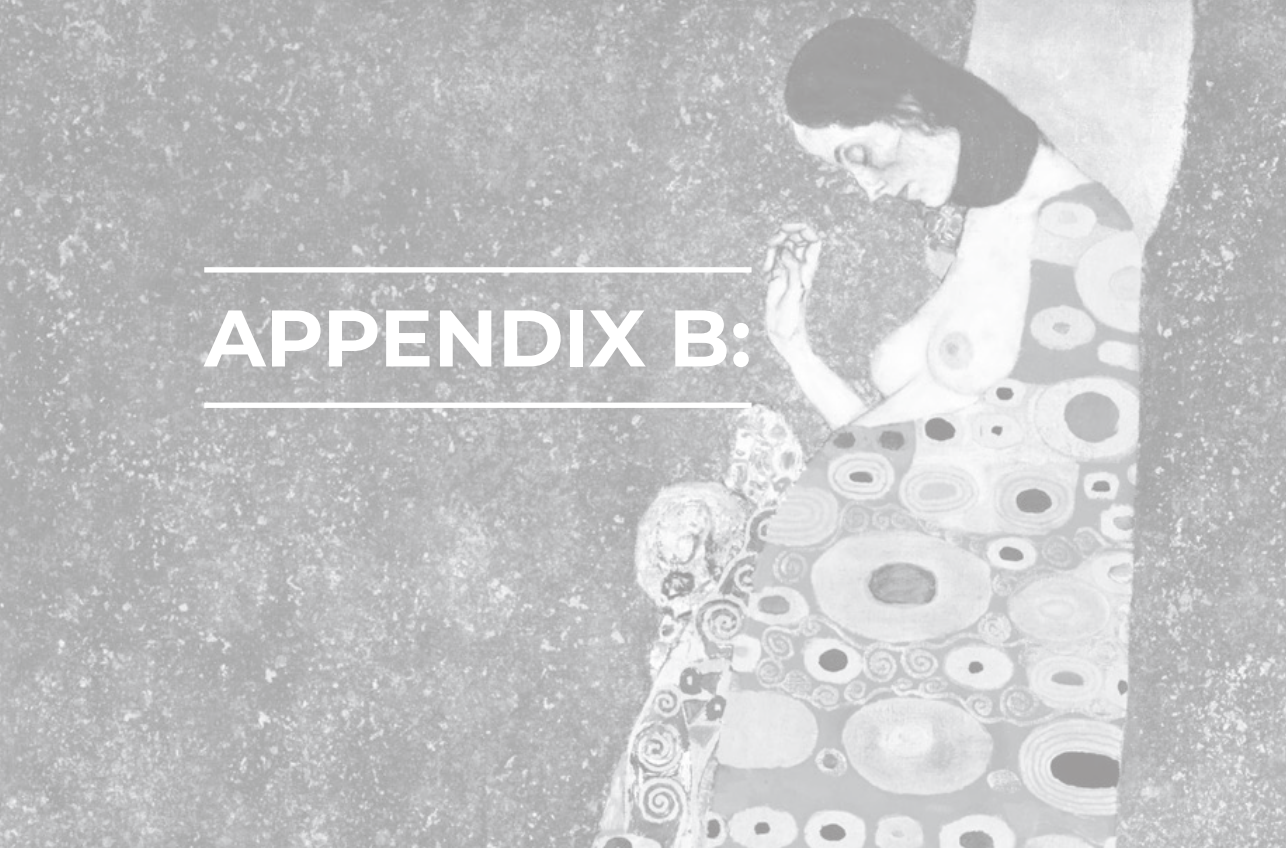
DEEL 3: ZORGVERLENERS

In deel drie worden de WATER-studies 1 en 2 beschreven: een vragenlijstonderzoek onder Nederlandse gynaecologen (in opleiding) naar werkgerelateerde ingrijpende gebeurtenissen.

In **Hoofdstuk 8** worden de resultaten van het eerste onderzoek uit 2014 onder Nederlandse gynaecologen (in-opleiding) beschreven. Van het beroepsregister reageerde 42.8%, waarvan 683 vragenlijsten werden geanalyseerd. Van de 12.6% die meldde een potentieel traumatische gebeurtenis te hebben meegemaakt, minstens vier weken geleden, bleek 1 op 10 (11.8%) een score indicatief voor PTSS te hebben. Dit staat gelijk aan 1.5% van de gynaecologen (in-opleiding) die mogelijk een huidige PTSS hadden, wat hoger is dan PTSS (wel- of niet werkgerelateerd) in de algemene Nederlandse bevolking. Meest genoemde manieren om met werkgerelateerde ingrijpende gebeurtenissen om te gaan waren steun zoeken bij collega's, familie of vrienden, een complicatiebespreking houden, en afleiding zoeken. Een minderheid (12.0%) rapporteerde de aanwezigheid van professionele opvang op het werk. Wanneer gevraagd werd wat voor opvang gewenst zou zijn werd het meest (82.0%) ondersteuning van directe collega's genoemd.

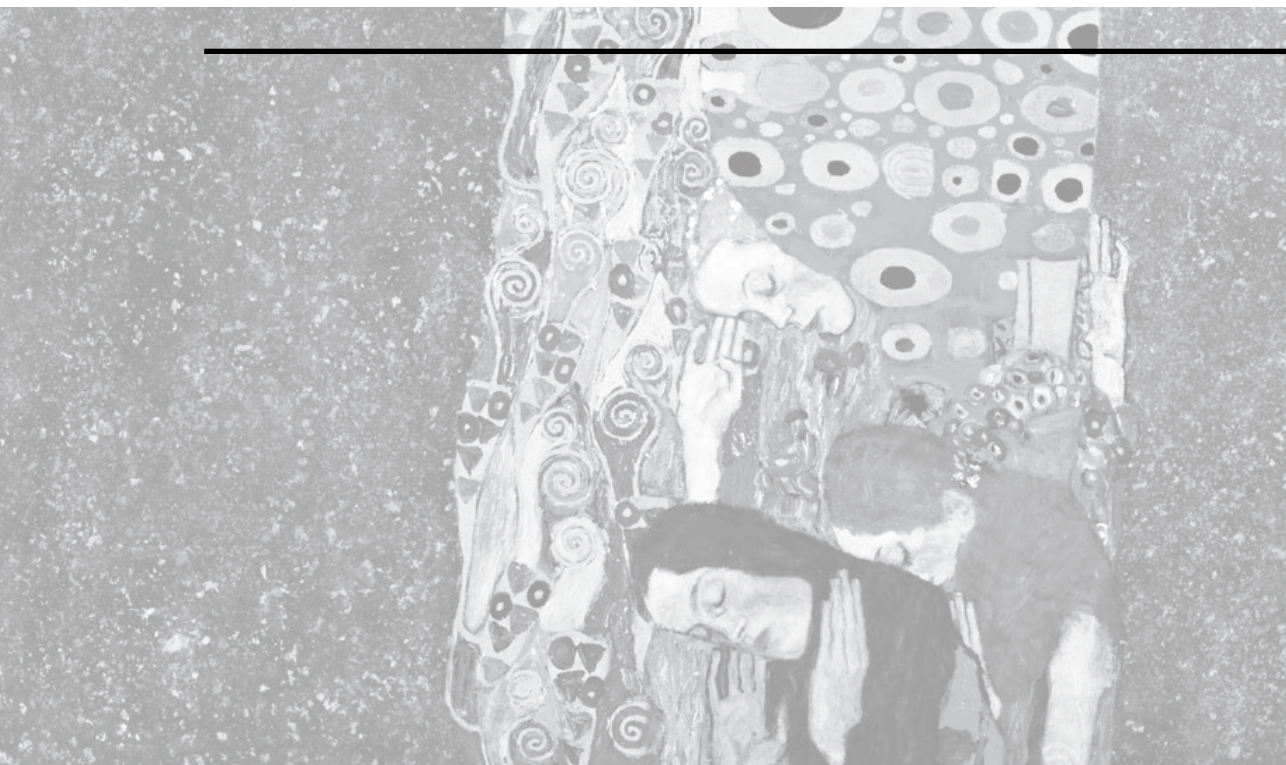
Om aan te tonen hoe het daarna is gegaan met ingrijpende gebeurtenissen op de werkvloer en de opvang daarna wordt in **Hoofdstuk 9** een vervolgonderzoek uit 2022 beschreven (WATER-2). Onder 343 respondenten (18.8% respons) werden hoge percentages gevonden van met name angst (14.3%), psychologische stress (15.7%) en werkgerelateerde PTSS (0.9-1.2%). Bij 4.4% werden indicaties voor de aanwezigheid van een depressie gevonden. Vrijwel alle gynaecologen (in-opleiding) rapporteerden wel eens ingrijpende gebeurtenissen te hebben meegemaakt. Van alle respondenten rapporteerde 61.3% dat er bij hen professionele opvang op de werkvloer aanwezig was. Van deze mensen vond 92.6% dit voldoende. Concluderend valt met name op dat er bij veel meer gynaecologen (in-opleiding) nu professionele opvang na ingrijpende gebeurtenissen op de werkvloer aanwezig is, alhoewel mentale problemen nog steeds veel voorkomen.

Op basis van alle gepubliceerde onderzoeken in dit proefschrift kan worden geconcludeerd dat het adequaat herkennen van bevalangst belangrijk is. Vrouwen zoeken vaak hulp voor hun klachten, en willen graag hun verloskundige als eerste aanspreekpunt. Er is geen contra-indicatie voor EMDR therapie: deze lijkt veilig te kunnen worden toegepast in de zwangerschap, hoewel de effectiviteit op groepsniveau bij vrouwen met bevalangst niet beter lijkt te zijn vergeleken met de gewone zwangerschapsbegeleiding. Ook zorgverleners maken frequent ingrijpende gebeurtenissen op de werkvloer mee, wat bij een deel tot PTSS-klachten lijdt. Alhoewel professionele opvang na ingrijpende gebeurtenissen op de werkvloer tegenwoordig vaker beschikbaar is, geldt dit nog zeker niet voor iedereen.



APPENDIX B:

Co-authors and contributions



LIST OF ARTICLES IN THIS THESIS:

Chapter 2:
Hendrix YMGA, Baas MAM, Vanhommerig JW, de Jongh A, van Pampus MG. Fear of Childbirth in Nulliparous Women. Front Psychol. 2022;13:923819. doi: 10.3389/fpsyg.2022.923819.

Chapter 3:
Hendrix YMGA, Sier MAT, Baas MAM, van Pampus MG. Therapist perceptions of treating posttraumatic stress disorder in pregnancy: The VIP Study. J Trauma Stress. 2022;35(5):1420-31. doi: 10.1002/jts.22842.

Chapter 4:
Baas MAM, van Pampus MG, Braam LS, Stramrood CAI, de Jongh A. The effects of PTSD treatment during pregnancy: systematic review and case study. Eur J Psychotraumatol. 2020;11(1):1762310, doi: 10.1080/20008198.2020.1762310.

Chapter 5:
Baas MAM, Stramrood CAI, Dijksman LM, de Jongh, A., van Pampus MG. The OptiMUM-study: EMDR therapy in pregnant women with Posttraumatic Stress Disorder after previous childbirth and pregnant women with fear of childbirth: design of a multicentre randomized controlled trial. Eur J Psychotraumatol. 2017;8(1):1293315. Doi: 10.1080/20008198.2017.1293315.

Chapter 6:
Baas MAM, van Pampus MG, Stramrood CAI, Dijksman, LM, Vanhommerig JW, de Jongh A. Treatment of pregnant women with Fear of Childbirth using EMDR therapy: results of a multi-centre randomized controlled trial. Front. Psychiatry 2022;12:798249. Doi: 10.3389/fpsyt.2021.798249.

Chapter 7:
Baas MAM, Stramrood CAI, Dijksman LM, Vanhommerig JW, de Jongh A, van Pampus MG. How safe is the treatment of pregnant women with fear of childbirth using eye movement desensitization and reprocessing therapy? Obstetric outcomes of a multi-center randomized controlled trial. Acta Obstet Gynecol Scand. 2023;102(11):1575-85. Doi: 10.1111/aogs.14628.

Chapter 8:
Baas MAM, Scheepstra KWF, Stramrood, CAI, Evers, R, Dijksman, LM, van Pampus MG. Work-related adverse events leaving their mark: a cross-sectional study among Dutch gynecologists. BMC Psychiatry. 2018;18(1):73. Doi: 10.1186/s12888-018-01659-1.

Chapter 9:
Baas MAM, Stramrood CAI, Molenaar JE, van Baar PM, Vanhommerig JW, van Pampus MG. Continuing the conversation: a cross-sectional study about the effects of work-related adverse events on the mental health of Dutch (resident) obstetrician-gynaecologists (ObGyns). *BMC Psychiatry. 2024. doi 10.1186/s12888-024-05678-3 (in press)*

LIST OF CO-AUTHORS

P.M. van Baar (PvB)
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands
Amsterdam Reproduction and Development Research Institute, Amsterdam UMC, Amsterdam, the Netherlands

L.S. Braam (LS)
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands

L.M. Dijksman (LD)
Department of Quality and Safety, St. Antoniusziekenhuis, Nieuwegein, the Netherlands.

R. Evers (RE)
Talmor, Amsterdam, the Netherlands

J.W. Vanhommerig (JV)
Department of Research and Epidemiology, OLVG, Amsterdam, the Netherlands.

Y.M.G.A. Hendrix (YH)
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands

A. de Jongh (AdJ)
Academic Centre for Dentistry Amsterdam (ACTA), University of Amsterdam and VU University Amsterdam, The Netherlands.
PSYTREC, Bilthoven, The Netherlands.
School of Health Sciences, Salford University, Manchester, United Kingdom.
Institute of Health and Society, University of Worcester, United Kingdom
School of Psychology, Queen's University, Belfast, Northern Ireland, United Kingdom

J.E. Molenaar
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands

M.G. van Pampus (MP/MvP)
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands

K.W.F. Scheepstra (KS)
Department of Psychiatry, Amsterdam UMC, Amsterdam, the Netherlands

M.A.T. Sier (MS)
Department of Obstetrics and Gynaecology, OLVG, Amsterdam, the Netherlands

C.A.I. Stramrood (CS).
Beval Beter, PO Box 345, 1000 AH Amsterdam, the Netherlands.

CONTRIBUTIONS:

Chapter 2:
YH: conceptualization, methodology, formal analysis, investigation, resources, and writing—original draft. MB: conceptualization, resources, and writing—review and editing. JV: methodology and formal analysis. AdJ: writing—review and editing and supervision. MP: conceptualization, writing—review and editing, and supervision. All authors contributed to the article and approved the submitted version.

Chapter 3:
Conceptualization: YH, MB, MvP. Methodology, analysis, writing: YH, MS. Review and editing: MB, MvP. All authors contributed to the article and approved the submitted version.

Chapter 4:
Conceptualization of the case series: all authors. Conceptualization of the systematic review: MB, AdJ, MvP. Data-analysis: MB, LB. Writing: MB. Critically revising the manuscript and accepting the final manuscript: all authors.

Chapter 5:
All authors have made substantial contributions to the concept of this study. MB drafted the paper under supervision of CS, LD, AdJ and MvP. All authors were involved in critically revising the manuscript, and accept the final manuscript.

Chapter 6:
All authors have made substantial contributions to the concept of this study. MB drafted the paper under supervision of AdJ and MvP. MB analysed the data with support of JV. All authors were involved in critically revising the manuscript, and accept the final manuscript.

Chapter 7:
All authors have made substantial contributions to the design of this study and were involved in critically revising the manuscript and accepted the final manuscript. MB drafted

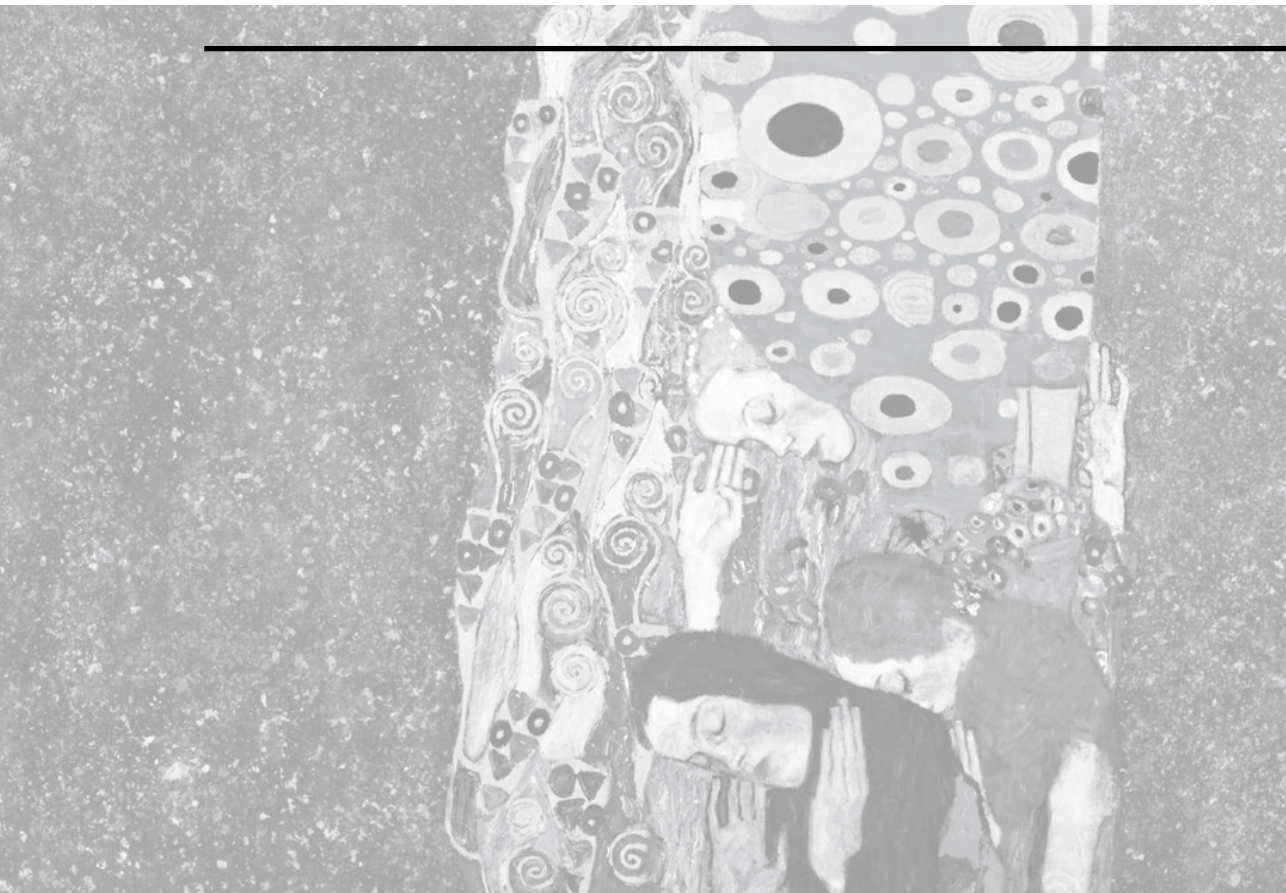
the current manuscript under supervision of AdJ and MvP. MB analysed the data with support of JV.

Chapter 8:
MB, MvP, RE and CS designed the study. MB and KS collected and analysed the data with support of LD. MB and KS drafted the manuscript and have contributed equally. All authors contributed to and approved the final manuscript.

Chapter 9:
JM, PvB, CS and MvP drafted the study and collected the data. JM and MB analysed the data with support of JV. JM and MB KS drafted the manuscript. All authors contributed to and approved the final manuscript.

APPENDIX C:

Dankwoord



Naast uren alleen achter mijn computer, soms tot in het holst van de nacht, is het belangrijk om te benadrukken dat promoveren een teamprestatie is. Er zijn veel mensen met elk hun aandeel in het voltooien van de onderzoeksprojecten en deze promotie, die ik hierbij graag wil bedanken.

Dit proefschrift had niet mogelijk kunnen zijn zonder alle zwangere vrouwen en hulpverleners die hebben deelgenomen aan de studies. Daarom wil ik de zwangere vrouwen bedanken die, zonder duidelijk voordeel voor zichzelf, de tijd en moeite hebben genomen om deel te nemen aan wetenschappelijk onderzoek in een periode in hun leven waar je vaak al genoeg aan je hoofd hebt. Ten tweede wil ik de hulpverleners bedanken die hun verhaal en gevoelens hebben gedeeld in het onderzoek naar de gevolgen van ingrijpende gebeurtenissen op de werkvloer. Bedankt voor het laten zien van je kwetsbare kanten, om samen te zorg te verbeteren.

Copromotoren (Dr. M.G. van Pampus, dr. C.A.I Stramrood)

Beste dr. Van Pampus, beste Mariëlle. Toen ik in 2013 een open sollicitatie voor een (junior) onderzoekersfunctie stuurde, had ik niet gedacht dat dit daar allemaal uit zou voortkomen. In de jaren die volgden heb ik je de Capture-group onderzoeksgroep zien opzetten, waarmee je laat zien dat investigator-initiated onderzoek vanuit de periferie ontzettend belangrijk is. Dit was nooit gelukt zonder jouw grote doortastendheid in het combineren van kliniek en wetenschap. Het belang van jouw bijdrage aan de verbetering van de zorg voor zowel zwangeren als hulpverleners valt niet te onderschatten.

Claire, ik ben trots jouw ‘opvolger- promovendus te mogen zijn. Je hebt de basis gelegd met je case series voor het opzetten van de OptiMUM-studie. Ik vind het prachtig te zien hoe jij jezelf als topexpert hebt doorontwikkeld op het gebied van angst en trauma onder zwangeren, en dat je bijdrage als gynaecoloog niet hoeft op te houden waar het ziekenhuis eindigt.

Promotor (prof. dr. A. de Jongh)

Geachte prof. dr. de Jongh, beste Ad. Ik heb het je nooit gevraagd, maar zou toch graag willen weten hoe je 30 uren in een dag stopt. Je snelle reactietijden gecombineerd met feedback van hoge kwaliteit waardeer ik enorm. Je bijdrage aan het wetenschappelijk onderzoek naar EMDR-therapie is immens, en daarmee ook de impact op het leven van veel mensen met (o.a.) PTSS. Ik heb deze periode veel van je mogen leren.

Promotiecommissie

Geachte leden van de leescommissie. Dank voor uw bijdrage aan de wetenschap en specifiek aan mijn promotie. Ik kijk uit naar het discussiëren over dit proefschrift.

Paranimfen (dr. D.S. van Dam, E.T.H. Baas)

Lieve Daniëlla, je bent mijn steun en toeverlaat geweest in dit traject. Met jouw ervaring, empathische vermogens, analytische blik en oneindig vertrouwen in mij, heb je mij de steun kunnen geven waar ik die nodig had. Daarnaast is onze jarenlange vriendschap me zeer lief.

Lieve Edwin, lieve broer. Je nuchtere, academische, niet-medische blik was heerlijk verhelderend gedurende dit project. Met discussiëren zijn we aan elkaar gewaagd, en ik vind het prachtig dat je naast me kan staan op deze belangrijke dag.

Dankjulliewel voor jullie onmisbare steun!

Dank Capture-group collega's. Minouk, Karel en Yvette, wat had ik graag vaker aan een bureautje naast jullie gezeten om kennis en ervaringen te delen, maar als buitenpromovendus naast een A(N)IOS-baan zat dat er helaas niet in. Jullie peer support in dit gedeelde avontuur is me zeer dierbaar!

Beste stagiairs, Anne, Sander, Bo, Laura en Bibi: dank voor al jullie werk en voor de nieuwe energie die jullie meebrachten. Het was bovendien prachtig jullie leercurve te zien. Het ga jullie goed in jullie verdere carrière!

Dank leden van het OLVG wetenschapsbureau. Het was mooi om met jullie mee te groeien, en te zien hoe er nu een geweldige staat van dienst is in het doen van perifeer onderzoek. In het bijzonder dank aan Lea en Joost voor de geweldige ondersteuning, die tot ver buiten statistiek alleen reikte. Dank ook Bert Berenschot, clinical librarian, voor de hulp bij de systematic review. Het OLVG kan trots op jullie zijn!

Zonder financiële ondersteuning was de OptiMUM-studie niet mogelijk geweest. Dank: Stichting EMDR Nederland (Dutch EMDR Association), Fonds Gezond Geboren, Stichting Teaching Hospital OLVG and Stichting Wetenschap OLVG, voor het vertrouwen in ons onderzoek.

Met name voor de OptiMUM-studie zijn er zeer veel mensen die een steentje hebben bijgedragen aan de logistiek in alle centra. Zeer hartelijk dank aan allen die zwangeren voor deelname aan deze studie hebben benaderd en aan de poli-assistenten van OLVG voor de onmisbare ondersteuning in de logistiek.

Specifiek wil ik alle eerstelijns verloskundigenpraktijken bedanken, die zonder inclusievergoeding al die jaren hebben geïncludeerd. Ik voel mij gezegend dat we door een gezamenlijk doel na te streven zonder schuttingen tussen intra- en extramuraal deze studie hebben kunnen uitvoeren. Bedankt NOVA, Astrid Limburg, Ruyschstraat, Oostelijke Eilanden, Witsenkade en natuurlijk ook het toenmalige OLVG-West en AMC.

Dank aan POP-poli verloskundigen Rebecca en Ineke, die in het begin van de studie ons hebben versterkt bij de klinische interviews.

De OptiMUM-studie heeft een topteam van psychologen gehad: Dafna Zwarts, Jaro van der Ende, Merith Cohen de Lara, Nicolette van der Meer, Tamar Drescher, Mirjam Heinemans en Maike Leenders. Jullie zijn een aanwinst voor het vak, en het was indrukwekkend om bij de EMDR supervisie-avonden te zijn. Dank voor jullie inzet!

Dank aan alle mensen die mij ooit ergens in mijn carrière de meerwaarde van wetenschappelijk onderzoek naast je klinisch werk doen hebben voorgeleefd, en mij daarbij geïnspireerd hebben. Prof. Berthold Gersons, die mijn masterthesis Psychologie begeleidde en daarmee de basis legde voor mijn wetenschappelijke liefde. Prof. Raoul Hennekam, bij wie ik onderzoek mocht doen naar het zeldzame Pitt-Hopkinssyndroom, en mij daarbij het ultieme voorbeeld gaf van hoe je professionaliteit en menselijkheid kan combineren naar zowel patiënten als medewerkers. Rachel Tros, mijn supervisor bij VUmc locatie Louwesweg, die mij als duizendpoot liet zien dat de combinatie van promoveren, klinisch werk als gynaecoloog, het managen van een ziekenhuislocatie en een gezin gewoon een optie is.

Dank aan de volgende mooie mensen in mijn leven die ook aan mijn zijde stonden tijdens dit promotietraject. Dank lieve vriendinnen. Lonneke, Elise, Maartje, Vibeke, Heleen, Levina, Willemijn. Margina, Djahill en Elise (wie had dat gedacht toen we begonnen aan onze stage Psychotrauma in het AMC!). Dank Hanna, wat ben ik blij dat ik je ken. Dank Ingelis. Dank studeer/werkmatties, Elise, Anna, Maartje, Philine, Mariëtte, wat ben ik gezegend dat ik op elke werkplek zo'n fijn maatje heb. Dank lieve familie, en schoonfamilie (schoonouders Willem en Marian) voor alle ondersteuning. Jullie aanwezigheid in mijn leven maakt elke dag een beetje mooier.

Dank Stefan, lieve broer, we delen onze liefde voor taal en ik kan geweldig met je lachen om woordgrappen, maar heb ook veel aan je gehad wanneer ik serieus naar teksten wilde kijken. Het was heel fijn om met je te sparren!

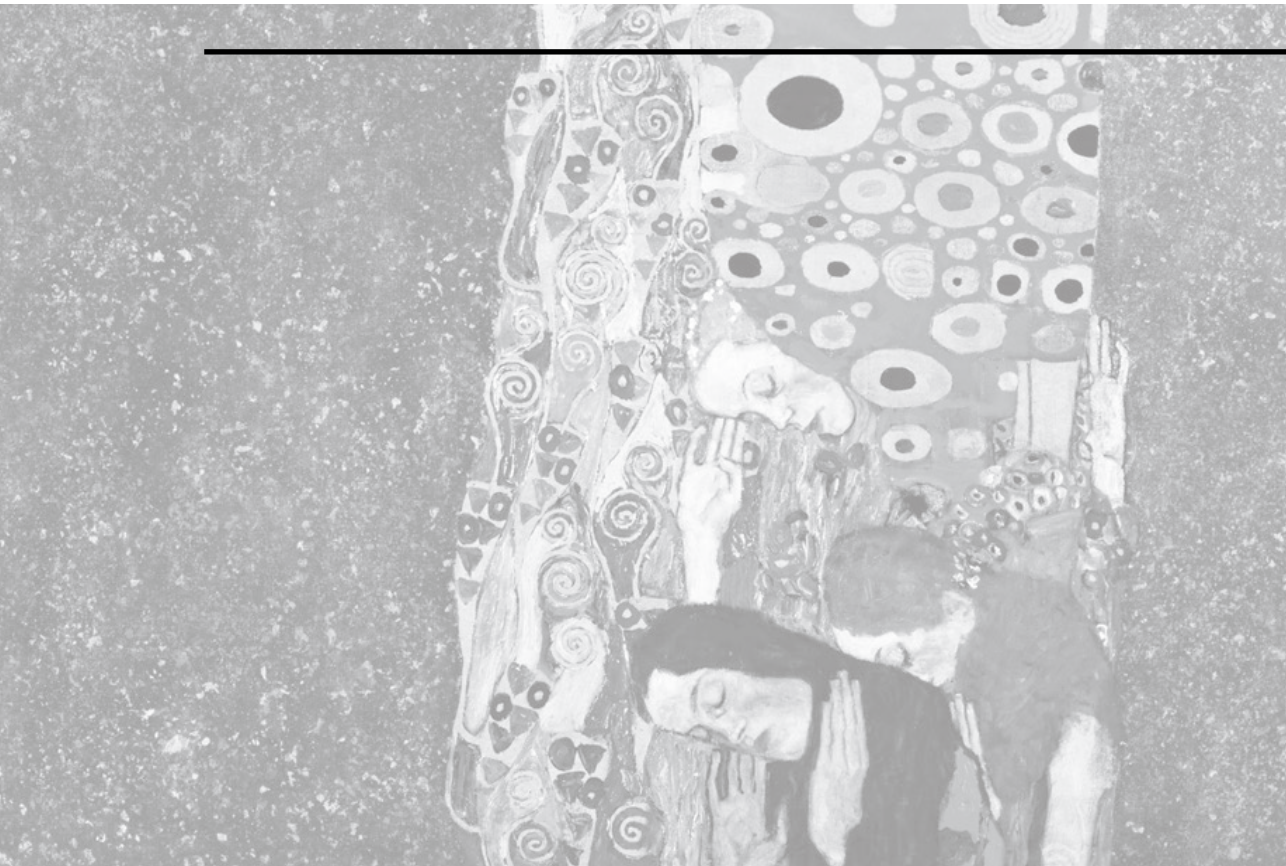
Dank, lieve Vincent. Je gezegde dat het uiteindelijk allemaal goedkomt is jouw levensmotto welke jij veelvuldig met mij deelde, en natuurlijk ook nu weer uitkwam. Dank, voor het accepteren van de onacceptabele werktijden, de ondersteuning waar nodig, en alle andere zaken op de lange lijst. Dank lieve zoon, David, voor je bestaan en de vreugde en geluk die je in mijn leven brengt.

Dank, lieve ouders. Ondanks de soms onnavolgbare levenswegen bij mij zijn jullie vol onvoorwaardelijke liefde en trots. Jullie hebben me meegegeven beide voeten op de grond te houden en hard te werken. Dank voor alle dingen die op zichzelf al een boekje zouden kunnen vullen.

Naast allen die genoemd zijn, ook dank aan alle anderen die ieder op hun eigen manier een bijdrage hebben geleverd aan het afronden van dit proefschrift.

APPENDIX D:

About the author



Melanie Baas was born as the third child of Maria Janmaat and Cock Baas on June 18th, 1987: a home birth in the little village De Hoef. After completing Gymnasium at the Alkwin Kollege in Uithoorn, she was not selected for studying medicine and began studying Psychology at the Vrije Universiteit in Amsterdam in 2005. She chose a master's degree in Clinical Psychology and completed her internship and master's thesis at the Psychotrauma subdivision of the Psychiatry department at the Academic Medical Center (AMC) in Amsterdam. There, her love for science emerged, and her thesis became her first scientific publication.

After completing her master's degree in Clinical Psychology, she was finally admitted to study Medicine at the AMC in 2010 on her last chance. During her bachelor of Medicine studies, she participated in the Honours Program, conducting a study project about breastfeeding at the obstetrics department under supervision of professor van der Post (AMC). Later in her studies, she conducted a global research project on the rare Pitt-Hopkins syndrome at the Department of Pediatrics (AMC) under the supervision of professor Hennekam. Throughout her studies, she felt an immediate affinity for the field of obstetrics and gynecology. She reached out to Mariëlle van Pampus (OLVG), who was a role model for research at the intersection of obstetrics and psychology. This ultimately became the beginning of her current PhD trajectory.

During her student years, she was actively involved in the Faculty Student Council for Psychology and Pedagogy. She was also active as a rower and coach at the rowing club A.A.S.R. Skøll, where she met her husband, Vincent Groen. In 2021, their son David was born.

From 2016 to 2020, Melanie worked as a Medical Doctor in Obstetrics and Gynecology at Tergooi, VU Medical Center (now: Amsterdam UMC) and Isala. In 2021, she began her residency as a gynecologist-in-training in cluster Groningen, first at the Martini Hospital and subsequently at the UMCG.

“I am particularly impressed with this manuscript's diligence in combining approaches to advance knowledge with direct relevance to practice.” (reviewer)

“Well-organized and well-written” (reviewer)

“It makes an important contribution to the literature” (reviewer)

Het proefschrift *‘Fear and PTSD in obstetrics: improving care for pregnant women and their healthcare providers’* biedt een wetenschappelijke basis voor meer inzicht in bevalangst (Fear of Childbirth; FoC) en posttraumatische stress-stoornis (PTSS) bij zwangeren, evenals de impact van werkgerelateerde ingrijpende gebeurtenissen op gynaecologen. Door het vergroten van de kennis op deze gebieden kan de zorg voor zwangere vrouwen en hun zorgverleners verbeterd worden.

Melanie Baas heeft als afgestudeerd psycholoog en gynaecoloog-in-opleiding een passie voor onderzoek op het snijvlak van psychologie en geneeskunde. Ze heeft als promovendus haar onderzoek verricht bij het OLVG, waar ze deel uitmaakte van de onderzoeksgroep Capture-Group. Ze omschrijft zichzelf als een geboren clinicus met passie voor wetenschappelijk onderzoek.

ISBN 978-94-6483-949-4

www.capture-group.nl