ORIGINAL RESEARCH ARTICLE

The prevalence and risk factors of fear of childbirth among pregnant women: A cross-sectional study in Ireland

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Abstract

Introduction: There is growing evidence of the considerable impact of fear of childbirth on women's health and well-being, but prevalence reports of high and severe fear of childbirth and reported risk factors have been inconsistent in various studies. Therefore, this study aimed to determine the prevalence of high and severe fear of childbirth, and to identify risk factors of childbirth fear.

Material and methods: A cross-sectional study was conducted among a convenience sample of 882 pregnant women attending antenatal care in Cork, Ireland. Fear of childbirth was assessed using the Wijma Delivery Expectancy Questionnaire version A (W-DEQ A) using a cut-off ≥66 to define high fear and ≥85 to define severe fear. Associated risk factors were investigated using univariate and multivariate multinomial logistic regression analyses. Four W-DEQ A subscales were calculated using a cut-off ≥2.5 to determine the nature of childbirth fear.

Results: Overall prevalence of severe fear of childbirth was 5.3% and high fear of childbirth was 36.7%. The prevalence of severe fear of childbirth was 7.4% in nulliparous women and 4.3% in multiparous women; however, the difference was not statistically significant (P < 0.07). The prevalence of high fear of childbirth was 43% in nulliparous women and 33.6% in multiparous women, and this difference was statistically significant (P < 0.005). High fear of childbirth was associated with single marital status when compared with married or co-habiting women (P < 0.008). In a multivariate analysis, high fear of childbirth was significantly associated with low perceived informational support (adjusted relative risk ratio 2.62, 95% confidence interval [CI] 1.34-5.13) and possible depression (assessed by the Edinburgh Postnatal Depression Scale) (adjusted relative risk ratio 12.87, 95% CI 6.07-27.25). In the W-DEQ A subscales, 35.6% of women scored ≥2.5 in Negative Emotions, 29.4% scored ≥2.5 in Lack of Positive Emotions, 9.9% scored ≥2.5 in Social Isolation and 7.8% scored ≥2.5 in Moment of Birth.

Conclusions: Fear of childbirth is relatively common, with varying severity, and was more common in first-time mothers. Using W-DEQ A subscales provided additional information about the nature of the fear, in addition to severity of fear of childbirth.

Abbreviations: BMI, body mass index; CI, confidence interval; EPDS, Edinburgh Postnatal Depression Scale; FOC, fear of childbirth; PICSS, perinatal infant care social support scale; RRR, relative risk ratio; W-DEQ A, Wijma Delivery Expectancy/Experience Questionnaire version A.
1 | INTRODUCTION

Fear of childbirth (FOC) exists on a continuum from normal worries and fears, to severe fear, (tocophobia).1-3 Although tocophobia is not clearly defined, the adverse impact of FOC on women's health and well-being in the perinatal period is well-established.1,4,5 Previous studies have reported that sleep disturbances, nightmares, palpitations, stomach pains, panic attacks, flashbacks (after trauma) and a request for a cesarean are associated with FOC.4,6-8 Furthermore, the impact on emotional well-being may be long-term and powerful, affecting partner relationships9 and breastfeeding.10

Prevalence estimates from single country11 and multi-country2 studies differ (3.7%-43%),2 due to poor consensus on definition and to various methods of measuring FOC.2,12,13 A meta-analysis estimated the global pooled-prevalence at 14%,2 noting increased prevalence in recent years, which may be attributable to increased awareness and reporting.2 Notably, no Irish study on the prevalence of FOC was retrieved in the systematic literature search.2 The meta-analysis found inconsistent evidence in relation to parity and FOC, with the majority of studies reporting higher prevalence in first-time mothers2 but with some studies reporting higher prevalence in parous women.2,13,14 Previous research suggests an association between low perceived social support and FOC.6,7

The Wijma Delivery Expectancy Questionnaire version A (W-DEQ A)12 is the most commonly used tool to measure FOC severity5 and is validated in many countries and languages.2 The prevalence of severe FOC (defined as W-DEQ A ≥85) is reported to be between 5% and 21%2 and high FOC (W-DEQ A ≥66) between 24% and 26%.2,11,15 Researchers2,12 suggest that the W-DEQ A consists of four subscales,12 which may facilitate healthcare professionals’ assessment of the nature of FOC, in addition to assessing severity, thereby facilitating a more personal approach to support offered to women.12 There is limited evidence in relation to these subscales at present, thus assessing the subscales in various cultural settings was recommended.12

Due to this knowledge gap, the primary objective of this study was to establish the prevalence of high and severe FOC in a sample of pregnant women in Ireland. Secondary objectives were to identify potential risk factors of high FOC and to elucidate the nature of FOC by applying W-DEQ A subscales in this study.

2 | MATERIAL AND METHODS

2.1 | Study design and population

We conducted a cross-sectional study between April 2015 and June 2016 in Cork, Ireland. A convenience sample of pregnant women attending routine antenatal appointments was recruited from public and private clinics. Recruitment took place over time periods when the researchers were available to recruit, rather than a consecutive period of time, since the study was carried out as part of part-time doctoral studies by the research midwife. The midwife trained the undergraduate students to recruit women to the study and either the midwife or research students invited pregnant women to participate. All the participants were planning to give birth at Cork University Maternity Hospital. Participation in this study was short, requiring the completion of just one questionnaire. The follow up to the study for pregnancy outcomes was done using access to medical charts and the outcome data will be presented in a separate publication.

In Ireland, universal maternity benefits are available to all women, which means that free care is available during pregnancy and up to 6 weeks postpartum for those ordinarily resident.16 The predominant model of care is obstetric-led, with combined care involving the woman’s GP being provided under the HSE Maternity & Infant Care Scheme.16 Women who choose shared care are seen by several different midwives and hospital doctors during their pregnancy, normal births would be facilitated by midwives and operative births by an obstetrician. Domiciliary Care In and Out of Hospital (DOMINO) is an option available in certain counties for women considered “low risk” and within a certain local radius of the hospital, allowing continuity of midwifery care and early discharge home. Private antenatal care led by one obstetric consultant is available for a fee. Private maternity care is available at all 19 maternity units in Ireland and there is also one fully private unit.

The study population included; women >18 years, able to complete the questionnaire in English, and between 12 and 24 weeks’ gestation at the time of recruitment. Previous studies suggest that FOC is not a stable construct and FOC levels may increase in the third trimester.11

2.2 | Variables

We developed a questionnaire package based on the literature to meet the aims of the study. Demographic information collected included: age (by category), marital status, country of birth, education, smoking, weight, height and employment status. Women were asked to rate their general health from 1 to 5 (poor to very good). Obstetric questions included: gestational age, number of previous children, number of previous miscarriages or stillbirths, any maternal or fetal
complications in current or previous pregnancies and woman’s preference for normal birth or cesarean. Psychological factors examined included: a history of anxiety, depression or postnatal depression using closed questions and the Edinburgh Postnatal Depression Score (EPDS). FOC was measured using the English W-DEQ A$^3$, a self-assessment rating scale comprising 33 questions on a Likert scale. Negative questions are reverse-scored and a total calculated, with scores of 0-165 possible. To determine severity of FOC, women scoring ≥85 were classified as having severe FOC$^{3,11}$ ≥66, high FOC$^{15}$ 38-65, moderate FOC and ≤37, low fear. Data on women who answered a minimum of 27 questions were included, as advocated in a European cohort study.$^7$ To investigate the nature of FOC, four W-DEQ A subscales (developed by researchers$^{12}$ who refined the original W-DEQ A$^{13}$) were also applied: (1) "Negative Emotions"—containing questions relating to self-efficacy, negative appraisal and lack of positive anticipation (comprising five items: 2, 6, 8, 12, 19); (2) "Lack of Positive Emotions"—containing questions about being happy, relaxed, confident and safe (comprising five items: 5, 9, 17, 18, 23); (3) "Social Isolation"—containing questions relating to perceived social support (comprising four items: 3, 7, 11, 15); and (4) "Moment of Birth"—containing questions relating to how the woman imagines she will feel during birth (comprising three items: 28, 29, 30).$^{12}$ Using a cut-off ≥2.5 (the midpoint) was recommended for comparison purposes.$^{12}$ The EPDS is a widely used and well-validated self-report screening tool for recognizing women at risk of perinatal depression.$^{17,18}$ Negative questions are reverse-scored and a total score calculated, with scores of 0-30 possible. A systematic review of studies validating the use of EPDS in antenatal and postpartum women, recommended using a cut-off of 9 or 10 for very likely risk of depression.$^{18}$ Therefore, a cut-off ≥10 was used in this study.$^{18}$ The Perinatal Infant Care Social Support Scale (PICSS)$^{19}$ was used to measure maternal social support by investigating functional social support using four domains—informal, structural, emotional and appraisal support.$^{20}$ and structural social support or people available in a person’s social networks (formal and informal).$^{19,20}$ An individual score was calculated for each domain. For emotional and instrumental support domains, low support was defined as a score ≤20.$^{19}$ For emotional and appraisal support domains, low support was defined as a score <12. Structural social support was measured by asking which individuals from the participant’s social network (ie, formal, such as health professionals, and informal, such as family/friends) would be available to provide the four types of functional support. Formal or informal structural support was considered available if any type of support was available from at least one source.$^{19}$ The questionnaire was piloted for ease of use with the first 100 women; the font size was increased on the PICSS, as it was deemed unclear in the initial format.

### 2.3 Statistical analyses

IBM SPSS Version 22.0 statistical software program (IBM Corp., Chicago, IL, USA) was used for all statistical analyses. When determining sample size, the literature was examined and a sample of 1000 women deemed adequate on the basis of findings of previously published prevalence studies.$^{11}$ Descriptive statistics were calculated for all variables and presented as n (%) or mean with standard deviation as appropriate. Following this, scores were calculated for each standardized measure (EPDS and W-DEQ A). FOC prevalence was estimated using the whole study population and subsequently in subgroups according to a priori chosen variables: parity, marital status and history of pregnancy loss (history of miscarriage or stillbirth). Student’s t-tests were used for continuous variables and chi-square tests for categorical variables as appropriate. $P < 0.05$ was considered statistically significant. The W-DEQ A was treated as a categorical variable (0-37, 38-65, 66-165) for this analysis because the study was not adequately powered for the risk factor analysis of the W-DEQ A ≥85 category. When there were ≤6 missing items, each item was replaced by the series mean for each participant$^2$ and total score calculated (n = 44). Participants with ≥7 W-DEQ A items were excluded. Internal consistency in each scale used was determined using Cronbach’s co-efficient alpha$^{21}$ (0.70 was the minimum acceptable measure of instrument reliability). In our study, scale reliability was high; Cronbach’s α values for W-DEQ A, PICSS (functional), PICSS (structural) and EPDS were 0.89, 0.97, 0.81 and 0.99, respectively. Individual variables from the original W-DEQ A were combined as recommended,$^{12}$ to calculate the four subscales. Missing data were handled in the same way as for the original W-DEQ A. The median and interquartile range were reported for each of the four W-DEQ A subscales and each individual subscale reported using a cut-off ≥2.5. Relative risk ratio (RRR) and 95% confidence intervals (CI) were calculated to examine the association between each selected variable and risk of high FOC, using univariate multinomial logistic regression analysis, followed by multivariate multinomial logistic regression analysis. Variables with a P value < 0.15 in the univariate models were included in the multivariate models (maternal age, marital status, employment, smoking, body mass index [BMI], living with partner, EPDS history of anxiety with treatment, history of depression, history of postnatal depression, low formal and informal social support).

### 2.4 Ethical approval

This study obtained full ethical approval from the Cork Research Ethics Committee for the Teaching and Learning Hospitals ECM 4 (06/01/15) and ECM 3 (03/03/15). The study was explained using the information leaflet (explaining the voluntary nature of the study), eligibility clarified and written consent (separate from the questionnaire) obtained. Participants returned completed questionnaires to a sealed box.

### 3 RESULTS

A total of 1180 women were invited to participate; 1056 women consented and were given questionnaires. Of these, 1001 pregnant women self-completed and returned questionnaires (Figure 1). Data on
demographics for 69 women who refused to participate are not available but reasons for declining are outlined in Figure 1. Fifty-five women were ineligible. A further 21 (2%), returned ineligible questionnaires (Figure 1). Although there was a high overall response rate (n = 980 [85%]), outcome data were available for 882 (75%) of these women. Participants had a median gestational age of 20 weeks and interquartile range 15–21.

3.1 | Demographic and maternal characteristics
Demographic characteristics (n = 882) are summarized in Table 1. The majority of women were aged 31–35 years (44%, n = 388) and married (62.2%, n = 549). Most women were Irish (78%, n = 688), employed (64.5%, n = 569) and had a university education (39.9%, n = 352). Sixty-eight women (7.7%) were self-reported smokers. Of the total sample, 298 (33.8%) were nulliparous and 581 (65.9%) women were multiparous and three women did not report parity. Three women who reported the current pregnancy as their first, stated they had at least one child at home; this may be a partner’s child or adopted child (Table 1). At least one pregnancy loss was reported by 174 (19.7%) women (Table 1).

3.2 | Prevalence of fear of childbirth
Of the 882 study participants, 47 women scored W-DEQ A ≥85, resulting in a prevalence of 5.3% with severe FOC, and 324 women scored W-DEQ A ≥66, resulting in a prevalence of 36.7% with high FOC. The prevalence of severe FOC was 7.4% (n = 22) in nulliparous women and 4.3% (n = 25) in multiparous women (Table 2), but there was no statistically significant difference when compared (P < 0.07). The prevalence of high FOC (W-DEQ A ≥66) was 43% (n = 128) in nulliparous women, and 33.6% (n = 195) in multiparous women (Table 2); when compared, the difference was statistically significant (P < 0.005). The prevalence of severe FOC among women who reported at least one pregnancy loss was 4.3%, and 5.2% among women who reported no pregnancy loss; this difference was not statistically significant (P = 0.34) and was not significant for high fear (P = 0.38). The minimum W-DEQ A score reported was 1 and the maximum 128.

3.3 | Risk factors of fear of childbirth
The analysis of demographic factors revealed that high FOC was significantly more common among women who identified themselves as single (P < 0.008) when compared with married or cohabiting women, but there was no difference at the severe level of fear (P = 0.13). Adjusted results from the multivariate analysis are presented in Table 3. In terms of psychological factors, a history of depression or current depressive symptoms per the EPDS were identified as statistically significant factors associated with.
## TABLE 1  Demographic and maternal characteristics of participants

|                           | Total sample | Parity*  |
|---------------------------|--------------|----------|
|                           | n (%)        | Nulliparous n (%) | Multiparous n (%) |
| **Gestational age**       | 882 (100.0)  | 298 (100.0)    | 581 (100.0)       |
| Mean (SD, range)          | 18.39 (3.40, 12) | 18.42 (3.32, 12) | 18.37 (3.43, 12) |
| Missing                   | 9 (1.0)      | 2 (0.7)           | 6 (1.0)           |
| **Age**                   |              |                    |                   |
| 18–25                     | 97 (11.0)    | 57 (19.1)         | 40 (6.9)          |
| 26–30                     | 192 (21.8)   | 90 (30.2)         | 101 (17.4)        |
| 31–35                     | 388 (44.0)   | 114 (38.3)        | 273 (47.0)        |
| ≥36                       | 196 (22.2)   | 35 (11.7)         | 161 (29.7)        |
| Missing                   | 9 (1.0)      | 2 (0.7)           | 6 (1.0)           |
| **Marital status**        |              |                    |                   |
| Married or Co-habiting    | 793 (89.9)   | 253 (84.9)        | 539 (92.8)        |
| Other (Single, Divorced, Separated) | 80 (9.1) | 42 (14.1)         | 37 (6.4)          |
| Missing                   | 9 (1.0)      | 3 (1.0)           | 5 (0.9)           |
| **Country of birth**      |              |                    |                   |
| Republic of Ireland       | 688 (78.0)   | 240 (80.5)        | 446 (76.8)        |
| UK & Northern Ireland     | 62 (7.0)     | 21 (7.0)          | 41 (7.1)          |
| Other                     | 127 (14.4)   | 37 (12.4)         | 90 (15.5)         |
| Missing                   | 5 (0.6)      | 0 (0.0)           | 4 (0.7)           |
| **Duration of residence** |              |                    |                   |
| ≤10 years                 | 107 (12.1)   | 33 (11.1)         | 74 (12.7)         |
| ≥11 years                 | 82 (9.3)     | 25 (8.4)          | 57 (9.8)          |
| Always resident in Ireland| 693 (78.6)   | 240 (80.5)        | 450 (77.5)        |
| **Education/Qualifications** |           |                    |                   |
| Secondary School          | 160 (8.1)    | 55 (18.5)         | 105 (18.1)        |
| Some College              | 202 (22.9)   | 61 (20.4)         | 130 (24.1)        |
| Bachelor’s degree or Higher | 511 (57.9) | 180 (60.4)        | 330 (56.8)        |
| Missing                   | 9 (1.0)      | 2 (0.7)           | 6 (1.0)           |
| **Employment**            |              |                    |                   |
| Employed                  | 732 (83.0)   | 260 (87.3)        | 470 (80.9)        |
| Unemployed                | 40 (4.5)     | 16 (5.3)          | 23 (4.0)          |
| Student                   | 20 (2.3)     | 15 (5.0)          | 5 (0.9)           |
| Homemaker                 | 86 (9.8)     | 5 (1.7)           | 81 (13.9)         |
| Missing                   | 4 (0.5)      | 2 (0.7)           | 2 (0.3)           |
| **Body mass index**       |              |                    |                   |
| Underweight or Normal weight ≤24.9 | 442 (50.1) | 142 (47.6)        | 300 (51.7)        |
| Overweight 25.0-29.9      | 245 (27.8)   | 93 (31.2)         | 152 (26.2)        |
| Obese ≥30.0               | 71 (8.1)     | 18 (6.1)          | 53 (9.1)          |
| Missing                   | 124 (14.0)   | 45 (15.1)         | 76 (13.1)         |
| **Smoking status**        |              |                    |                   |
| Smoker                    | 68 (7.7)     | 23 (7.7)          | 45 (7.7)          |
| Non-smoker                | 805 (91.3)   | 271 (90.9)        | 534 (91.9)        |
| Missing                   | 9 (1.0)      | 4 (1.3)           | 2 (0.3)           |

(Continues)
high FOC in the multivariate analysis (EPDS >6 [adjusted RRR 2.8, 95% CI 1.7-4.7, and EPDS >10 [adjusted RRR 12.9, 95% CI 6.1-27.3]) (Table 3). The importance of social factors on high FOC was demonstrated in the results of the multivariate analysis; those with low informational support (PICSS ≤20) were more likely to report high FOC (adjusted RRR 2.6, 95% CI 1.3-5.1) (Table 3).

3.4 | W-DEQ A subscales

Table 4 presents results obtained from our analysis of the four W-DEQ A subscales. In the first subscale, Negative Emotions, 35.6% (95% CI 32.5-38.8) women scored ≥2.5. In the second subscale, Lack of Positive Emotions, 29.4% (95% CI 26.5-32.5) women scored ≥2.5. In the third subscale, Social Isolation, 9.9% (95% CI 8.1-12.0) women scored ≥2.5. Finally, in the fourth subscale, Moment of Birth, 7.8% (95% CI 6.2-9.8) of women scored ≥2.5. Cronbach’s α for each of the four subscales was acceptable (0.78, 0.71, 0.76 and 0.80, respectively).

4 | DISCUSSION

To the best of our knowledge, this is the first Irish prevalence estimate of FOC. International prevalence studies use various
measurement and sampling methods, but our results are similar and therefore of value. Other studies using W-DEQ A ≥85 also reported a prevalence of 5% in Australia and Europe, including Belgium, Iceland, Denmark, Estonia and Norway. The latter study found a prevalence of 4.5% in Belgium and a higher prevalence (9%-16%) in the other countries. A large epidemiological cohort study from Finland, where FOC is well recognized in maternity care, used ICD-10 codes to define FOC and reported the lowest prevalence of

| TABLE 3 Multivariate multinomial logistic regression analysis of psychosocial factors associated with fear of childbirth |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Risk factor                                      | W-DEQ A 0-37: Low fear | W-DEQ A 38-65: Moderate fear | W-DEQ A 66-165: High to severe fear |
| n                                                | Reference group | aRRR (95% CI) | P value | aRRR (95% CI) | P value |
| History of anxiety                               | 673             | Ref           | 0.98 (0.57, 1.69) | 0.95 | 0.81 (0.46, 1.44) | 0.48 |
| History of depression                            | 767             | Ref           | 1.18 (0.54, 2.56) | 0.68 | 2.10 (0.96, 4.57) | 0.06 |
| EPDS                                             | 294             | Ref           | 1.99 (1.26, 3.14) | 0.003 | 2.81 (1.68, 4.70) | 0.000 |
| ≥10 (likely depression)                         | 210             | Ref           | 3.26 (1.57, 6.78) | 0.002 | 12.87 (6.07, 27.25) | 0.000 |
| Social support                                   | 882             | Reference group | aRRR (95% CI) | P value | aRRR (95% CI) | P value |
| Low informational support (PICSS ≤20)            |                  |                |                |        |                |        |
| High support                                     | 612             | Ref           | 2.34 (1.22, 4.47) | 0.01 | 2.62 (1.34, 5.13) | 0.005 |
| Low support                                      | 270             | Ref           |                |        |                |        |
| Low instrumental support (PICSS ≤20)             | 412             | Ref           |                |        |                |        |
| Low support                                      | 470             | Ref           | 1.06 (0.68, 1.66) | 0.79 | 1.50 (0.93, 2.41) | 0.096 |
| Low emotional support (PICSS ≤12)                | 711             | Ref           |                |        |                |        |
| Low support                                      | 55              | Ref           |                |        |                |        |
| Social support                                   | 116             | Ref           | 0.88 (0.26, 3.02) | 0.84 | 1.47 (0.41, 5.26) | 0.56 |
| Low functional appraisal support (PICSS ≤12)     | 697             | Ref           |                |        |                |        |
| Low support                                      | 69              | Ref           | 1.41 (0.45, 4.45) | 0.55 | 1.61 (0.51, 5.13) | 0.41 |
| Social support                                   | 116             | Ref           |                |        |                |        |
| Social support                                   |                  |                |                |        |                |        |
| Formal social supports (any type of support available from each source PICSS) |                  |                |                |        |                |        |
| Yes                                              | 674             | Ref           |                |        |                |        |
| No                                               | 183             | Ref           | 1.16 (0.67, 2.01) | 0.60 | 1.29 (0.73, 2.29) | 0.38 |
| Social support                                   | 25              | Ref           |                |        |                |        |
| Social support                                   |                  |                |                |        |                |        |
| Informal social supports (any type of support available from each source PICSS) |                  |                |                |        |                |        |
| Yes                                              | 851             | Ref           | 0.51 (0.17, 1.53) | 0.23 | 0.86 (0.29, 2.55) | 0.79 |
| No                                               | 31              | Ref           |                |        |                |        |

Ref, reference group; W-DEQ A, Wijma Delivery Experience Questionnaire Part A; EPDS, Edinburgh Postnatal Depression Score; PICSS, Perinatal Infant Care Social Support Scale, P value significance 0.05; aRRR, adjusted relative risk ratio; 95% CI, 95% confidence interval; -, no results possible. Only variables that were significant in the univariate analysis P ⩽ 0.15 were included in the multivariate analysis (ie, Age, Marital Status, Employment, Smoking, BMI, Living with, Risk of Depression [EPDS >10], Self-reported History of Anxiety with treatment, Self-reported History of Depression, History of Postnatal Depression, and PICSS Informational, Instrumental, Emotional, Functional Appraisal and Formal Supports).
3.7%. Limited data in relation to FOC in low-middle income countries suggest prevalence may be higher there. A study in India determined a prevalence of 17.7% using a binary question regarding FOC. The prevalence of high FOC (W-DEQ A ≥66) in the present study was high compared with other studies, since previous research assessing high FOC using W-DEQ A ≥66 in Sweden, Canada and Australia found a prevalence of between 24% and 26%.

In this study, high FOC was associated with first-time mothers (P < 0.005). These findings are in line with similar findings in at least nine studies, but one study found that FOC was more common in multiparous women, and two studies showed no association between FOC and parity. In the present study, we found no significant difference in prevalence in women with and without previous pregnancy loss, which was associated with FOC in a large epidemiological study.

Our finding that women who identified themselves as single were more likely to have high FOC is aligned with findings from previous research. Consistent with previous studies, we found a statistically significant association between high FOC and depression. A large register-based study of pregnant women referred for consultation with FOC (n = 2405) in Finland reported that women with FOC were twice as likely to experience mental health morbidity. They recommended assessing the psychological status of all pregnant women, interdisciplinary support for mental health, and postnatal follow-up assessment as appropriate.

This is the first study, to our knowledge, using the PICSS to investigate FOC and social supports. Whereas previous studies found an association of high FOC with a poor social network or low self-efficacy, we did not locate any studies which specifically investigated low perceived informational support. Thus, our finding that low perceived informational support increased the risk of high FOC almost threefold is important (adjusted RRR 2.6, 95% CI 1.34-5.13) and this factor may be potentially modifiable. Informational support can be defined as the exchange of knowledge, advice or feedback on actions. Therefore, if this factor were identified, midwives should aim to provide women with adequate, consistent information about birth in a way which does not trigger anxiety, ensuring sufficient time and emotional support are available in line with World Health Organization guidance. Moreover, Sheen et al suggested that women with FOC have an increased need for informational support since they are more likely to expect a negative outcome from an ambiguous situation due to a characteristic “intolerance of uncertainty”. Findings from a qualitative study in Australia suggest that women with FOC tend to avoid thinking or talking about birth and learning what to expect in labor, and reported that FOC was influenced by the quality of information from professionals. Traditionally, new mothers rely on healthcare professionals, books, family and friends for information, but digital technologies are creating new forms of social support and information sources. The influence of digital technologies may be worth investigating, since social media are commonly accessed and information quality may be dubious. The role of a strong social network becomes increasingly significant in the perinatal period for women with childbirth fear.

| TABLE 4 | W-DEQ A subscales |
| --- | --- |
| Subscale | W-DEQ A ≥66 |
| Sample | Total n (%) Nulliparous Multiparous Total n (%) Nulliparous Multiparous Total n (%) Nulliparous Multiparous |
| Negative emotions | |
| Median 9.20 4.00 5.00 2.33 2.33 2.33 |
| IQR 4.00 3.00 4.00 2.33 2.33 2.33 |
| Score ≤2.49 568 (64.4) 139 (46.6) 428 (73.7) 623 (70.6) 206 (69.1) 415 (71.4) 795 (90.1) 265 (88.9) 527 (90.7) 813 (92.2) 270 (98.6) 540 (92.8) 41 (7.1) |
| Score ≥2.50 314 (35.6) 199 (63.4) 115 (20.3) 259 (29.4) 92 (30.9) 166 (28.6) 87 (9.9) 35 (11.1) 54 (9.3) 41 (7.1) |
An important finding in the present study was 35.6% of all women and 53.4% of nulliparous women scored ≥2.5 in the W-DEQ A sub-scale “Negative Emotions”. Women with low self-efficacy find it difficult to manage labor and may be more likely to have a cesarean, thus discussing their fears may facilitate positive birth preparation, information giving and coping strategies.

Investigating women’s concerns is clinically important, but more work is required to verify the utility of the W-DEQ A subscales.

A major strength is the high response rate (85%), a relatively large sample size for this research topic. The questionnaires used in this study were a validated and commonly used measure for FOC (W-DEQ A) using the original cut-offs. We were also able to apply the proposed W-DEQ A subscales.

When considering generalizability and external validity of the study, the convenience sample which was recruited from a single site and not selected randomly must be taken into account. This may limit the degree to which results are generalizable to the Irish pregnant population. However, this is one of the largest maternity hospitals in Europe with approximately 8000 births annually and our sample would appear to be comparable with national averages apart from the figure for smoking, which was lower than the most recent national figure of smoking during pregnancy; 39.9% among the study participants compared with 33.5% at the national level. The small difference in higher education rate could be due to the large university based in Cork or because the only available figure is for all females rather than mothers. We cannot rule out, however, that this difference is due to other reasons. With these limitations in mind, findings from this study may still be considered useful.

An important limitation in this study is that multiparous women were not asked about previous birth mode, since women who report a previous negative birth or FOC in one pregnancy are more likely to report FOC in a subsequent pregnancy. Another weakness in the study is that it was primarily designed to estimate the prevalence of FOC but was not powered for the risk factor analysis, which may have led to several associations with moderate to large RRR that were not statistically significant, which could be due to small numbers within categories. The women completed questionnaires only in the second trimester, this is acknowledged as a study limitation. There were missing BMI data for 124 (14.0%) women. BMI was self-reported, with 72 (8.1%) women having missing weight and the rest having missing height and weight. Forty-one (4.6%) women did not complete the EPDS questionnaire. The mean W-DEQ score for women who completed the EPDS was 57.08 and the mean W-DEQ score of women who did not complete the EPDS was 62.66. The data were incomplete for the whole EPDS questionnaire in the 41 participants who did not complete, rather than missing certain questions.

### 5 | CONCLUSION

This study found a similar prevalence of severe FOC but a higher prevalence of high FOC when compared with reported international prevalence. High FOC was associated with depression, being a first-time mother and low perceived informational support; assessing social support, antenatal education provision and high quality information are therefore essential in pregnancy. This study adds to our limited understanding of FOC by using subscales to explore the nature of, as well as the severity of FOC. More investigation of other possible risk factors is recommended for future research.

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CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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