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ORIGINAL RESEARCH ARTICLE

Fear of childbirth in pregnancy was not increased during the COVID-19 pandemic in the Netherlands: a cross-sectional study

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Abstract

Introduction: Fear of childbirth is a well-known problem during pregnancy and can have implications for childbirth, including prolonged labor, use of epidural analgesia, obstetric complications, presence of traumatic stress symptoms, or request for an elective cesarean section. The coronavirus disease 2019 (COVID-19) pandemic has affected mental health and therefore could have increased fear of childbirth during the pandemic. The aim of this study was to investigate fear of childbirth during the pandemic in the Netherlands compared with a reference group from before the pandemic.

Material and methods: We conducted a cross-sectional study to evaluate pregnant women during the first and second waves of COVID-19 compared with both each other and with pregnant women from before the pandemic. Participants were recruited through social media platforms, hospitals, and midwifery practices. Pregnant women aged ≥18 years who had mastered the Dutch language were eligible to participate. Fear of childbirth was measured with the Wijma Delivery Expectancy Questionnaire online using a cut-off score of ≥85 to indicate clinically relevant fear of childbirth. The primary outcome was the prevalence of fear of childbirth. We undertook additional analyses to specifically look at possible effect modification.

Results: In total, 1102 pregnant women completed the questionnaire during the first wave of the pandemic, 731 during the second wave, and 364 before the pandemic. Fear of childbirth was present in 10.6%, 11.4%, and 18.4%, respectively. We considered possible effect modification, which indicated that age and parity had a significant influence. In participants during the first wave of COVID-19, nulliparous women had significantly lower odds (odds ratio [OR] 0.50; 95% confidence interval [CI] 0.34–0.73; $p < 0.01$) of having a fear of childbirth than did the reference group. Both younger participants in the first wave (OR 0.59; 95% CI 0.37–0.93; $p < 0.05$) and older participants

Abbreviations: CI, confidence intervalFoCfear of childbirth; HEAR, Request for HElp in fEAr of ChildbirthORodds ratio; W-DEQ A, Wijma Delivery Expectancy Questionnaire version A.

in the first wave (OR 0.44; 95% CI 0.28–0.71; $p < 0.01$) and the second wave (OR 0.36; 95% CI 0.21–0.62; $p < 0.01$) of COVID-19 had lower odds of fear of childbirth than the reference group.

Conclusions: Pregnant women during the first and second waves of COVID-19 had lower fear of childbirth scores than pregnant women before the pandemic, indicating less fear of childbirth during the pandemic. This could be explained by an increased level of information, more time to consume information, and better work–life balance with more people working at home during the pandemic.

KEYWORDS
anxiety, coronavirus, COVID-19, fear of childbirth, pregnancy, Sars-Cov-2

1 | INTRODUCTION

In early 2020, the World Health Organization declared coronavirus disease 2019 (COVID-19) to be a pandemic,[1] resulting in worldwide measures to prevent the virus from spreading, including border closures, quarantines, lockdowns, partial lockdowns, and travel restrictions.[2] These measures and restrictions affected mental health,[3] and several studies have found that the experience of pregnancy and delivery was also affected.[4,5] For example, one recent systematic review found a higher prevalence of both depression and anxiety in pregnant women during the COVID-19 pandemic (the pandemic), although heterogeneity was significant.[6] However, we found no such relationship in the Netherlands, with 20% of pregnant women having high levels of anxiety during the pandemic compared with 23% before the pandemic. Similar levels of depression were found in pregnant women during compared with before the pandemic (13% vs 15%, respectively).[7]

In addition to possible increases in anxiety and depression symptoms among pregnant women during the pandemic,[6] fear of childbirth (FoC) may also have risen, as mental health problems are a known predictor of FoC.[8] Although the definition of FoC varies, it covers a range of symptoms and feelings directly related to childbirth that interfere with normal occupational and domestic functioning, relationships, and social activities.[9] A systematic review showed an overall pooled prevalence of FoC of 14% in pregnant women before the pandemic.[10] Besides pre-existing mental health problems such as anxiety and depression, several other predictors have also been associated with FoC in general, including lack of social support, younger age, nulliparity, and obstetric complications during pregnancy or previous delivery.[11] However, other studies have contradicted some of these predictors, showing a higher prevalence of FoC in women with advanced maternal age[12] and in multiparous women.[8,10]

Overall, the pandemic could have had an influence on FoC and negative experiences of childbirth.

During the pandemic period specifically, Taubman-Ben-Ari et al.[13] found that, in pregnant women in Israel, fear of being infected by COVID-19 was significantly related to higher FoC. Background characteristics including poorer health, an at-risk pregnancy, and being primiparous were significant contributors to higher rates of FoC. A recent study by Mayopoulos et al.[14] in America found that women giving birth during the pandemic reported a significantly higher stress response to childbirth than those who gave birth before the pandemic, as measured by the Peritraumatic Distress Inventory, which assesses negative emotional responses during or immediately after a specified trauma. FoC and peritraumatic distress are not the same; however, FoC is a potential risk factor for peritraumatic distress. Another study during the same research period found that women who tested positive for COVID-19 and therefore had no visitors because of restrictions, reported significantly more pain during the delivery and a higher prevalence of acute stress responses at a clinical level during birth.[15] FoC is a potential predictor of labor pain intensity.[16] The factors in these studies suggest that it is possible that FoC has also increased during the pandemic.

Key message

Fear of childbirth does not appear to have increased during the COVID-19 pandemic in the Netherlands.

However, thus far, only studies mainly focusing on stress responses during labor have been published. None of these have used the widely validated Wijma Delivery Expectancy Questionnaire version A (W-DEQ A), which is mostly used to measure FoC worldwide.[17]

Since the impact of the pandemic on the prevalence of FoC remains unclear, this study aims to give an overview of the prevalence of FoC in pregnant women during the first and second waves of COVID-19 compared with a control group from before the pandemic.

2 | MATERIAL AND METHODS

In this cross-sectional cohort study, pregnant women during the first and second waves of the pandemic (participants) were compared with pregnant women from before the pandemic (reference group).

During the first wave, from March 2020 to June 2020, pregnant women in the Netherlands were invited through a social media campaign from May 21 to June 22, 2020. The campaign was launched using social media platforms such as Facebook, LinkedIn, and Instagram and was aimed at women with special interest in pregnancy-related topics (such as obstetric care and midwifery). Interest- and region-focused algorithms were used to attract potential participants using advertisements and social sharing, which led to a total target audience of 300,000 women. Furthermore, flyers with information about the survey were distributed in prenatal clinics and hospitals across Amsterdam.

After participants submitted informed consent online, they were provided access to a questionnaire via a secure online platform.

During the second wave of the pandemic, from September 2020 to January 2021, the social media campaign was launched again to recruit a new group of pregnant women. From November 25 to December 11, 2020, women were invited through Facebook and Instagram.

Inclusion criteria were pregnant women in the Netherlands. Exclusion criteria were age <18 years and insufficient mastery of the Dutch language.

The survey consisted of two parts: a demographic questionnaire and a validated self-reporting questionnaire. The demographic questionnaire included maternal age, parity, estimated day of delivery, previous treatment for psychological problems, country of birth, and risk area for COVID-19. We used the estimated day of delivery and the day of completing the questionnaires to calculate the gestational age and trimester at the time of the questionnaire. Trimesters were defined as follows: first trimester ≤12 weeks, second trimester from 13 to 27 weeks' gestational age, and third trimester from 28 weeks' gestational age until delivery. Risk areas for COVID-19 were defined according to statistics from the National Institute for Public Health and Environment, with high risk defined as a mean of >100 new cases a day and low risk as <100 new cases a day in a state between March 27 and April 16, 2020, and for the second wave of the pandemic around December 1, 2020.[18]

We used the W-DEQ A to measure FoC. This questionnaire contains 33 items on a six-point Likert scale from 0 to 5. Total scores range from 0 to 165. A total score of ≥85 indicates a clinically relevant level of FoC.[17,19] The W-DEQ has good psychometric properties with Cronbach's alpha of 0.86 and a composite reliability index of 0.93.

We used data from the HEAR (Request for HElp in fEAr of Childbirth) study (Medical Research Ethics Committee: W18.188) as a reference group. This reference group consisted of 364 women who filled out the W-DEQ A before the pandemic, between February 2019 and January 2020. The main aim of this study was to determine the course of FoC according to gestational age in nulliparous women. Women were recruited through online media, OLVG hospital in Amsterdam, and several midwifery practices in Amsterdam, the Netherlands. An online link provided detailed information about the study. Participants provided informed consent by providing their email address and then received a personal link to the online questionnaire via a secure platform. Exclusion criteria were age <18 years, insufficient command/mastery of the Dutch language, and multiparity (defined as a previous gestation of >16 weeks). The results of this study were unpublished at the time of our study.

2.1 | Statistical analyses

We summarized the demographic features of the three cohorts using descriptive statistics. Before we conducted the inferential analysis, we used descriptive statistics to test the assumptions. Where parametric assumptions were not met, we used nonparametric equivalents. We compared possible differences in demographic variables between groups using the independent *t*-test or the Mann–Whitney *U* test for continuous variables and the chi-squared (χ^2) test for categorical variables.

To compare the three groups according to total W-DEQ A score, we performed a Kruskal–Wallis test. We performed post-hoc Mann–Whitney *U* tests to determine potential differences between the separate groups. Additionally, we used the χ^2 test to determine differences in FoC (W-DEQ A ≥85) between the groups.

Furthermore, to test for effect modification, we conducted univariable logistic regression analyses and reported odds ratios (ORs) with 95% confidence intervals (CIs). Age (dichotomized into younger and older groups with a cut-off at the median of 32 years), parity, gestation, and previous treatment for psychological problems were tested as potential effect modifiers by including interaction terms in the univariable analyses. *p*-Values for interaction <0.01 were considered statistically significant, and analyses were stratified accordingly.

A $p<0.05$ was considered statistically significant. Medians (interquartile range [IQR]) are presented). Data were analyzed using SPSS Statistics (version 26.0).[20]

2.2 | Ethical Approval

The research protocol was approved by the accredited Medical Research Ethics Committee of the Amsterdam UMC on May 18, 2020 (reference Medical Research Ethics Committee 2020.260).

3 | RESULTS

The social media campaign launched during the first and second waves of the pandemic resulted in a total of 1833 pregnant women completing the questionnaires: 1102 during the first wave and 731 during the second wave.

Background characteristics are shown in Table 1. Participants during the pandemic (first and second waves) differed from those in the reference group in age, parity, gestational age, and history of

TABLE 1 Demographics and characteristics of participants (during the first and second waves of COVID-19) and reference group (before the COVID-19 pandemic)

	Participants first wave $n = 1102$	Participants second wave $n = 731$	Reference group $n = 364$	Participants first wave vs reference group, p- value	Participants second wave vs reference group, p-value	Participants first vs second wave, p-value
Age (years)	32 (29.0–34.0)	31 (29.0–34.0)	30 (28.0–33.0)	<0.01	0.01	<0.01
Parity Nulliparity Multiparity	527 (47.8) 575 (52.2)	326 (44.6) 405 (55.4)	364 (100) 0 (0)	<0.01	<0.01	0.17
Gestation First trimester Second trimester Third trimester	213 (19.3) 399 (36.2) 490 (44.5)	102 (14.0) 355 (48.6) 274 (37.5)	47 (12.9) 137 (37.6) 180 (49.5)	0.02	<0.01	0.00
Previous treatment for psychological problems (before) Yes No	428 (38.8) 674 (61.2)	254 (34.7) 477 (65.3)	174 (47.8) 190 (52.5)	0.00	<0.01	0.08
Country of birth Netherlands Other	1051 (95.4) 51 (4.6)	700 (95.8) 31 (4.2)	343 (94.2) 21 (5.8)	0.38	0.26	0.69
Living area High-risk COVID-19 Low-risk COVID-19 Unknown	752 (68.2) 348 (31.6) 2 (0.2)	63 (8.6) 668 (91.4)		n/a	n/a	<0.01

Note: Data are presented as n (%) or median (interquartile range) unless otherwise indicated. n/a, not applicable.

psychological distress. The participants during the first wave were older than those during the second wave. Gestation also differed: the majority of participants during the first wave were in their third trimester, and the participants during the second wave were mainly in their second trimester. A higher percentage of participants during the second wave lived in a high-risk COVID-19 area.

The overall W-DEQ A score was statistically significantly different between the participants during the first wave, the second wave, and the reference group ($p < 0.01$). Post-hoc tests revealed that all three groups differed significantly (first wave vs reference group, $p < 0.01$; second wave vs reference group, $p < 0.01$; first wave vs second wave, $p = 0.03$).

Furthermore, the prevalence of FoC (W-DEQ A ≥85) also differed across groups; χ^2 (2, $N = 2197$) = 16.21, $p < 0.01$. The prevalence of FoC was significantly lower in participants during both the first and the second wave than in the reference group ($p < 0.01$). There was no statistically significant difference between participants during the first and second waves ($p = 0.62$) (Table 2).

Trimester and previous treatment for psychological problems were not significant effect modifiers (p for interaction ≥0.13). Age and parity showed significant effect modification (p for interaction ≤0.03 and <0.01, respectively). Therefore, we conducted regression analyses for these factors, as shown in Table 3. Nulliparous women during the first wave of COVID-19 had significantly lower odds for FoC than those in the reference group. Both younger participants in the first wave and older participants in the first and second waves of COVID-19 had lower odds for FoC than those in the reference group.

4 | DISCUSSION

The overall W-DEQ A score and W-DEQ A ≥85 (indicating FoC) were statistically significantly lower among participants during both the first and the second wave than among those in the reference group.

Stratification analyses to look for possible effect modification indicated that age and parity were significant effect modifiers; when taking these factors into account, subgroup analyses showed that FoC scores remained statistically significantly lower during the pandemic than in the reference group from before the pandemic.

In the current study, FoC scores were lower during the first and second waves of the pandemic than in the reference group. A European study in six different countries, including 6422 pregnant women, found a prevalence of 11.3% in primiparous women and 10.9% in multiparous women, which is lower than the prevalence rate of the reference group (18.6%); prevalence rates of FoC in the current study during the pandemic (10.6% and 11.4%) are in line with these findings.[21]

Another possible partial explanation for the lower FoC scores during the first and second waves of the pandemic compared with the reference group might be that women had lower stress levels and less pressure in daily life and working life. As such, it is conceivable that working from home might have resulted in less physically demanding work, less work-related stress, optimization of sleep duration, better uptake of exercise, and increased social support. These factors are also possible explanations for the reduced risk of preterm birth during the pandemic.[22,23] All of the influencing factors

TABLE 2 Wijma Delivery Expectancy Questionnaire version A (W-DEQ A) scores.

	Participants first wave *N* = 1102	Participants second wave *N* = 731	Reference group *N* = 364
Total W-DEQ A score, median (IQR)	60.0 (45.0–75.0)	57.0 (41.0–73.0)	66.0 (51.0–80.0)
W-DEQ A ≥85, *n* (%)	117 (10.6)	83 (11.4)	67 (18.4)

Abbreviation: IQR, interquartile range.

TABLE 3 Association between the three groups and fear of childbirth in the total population and stratified for effect modifier

	Total population	Nulliparity (*N* = 1217)	Multiparity (*N* = 980)	Age (≤31 years) (*N* = 1112)	Age (≥32 years) (*N* = 1085)
Reference group	Ref	Ref	NA	Ref	Ref
Participants first wave	0.53 (0.38–0.73)**	0.50 (0.34–0.73)**	Ref	0.59 (0.37–0.93)*	0.44 (0.28–0.71)**
Participants second wave	0.57 (0.40–0.81) *	0.78 (0.52–1.17)	0.73 (0.47–1.13)	0.80 (0.50–1.28)	0.36 (0.21–0.62)**

Note: Data are presented as odds ratio (95% confidence interval).

*$p < 0.05$; **$p < 0.01$.

could contribute to increased mental well-being and thus also result in less FoC. Another explanation for less fear is the more detailed information that was available for pregnant women in the pandemic about pregnancy and delivery.

Thus far, only a few studies have focused specifically on FoC and childbirth-related anxiety and stress during the pandemic, although none of these studies used the W-DEQ A to determine the presence of FoC. This makes it difficult to compare results.

However, Taubman-Ben-Ari et al.[13] (*N* = 403) found that higher levels of COVID-19-related fears were associated with higher childbirth anxiety during the pandemic. Mayopoulos et al.[14] (*N* = 2251) compared women around 2 months postpartum who were pregnant during the pandemic and postpartum women who were pregnant before the pandemic and found higher acute stress related to childbirth during the pandemic.[14] As such, it is plausible that FoC might also be increased during the pandemic; however, our study did not find this.

When interpreting these data, several strengths and limitations need to be considered. One strength is the large cohort, consisting of two groups of pregnant women who participated during the first wave (*n*=1102) and the second wave (*n*=731) of the pandemic in the Netherlands. Because the measurements took place at two different stages in the pandemic, this gives insight during a longer period of time during the pandemic. Another strength is the comparison with pregnant women who completed the same questionnaire before the pandemic, allowing us to study the influence of the pandemic on FoC.

A limitation of this study is the selection bias resulting from the recruitment of participants through social media. An additional limitation is the difference in demographic characteristics between the participant groups during the pandemic and the reference group initially recruited for the HEAR study. However, after taking these differences into account, FoC during the pandemic remained visibly lower. Also, the reference group consisted of only nulliparous women, which several studies have found to be a risk factor for FoC. Therefore, the prevalence of FoC in the reference group may be higher than expected in the general pregnant population, which might explain the difference in FoC rates during the pandemic and the reference group instead of reflecting the influence of the pandemic on FoC.

In addition, the preventive measures and actions taken to prevent the spread of COVID-19 differed between countries, making the generalizability of this study outside of the Netherlands difficult. Another limitation is the timing of the data collection of the participant group during the first wave of COVID-19. This was at the end of the first wave, and hospital restrictions may have already been lifted and physical pre-natal checkups might have started again in some cases. However, the participants during the second wave of COVID-19 were recruited at the height of the second wave, and no difference was found for the prevalence of FoC during the pandemic.

5 | CONCLUSION

During the first and second waves of COVID-19, we found no indication for increased FoC in the Netherlands. The level and presence of FoC was statistically significantly lower during the pandemic than in the reference group from before the pandemic, including after stratification for effect modification. Even so, more than one in ten pregnant women still had FoC. It remains important to screen for signs of FoC during pre-natal checkups as it can negatively impact birth experiences and postpartum mental health. More studies are necessary to research the prevalence and possible influencing factors of FoC during the COVID-19 pandemic.

AUTHORS CONTRIBUTION

BFPB, RAdL, MGvP, and CJMdG contributed to the design of the study. RAdL built the online questionnaire. SJMZ, BFPB, RAdL, MGvP, and CJMdG reviewed the questionnaires that were included for this study. SJMZ, BFPB, RAdL, YMGAH, MGvP, and CJMdG helped raise awareness for the study through online content. YMGAH contributed with the data from the control group and analysis. SJMZ, YMGAH, and MGvP analyzed and interpreted the data. SJMZ, MGvP, and YMGAH drafted the manuscript. All authors reviewed the manuscript. All authors saw and approved the final version.

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CONFLICT OF INTEREST

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