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Mental health problems and fear of childbirth: A cohort study of women in an inner-city maternity service

Selina Nath PhD[1] | **Lucy N. Lewis MBBS**[1] | **Debra Bick PhD**[2] | **Jill Demilew MSc**[3] | **Louise M. Howard PhD**[1]

[1]Health Service and Population Research Department, Section of Women's Mental Health, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK

[2]Warwick Clinical Trials Unit, Warwick Medical School, University of Warwick, Coventry, UK

[3]Women's Health, King's College Hospital NHS Foundation Trust, London, UK

Correspondence
Selina Nath, PhD, Health Service and Population Research Department, Section of Women's Mental Health, Institute of Psychiatry, Psychology and Neuroscience, King's College London, De Crespigny Park, London SE5 8AF, UK.
Email: selina.nath@kcl.ac.uk

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Abstract

Objectives: To estimate the population prevalence of severe fear of childbirth (FOC) during pregnancy and investigate its association with: (a) antenatal common mental disorders (depression and anxiety disorder) and (b) elective cesarean birth.

Methods: 545 participants from an inner-city London maternity population were interviewed soon after their first antenatal appointment (mean gestation: 14 weeks). Current mental disorders were assessed using the Structured Clinical Interview DSM-IV. FOC was measured using the Wijma Delivery Expectancy/Experience Questionnaire (WDEQ-A) at approximately 28 weeks gestation (n = 377), with severe FOC defined using a cutoff of WDEQ-A ≥ 85. Birth mode information was collected at 3 months post-delivery using an adapted Adult Service Use Schedule. Linear regressions were used to model associations, adjusting for the effects of covariates (age, parity, relationship status, education, and planned pregnancy). Sampling weights were used to adjust for bias introduced by the stratified sampling. We also accounted for missing data within the analysis.

Results: The estimated population prevalence of severe FOC was 3% (95% CI: 2%-6%) (n = 377). Depression and anxiety were significantly associated with severe FOC after adjustment for covariates (45% vs 11%; coefficient: 15.75, 95% CI: 8.08-23.42, $P < .001$). There was a weak association between severe FOC and elective cesarean birth.

Conclusions: Severe FOC occurs in around 3% of the population. Depression and anxiety are associated with FOC. Pregnant people with depression and anxiety may be at increased risk of experiencing severe FOC. Attitudes toward childbirth should be assessed as part of routine clinical assessment of pregnant people in contact with mental health services.

Selina Nath and Lucy N. Lewis: Joint first author.

KEYWORDS
anxiety, depression, fear of childbirth, mental disorders, pregnancy

1 | INTRODUCTION

Fear of childbirth (FOC) has been broadly described as a spectrum of anxious thoughts and feelings relating to a women's[1] appraisal of labor and birth.[1-3] Although some apprehension about childbirth may be considered normal, especially for first-time mothers[1] or mothers with prior negative childbirth experiences, some women can experience clinically significant severe FOC.[4,5] Severe FOC is an intense fear that affects a women's day-to-day functioning, consequently affecting her personal, social, and work life. On the far end of the spectrum exists tokophobia, representing more profound pathological fears, which fulfill the criteria for a specific phobia.[6,7] This differs from women with low-to-moderate fears, who understand that their fears surrounding birth are as expected.[3]

Estimates of severe FOC vary widely across studies worldwide ranging between 6% and 30%.[2,8,9] A systematic review and meta-analysis reported a pooled prevalence of 14% (95% CI: 12%-16%).[10] These prevalence estimates were derived from countries including Australia, Canada, The Netherlands, Switzerland, the United States, Norway, Sweden, Denmark, Croatia, Belgium, Iceland, Finland, Italy, Estonia, Turkey, China, South India, Iran, and Japan.[2,8-10] Methods of measuring severe FOC include questionnaires, face to-face interviews, and ICD classifications.[2] The Wijma Delivery Expectancy/Experience Questionnaire has been the most widely used method to measure FOC, with a cutoff of ≥85 indicating severe FOC. This tool has been found to be consistent in measuring levels of severe FOC.[2] In the United Kingdom, there has been no prevalence estimate for severe FOC and there is no clear treatment pathway for women experiencing FOC. Despite national guidance stating that women with "childbirth anxieties" should be offered a specialist referral,[11,12] only about half of maternity units provide a specialist service.[13]

Maternal common mental disorders (depression and anxiety disorder) may increase the risk of severe FOC.[14-17] A retrospective Finnish study of 2405 women found that women with higher FOC were more likely to have a history of psychiatric care.[15] Several other studies have found similar associations,[5,14,16-22] but detection for common mental disorders has been primarily measured with either screening questions (eg, Edinburgh Postnatal Depression Scale (EPDS)) or review of national/hospital registry administrative data. This study was designed to add to the literature on FOC by using a gold standard diagnostic measure of common mental disorders (depression and anxiety).

Anxieties and fears surrounding childbirth may also be contributing to increasing cesarean birth (CB) rates in the United Kingdom by means of nonmedical requests for cesareans.[13,23] The UK National Institute for Health and Care Excellence (NICE) guidelines endorse offering planned CB for women with "childbirth anxiety" if prior support with a perinatal mental health specialist was not effective.[11] Several studies have reported an association between FOC and increased requests for and/or of actual rates of CB.[17,18,24-26] However, to date, the only study in the United Kingdom found no association between FOC and mode of birth.[27]

Our objective was to estimate the prevalence of severe FOC during pregnancy and to investigate: (a) the potential associations between common mental disorders (depression and anxiety, diagnosed using a gold standard clinical interview) and severe FOC; and (b) whether severe FOC predicts elective CB rates. To our knowledge, this is the first reporting of FOC prevalence and its associated mental disorder correlates in a United Kingdom cohort using a representative sample.

2 | METHODS

2.1 | Study design and participants

The WEll-being in pregNancy stuDY (WENDY) recruited participants during early pregnancy from an inner-city maternity service in South-East London. The primary aim of the WENDY baseline study was to investigate the prevalence of mental disorders in early pregnancy and the diagnostic accuracy of depression screening (Whooley) questions.[28,29] For this reason, a stratified sampling design was used for the baseline recruitment according to participants answering positive or negative on the two depression questions routinely asked by midwives during the first antenatal booking appointment (Whooley questions: "During the past month have you often been bothered by feeling down, depressed, or hopeless?"; "During the past month have you often been bothered by having little interest or pleasure in doing things?"). Full details of the baseline recruitment are published elsewhere.[28] Briefly, all women who were Whooley-positive (W+) and a random sample of Whooley negatives (W−) were approached to take part in the study. Exclusion criteria included women who: were aged <16, lacked mental capacity to provide informed consent, declined answering the Whooley questions, had already undergone a comprehensive maternity booking elsewhere in the United Kingdom, and experienced a termination

or miscarriage between booking and the baseline interview. Interpreters were arranged for non–English-speaking participants.

Eligible pregnant participants were recruited into the study at approximately 10-12 weeks' gestation within a maximum of 3 weeks from the first antenatal booking appointment. The baseline interview was conducted by trained postgraduate research midwives and researchers, which included a gold standard diagnostic interview, and questions about women's sociodemographic and obstetric history (n = 545, mean pregnancy gestation: 14 weeks at the research interview). Participants were followed up at mid-pregnancy (mean pregnancy gestation: 29 weeks) and approximately 3 months postpartum. At both follow-up interviews, participants completed questionnaires and an interview on service use (including labor and birth details).

2.2 | Research measures

2.2.1 | Common mental health disorders (depression and anxiety)

The Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (4th ed; DSM-IV) Axis I Disorders was administered at the baseline interview (SCID, research version) during early pregnancy[30] to establish diagnostic groups of participants with "depression" and "anxiety disorders". The SCID is a semi-structured diagnostic interview, consisting of standardized questions, which correspond to each DSM-IV Axis I disorder. For the current analysis, participants were categorized as having depression if they met diagnostic criteria for depressive disorder, major depressive episode, or mixed depression and anxiety. Anxiety disorders included panic disorder, social phobia, obsessive-compulsive disorder, generalized anxiety disorder, and agoraphobia. Common mental disorders included all those that met criteria for either depression or anxiety. Some of these participants could have met criteria for both depression and anxiety disorder.

2.2.2 | Fear of childbirth

At the mid-pregnancy follow-up (around 28 weeks' gestation), the Wijma Delivery Expectancy/Experience Questionnaire (WDEQ-A) was administered to assess FOC. This is the most widely used and validated measure for FOC, consisting of 33 self-completed questions specifically designed to measure fear of labor and birth based on women's cognitive and emotional expectations.[2,10,31] It consists of six sections including the following: (1) "How do you think your labour and delivery will turn out as a whole?"; (2) "How do you think you will feel in general during the labour and delivery?"; (3) "How do you think you will feel during the labour and delivery?"; (4) "What do you think will happen when labour is most intense?"; (5) "How do you imagine it will feel the very moment you deliver the baby?"; and (6) "Have you, during the last month, had fantasies about the labour and delivery?". Each item within the sections has options ranked on a 6-point Likert scale to indicate opposite extremes of an expected experience (eg, 0 = "extremely strong" to 5 = "not at all strong" or 0 = "confident" to 5 = "not at all confident"). Summing all the items together gives a continuous score ranging between 0 and 165, with higher scores reflecting more severe fears. Severe FOC was defined using a cut-off score on WDEQ-A of 85 or above, in line with previous research.[9,16,25,26,31-33]

2.2.3 | Delivery mode

At the 3-month postnatal follow-up, participants were asked how they gave birth (spontaneous vaginal, assisted vaginal, emergency cesarean, elective cesarean) as a part of a service use interview, using an adapted version of the Adult Service Use Schedule (AD-SUS).[34,35] The AD-SUS is a researcher administrated interview conducted with participants to collect information on service use and delivery information. This tool was specifically modified for the current study to include services relevant to the perinatal period.

2.2.4 | Confounders

Socio-demographics and obstetric information were collected at the baseline interview using a self-reported questionnaire (age, parity, relationship status, education, and planned pregnancy). All confounders were chosen a priori according to previous research.[9,14,18,19,36-39]

2.3 | Patient involvement

The development of the WENDY study, research measures, grant application, and study protocol were informed by our patient and caregiver advisory group. The patient advisory group included people with a range of mental disorders who were interested in our study program. Regular meetings were held to discuss the WENDY study and other related studies within the NIHR-funded program.

2.4 | Statistical analyses

All analyses were conducted using STATA.v15.[40] Before conducting analyses, the outcome variable (WDEQ-A total

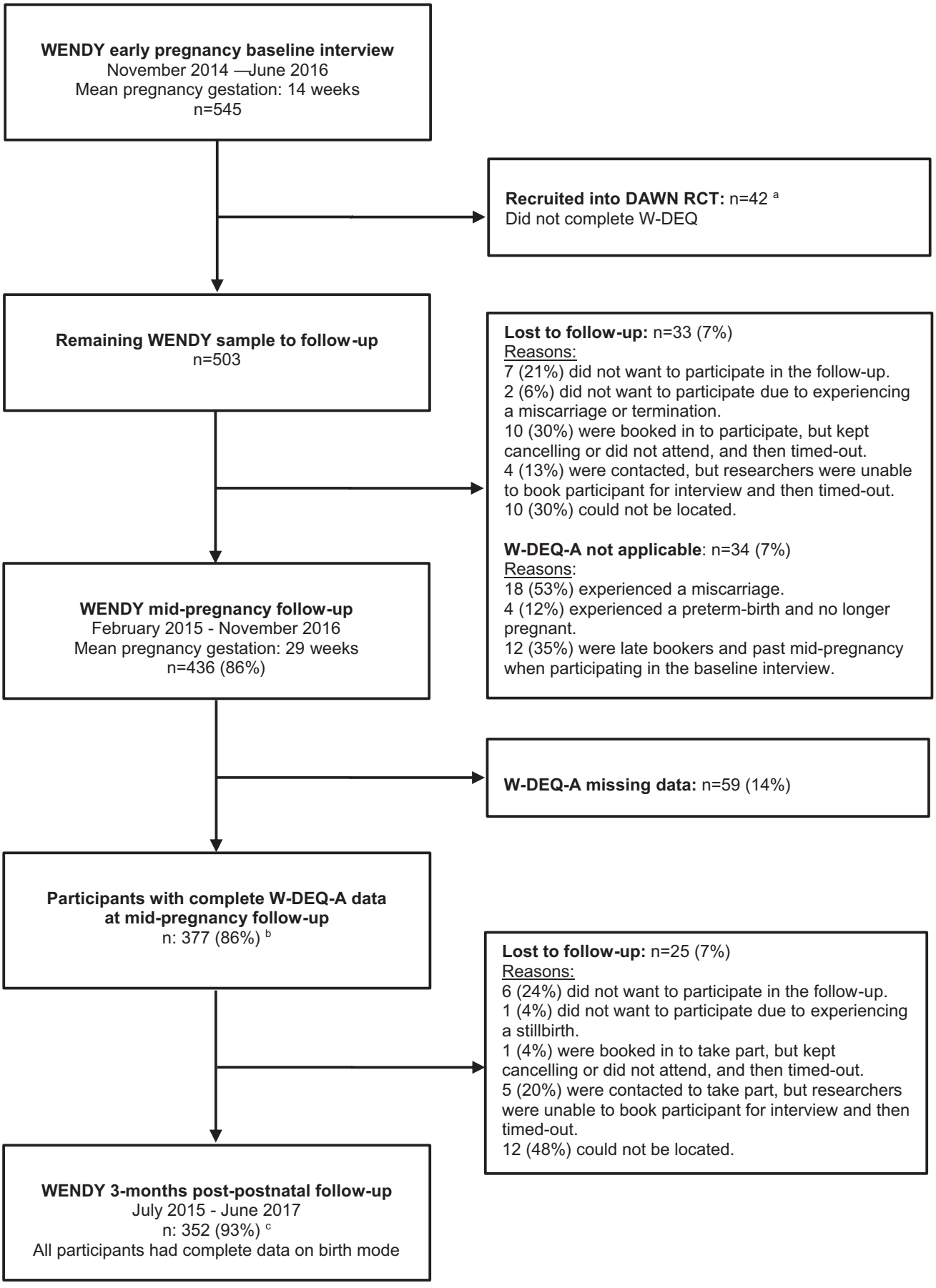

FIGURE 1 Flowchart of WENDY study follow-up and sample sizes for statistical analysis

TABLE 1 Mental disorders, socioeconomic characteristics, and delivery mode of women with high and low fear of childbirth (unweighted)

	Low FOC W-DEQ-A < 85 (n = 346)[a]	Severe FOC W-DEQ-A ≥ 85 (n = 31)[b]	*P*-value	Total (n = 377)[c]
Fear of childbirth continuous W-DEQ-A:	Mean: 48.55 SD: 18.98	Mean: 96.32 SD: 10.06		Mean: 52.47 SD: 22.61
Mental disorders				
Depression			<.001	
No	293 (85%)	15 (48%)		309 (81%)
Yes	53 (15%)	16 (52%)		69 (69%)
Anxiety			.004	
No	300 (87%)	21 (68%)		321 (85%)
Yes	46 (13%)	10 (32%)		56 (15%)
Common mental disorders			<.001	
No	265 (77%)	12 (39%)		277 (73%)
Yes	81 (23%)	19 (61%)		100 (27%)
Sociodemographic characteristics				
Age (y)	Mean: 32.7 Range:18-46	Mean: 33.3 Range:22-45	.560	Mean: 32.8 Range:18-46
Ethnicity			.838	
White	191 (55%)	21 (68%)		212 (56.2%)
Black/Caribbean	100 (29%)	7 (23%)		107 (28.4%)
Asian/Asian British	14 (4%)	1 (3%)		15 (4.0%)
Mixed/Multiple ethnicity	15 (4%)	1 (3%)		16 (4.2%)
Other	26 (8%)	1 (3%)		27 (7.2%)
Highest Education level			.711	
None/school qualifications College level	158 (46%)	13 (42%)		171 (45%)
Degree level/Postgraduate qualifications	188 (54%)	18 (58%)		206 (55%)
Employment status			.973	
Employed	225 (65%)	22 (71%)		247 (66%)
Student	11 (3%)	1 (3%)		12 (3%)
Unemployed	40 (12%)	3 (10%)		43 (11%)
Homemaker	48 (14%)	3 (10%)		51 (14%)
Not working due to illness/other	21 (6%)	2 (6%)		23 (6%)
Income			.491	
<£15 000	35 (13%)	7 (24%)		42 (14%)
£15 000-£30 999	47 (18%)	3 (10%)		50 (17%)
£31 000-£45 999	37 (14%)	5 (17%)		42 (14%)
£46 000-£60 999	45 (17%)	4 (14%)		49 (17%)
£61 000 or more	103 (39%)	10 (34%)		113 (38%)
Relationship status			.151	
Married/cohabiting	273 (91%)	21 (77%)		340 (90%)
Single/not cohabiting	73 (9%)	10 (23%)		37 (10%)
Multiparous			.137	
No	175 (51%)	20 (65%)		195 (52%)
Yes	171 (49%)	11 (35%)		182 (48%)

(Continues)

TABLE 1 (Continued)

	Low FOC W-DEQ-A < 85 (n = 346)[a]	Severe FOC W-DEQ-A ≥ 85 (n = 31)[b]	*P*-value	Total (n = 377)[c]
Planned pregnancy			.024	
Planned	246 (71%)	16 (52%)		262 (70%)
Not planned	100 (29%)	15 (48%)		15 (30%)
Immigration status			.915	
Secure	299 (86%)	27 (87%)		326 (86%)
Insecure	47 (14%)	4 (13%)		51 (14%)
Translator required			1.00	
No	322 (93%)	29 (94%)		
Yes	24 (7%)	2 (6%)		26 (7%)
Delivery mode (n = 352)[d]				
Type of delivery			.326	
Spontaneous vaginal	194 (60%)	14 (50%)		208 (59%)
Assisted vaginal	51 (16%)	4 (14%)		55 (16%)
Emergency Caesarean	46 (14%)	4 (14%)		50 (14%)
Elective Caesarean	33 (10%)	6 (21%)		39 (11%)

(n) Indicates the number of study participants.

[a]Of those that reported low FOC (W-DEQ-A < 85) 146 were W+ and 200 were W−.

[b]Of those that reported severe FOC (W-DEQ-A ≥ 85) 25 were W+ and 6 were W−.

[c]1 missing employment, 81 missing yearly income.

score) was checked for normality by inspecting the distribution visually and with statistical tests of normality by investigating skewness and kurtosis in STATA. The outcome variable was normally distributed. The internal reliability of the scale was also high (Cronbach's α = 0.92).

The prevalence of severe FOC (WDEQ-A ≥ 85) was estimated using sampling weights to account for bias introduced by the stratified sampling—a standard method used to account for stratified sampling as described by Pickles et al (1995).[41] Sampling weights were established using the number of W+ and W− participants in the WENDY study sample (n = 545; includes 287 W+ and 258 W−) and all those who had a maternity appointment booking at the maternity unit during the study period (the study population n = 9963; includes 906 W+ and 9057 W−). Therefore, the weights applied were 906/287 for W+ and 9057/258 for W− (see Howard et al, 2018, for full details of sampling weights[28]).

Differences in socio-demographics and mental disorders between participants with severe FOC (WDEQ-A ≥ 85) and participants with low fear (WDEQ-A < 85) were investigated using the chi-squared tests/Fisher exact or *t* test where relevant. To investigate the association between maternal mental disorders (exposures depression, anxiety, and common mental disorders) and the outcome FOC, separate linear regressions were run with continuous outcome WDEQ-A total scores. Adjusted linear regression models were then run adjusting for covariates selected a priori based on previous literature (age, parity, relationship status, education, and planned pregnancy).[9,14,18,19,37-39] Age was treated as a continuous variable in years calculated from maternal date of birth and date of interview, maternal education level was categorized as none/school/college level vs degree level/postgraduate qualifications, relationship status was categorized into married/cohabiting and single/not cohabiting, planned pregnancy responses were categorized as planned or not planned, and multiparous was divided in to a yes/no response. Logistic regression was used to investigate the association between exposure FOC and binary outcome elective CB. As a result of small sample sizes in the birth mode analysis, further multivariate analysis was not conducted.

2.4.1 | Missing data

The baseline WENDY cohort included 545 pregnant participants. However, 42 participants were recruited into another study (DAWN) before their midpregnancy follow-up interview and were not administered the WDEQ-A questionnaire.[42,43] See Figure 1 for flowchart of participants through the study and details on sample sizes for the current analysis. Inverse probability weights were used to account for variables that predicted missingness on the WDEQ-A (because

of attrition and missing data). Participants with missing WDEQ-A data were more likely to be older (coefficient: 0.04, 95% CI: 0.00-0.07, $P = .036$) and of single relationship status (coefficient: 1.08, 95% CI: 0.67-1.50, $P < .000$).

3 | RESULTS

3.1 | Sample characteristics

The WENDY study sample (n = 545) was broadly similar to the base study population for age, ethnicity, and number of children.[28] Characteristics of the wider base population and study sample for the current analysis (n = 377) are included in Table S1. Table 1 presents unweighted sociodemographic characteristics and mode of birth of women with and without severe FOC (n = 377). Compared with women reporting low FOC (defined as WDEQ-A < 85), women with severe FOC (WDEQ-A ≥ 85) were more likely to have an unplanned pregnancy.

3.2 | Prevalence

Using weighted estimates, the population prevalence of severe FOC (WDEQ-A ≥ 85) was estimated as 3% (95% CI: 2%-6%). Of the women with severe FOC, 35% (95% CI: 13%-66%) were multiparous and 65% (95% CI: 34%-87%) were nulliparous. Table 1 presents unweighted percentages of common mental disorders of women with and without severe FOC. After adjusting for weights, SCID depression was estimated to occur in 27% (95% CI: 10%-56%) of women with severe FOC and 4% (95% CI: 2%-6%) of women with low FOC. Any anxiety disorder was estimated to occur in 24% (95% CI: 7%-58%) of women with severe FOC and 8% (95% CI: 5%-12%) of women with low FOC. Common mental disorders were estimated to occur in 45% (95% CI: 19%-73%) of women with severe FOC and 11% (95% CI: 8%-16%) of women with low FOC.

3.3 | Associations between common mental disorders and fear of childbirth (WDEQ-A score)

Unadjusted linear regressions showed that depression, anxiety disorder, and common mental disorders (CMD) were all significantly associated with higher fear of childbirth (higher WDEQ-A total scores) (see Table 2). All associations remained, even after adjusting for maternal age, education level, relationship status, parity, and unplanned pregnancy. For all final adjusted models including all covariates, see Table 3.

3.4 | Associations between FOC and mode of birth

Mode of birth in women with low FOC (defined as WDEQ-A < 85), compared with women with severe FOC (WDEQ-A ≥ 85), is presented in Table 1 (n = 352). After using the Fisher exact test to explore differences in mode of birth (elective CB vs other methods) between women with high FOC (WDEQ-A ≥ 85) and low (WDEQ-A < 85) fear of childbirth, weak differences were detected ($P = .074$). Although the percentage of elective cesarean was double among women with high FOC (21% vs 10%), and an unadjusted logistic regression showed increased odds of women with high FOC electing for cesarean, the 95% confidence interval crossed 1 (OR: 2.40, 95% CI: 0.91-6.36, $P = .077$).

4 | DISCUSSION

The prevalence of severe FOC (≥85) in an inner-city London maternity population was estimated as 3% (95% CI: 2%-6%). Common mental disorders (depression and anxiety) were associated with higher FOC. There was limited evidence showing a relationship between severe FOC and elective CB. To the best of our knowledge, this is the first

TABLE 2 Unadjusted and weighted adjusted regressions of associations between mental health disorders and WDEQ-A scores (n = 377)

Predictor	Unadjusted coefficient	*P*-value	Weighted adjusted[d] coefficient (95%CI)	*P*-value
Depression[a]	14.66 (8.92-20.40)	<.001	18.69 (10.50-26.88)	<.001
Anxiety[b]	11.14 (4.80-17.49)	.001	13.25 (3.66-22.85)	.007
Common mental disorders[c]	14.71 (9.73-19.68)	<.001	15.75 (8.08-23.42)	<.001

[a]Includes major depressive disorder, major depressive episode, and mixed depression and anxiety.

[b]Includes panic disorder, social phobia, obsessive-compulsive disorder, generalized anxiety disorder, and agoraphobia.

[c]Depression (as above), anxiety (as above).

[d]Adjusted for age, parity, education, relationship status, and planned pregnancy. Sampling weights and inverse probability weights to account for missingness.

TABLE 3 Summary of final adjusted multivariable regression models of associations between mental health disorders and WDEQ-A scores (n = 377)

(a) Associations between exposure maternal depression and continuous outcome fear of birth		
	Fear of childbirth	
R^2	**0.09**	
Predictors	**Coefficient (95%CI)**	***P*-value**
Depression[a]	18.69 (10.50 to 26.88)	<.001
Maternal age (years)	0.51 (−0.06 to 1.09)	.080
Maternal highest education level		
None/school qualifications/college level	Reference	
Degree level/postgraduate qualifications	4.91 (−0.91 to 10.72)	.098
Relationship status		
Married/cohabiting	Reference	
Single/not cohabiting	−2.07 (−11.49 to 7.34)	.665
Multiparous		
No	Reference	
Yes	−0.23 (−5.60 to 5.13)	.933
Planned pregnancy		
Planned	Reference	
Not planned	2.39 (−4.31 to 9.08)	.484
(b) Associations between exposure maternal anxiety disorder and continuous outcome fear of childbirth		
	Fear of childbirth	
R^2	**0.08**	
Predictors	**Coefficient (95%CI)**	***P*-value**
Anxiety disorder[b]	13.25 (3.66 to 22.85)	.007
Maternal age (years)	0.59 (0.01 to 11.00)	.046
Maternal highest education level		
None/school qualifications/college level	Reference	
Degree level/postgraduate qualifications	5.21 (0.59 to 11.00)	.078
Relationship status		
Married/cohabiting	Reference	
Single/not cohabiting	2.60 (−4.75 to 9.96)	.487
Multiparous		
No	Reference	
Yes	−1.02 (−6.43 to 4.40)	.712
Planned pregnancy		
Planned	Reference	
Not planned	2.96 (−3.96 to 9.89)	.083
(c) Associations between exposure maternal common mental disorder and continuous outcome fear of childbirth		
	Fear of childbirth	
R^2	**0.11**	
Predictors	**Coefficient (95%CI)**	***P***
Common mental disorder[c]	15.75 (8.08 to 23.42)	<.001
Maternal age (years)	0.56 (0.00 to 1.12)	.049

TABLE 3 (Continued)

(c) Associations between exposure maternal common mental disorder and continuous outcome fear of childbirth		
	Fear of childbirth	
R^2	**0.11**	
Predictors	**Coefficient (95%CI)**	***P***
Maternal highest education level		
None/school qualifications/college level	Reference	
Degree level/postgraduate qualifications	5.16 (0.61 to 10.94)	.079
Relationship status		
Married/cohabiting	Reference	
Single/not cohabiting	1.28 (−6.01 to 8.57)	.954
Multiparous		
No	Reference	
Yes	−0.46 (−5.76 to 4.83)	.864
Planned pregnancy		
Planned	Reference	
Not planned	2.56 (−4.13 to 9.05)	.464

[a]Includes major depressive disorder, major depressive episode, and mixed depression and anxiety.

[b]Includes panic disorder, social phobia, obsessive-compulsive disorder, generalized anxiety disorder, and agoraphobia.

[c]Depression (as above), anxiety (as above).

study conducted using a United Kingdom cohort of pregnant women to estimate the prevalence of severe FOC (using the WDEQ-A cutoff ≥85) and to examine the associations between common mental disorders and FOC using a representative sample of maternity service users from inner-city South-East London.

The estimated FOC prevalence reported in the current study (3%, 95% CI: 2%-6%) is substantially lower than most previously reported estimates of between 6% and 30%,[8-10] with one systematic review reporting 11% (8%-16%) based on studies using a cutoff of WDEQ-A ≥ 85.[2] The pregnancy gestation of women at the time of completing the questionnaire is important to consider. The current study administered the WDEQ-A at mid-pregnancy, whereas the other comparable studies reporting higher prevalence used the questionnaire during late pregnancy (32 weeks +) when women may report higher levels of fear.[16,32,44-46] However, similar to our study, one large Danish study (n = 30 480) found a prevalence of 3.2% among women reporting FOC at both 16 weeks and 32 weeks.[14] Thus, cross-cultural population prevalence may differ[9,47] and our prevalence estimate may only reflect that of the South-East London United Kingdom population. Our results are similar to another large Finnish study of 788 317 women, which found that 2.5% of nulliparous and 4.5% of multiparous women experienced FOC.[17] FOC was identified by ICD-10, a diagnosis established once a woman had been referred for specialist FOC treatment. As such, this Finnish study estimated the prevalence of woman with "severe FOC" who required intervention.

The association between common mental disorders (anxiety and depression) and severe FOC is in line with previous literature.[5,14,16-22] As FOC has been considered as a form of anxiety disorder,[1,48] it may not be surprising that anxiety disorders were associated with higher FOC. Tokophobia, defined as an extreme form of FOC, is also viewed as a form of anxiety disorder (specific phobia).[10] Depression is characterized by low mood, anhedonia, and hopelessness.[49] These symptoms may be expressed by women with FOC where hopelessness and worthlessness experienced in depression contribute to negative feelings about childbirth and low self-efficacy, as these have been identified as potential reasons for fearing childbirth.[5] Maternal common mental disorders are prevalent in pregnancy and are reported to affect outcomes for women and their infants.[50,51] Therefore, maternity professionals should be aware of the increased risks of severe FOC in women with depression or anxiety disorders.

Finally, in clinical practice, women that have no medical indication for surgery, but suffer from FOC are permitted to request an elective CB.[11] However, contrary to previous research,[17,18,26] we found weak evidence for an association between FOC and opting for elective CB, though the direction of effect was as expected. Our null findings could be explained by the small sample size of women having an elective CB. There are other studies with similar findings and comparable sample sizes to our study, conducted in Yorkshire (England, n = 396) and Cork (Republic of Ireland, n = 388).[27,52]

This study has several strengths. We used weights to account for bias from stratified sampling, attrition, and missing data at follow-up. No previous studies to our knowledge have used weights to account for bias in a similar way to the current study. The study had a diverse sample of women, and language interpreters were used to enable non–English-speaking women to take part; this helped to ensure participants were representative of the study population. The study used the SCID to identify depression and anxiety—a "gold standard measure". Whereas the majority of previous studies relied on screening questionnaires.[16,20-22,38,46,53-55] Lastly, we used the WDEQ-A to identify FOC and a cut-off of 85 or above, the most validated and widely used measure to define severe FOC.[9,16,25,26,31-33,56]

The current study has some limitations. As a result of missing data, the sample size was relatively small (n = 352) to investigate the associations between FOC and birth mode (elective CB). The confidence intervals for estimated prevalence of severe FOC and common mental disorders (depression and anxiety disorder) were wide. The causal direction of associations cannot be determined, as mental disorders were only measured during early pregnancy and FOC during mid-pregnancy, but FOC could have existed before any mental disorders. Finally, as women were only recruited from one maternity unit in inner-city London, the results may not be generalizable to other areas, such as rural areas of the United Kingdom. Future work should extend the current findings by using a larger sample of women representing the United Kingdom population and collecting repeated measures of data on FOC and mental disorders at preconception, during pregnancy and in the postnatal period. This would inform better understanding of causal directions.

4.1 | Conclusions and implications

This study revealed that severe FOC affects an estimated 3% of pregnant women living in inner-city London. Depression and anxiety disorders were associated with higher rates of FOC. Although only 53% of maternity units in the United Kingdom offer specialist support for women with FOC,[13] the NHS Long Term Plan includes expansion of maternity mental health provision, which is to be welcomed.[57] Research is now needed on how to effectively identify and support pregnant people by helping to manage both their FOC and associated mental disorders. More work is also needed to develop interventions to prevent FOC.

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CONFLICT OF INTEREST

The authors report no conflict of interest.

ETHICAL APPROVAL

The research was approved by the National Research Ethics Service, London Committee—Camberwell St Giles (ref no 14/LO/0075). Participants were provided with study information sheets, which was fully explained to them, had the opportunity to ask questions, and gave informed consent before taking part the study. No adverse events occurred for women taking part in the study during the research interview. Where risk (eg, significant suicidality, safeguarding issues) was identified during the research interview, researchers discussed this with the study PI and the woman's midwife and/or GP were informed, following consent to information sharing by the study participant (all women were aware this occurred and consented to this).

PATIENT INVOLVEMENT

The development of the WENDY study, research measures, grant application, and study protocol were informed by our patient and caregiver advisory group. The patient advisory group included women with a range of mental disorders who were interested in our study program. Regular meetings were held to discuss the WENDY study and the related studies within the NIHR-funded program.

DATA AVAILABILITY STATEMENT

Full study protocol (approved by the Research Ethics Committee) and patient-level data are available from Chief Investigator Professor Louise Howard (louise.howard@kcl.ac.uk). Consent for data sharing was not obtained, but the presented data are anonymized and risk of identification is very low.

ORCID

Selina Nath https://orcid.org/0000-0002-5976-1301

ENDNOTE

[1] We acknowledge that some individuals who are pregnant and giving birth may not identify or define themselves as a woman/mother.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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