

AOGS MAIN RESEARCH ARTICLE

# Fear of childbirth; the relation to anxiety and depression

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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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## Abstract

**Objective.** To study the associations of anxiety and depression with fear of childbirth. **Design.** A cross-sectional questionnaire study. **Setting.** Prenatal public healthcare in Norway. **Sample.** Pregnant women ( $n=1642$ ) recruited during November 2008 until April 2010. **Methods.** Data were collected by a postal questionnaire at pregnancy week 32. Fear of childbirth was measured by the Wijma Delivery Expectancy Questionnaire (W-DEQ) and by a numeric rating scale. Symptoms of anxiety were measured by the Hopkins Symptom Check List (SCL-25) and symptoms of depression by the Edinburgh Postnatal Depression Scale (EPDS). **Main outcome measure.** Fear of childbirth. **Results.** Eight per cent (137 of 1642) of the women had fear of childbirth ( $W-DEQ \geq 85$ ), 8.8% (145 of 1642) had anxiety ( $SCL-anxiety \geq 18$ ) and 8.9% (146 of 1642) had depression ( $EPDS \geq 12$ ). More than half (56.2%) of the women with fear of childbirth did not have anxiety or depression; however, presence of anxiety or depression increased the prevalence of fear of childbirth (odds ratio 2.4, 95% confidence interval 1.1–5.2 and odds ratio 8.4, 95% confidence interval 4.8–14.7, respectively). Women with both anxiety and depression had the highest prevalence of fear of childbirth (odds ratio 11.0, 95% confidence interval 6.6–18.3). Similar associations of anxiety and depression were estimated by using the numerical rating scale for measuring fear of childbirth. **Conclusions.** Presence of anxiety and depression increased the prevalence of fear of childbirth; however, the majority of women with fear of childbirth had neither anxiety nor depression.

**Abbreviations:** CI, confidence interval; CIDI, Composite International Diagnostic Interview; DSM-IV, Diagnostic and Statistical Manual of mental disorders, fourth version; EPDS, Edinburgh Postnatal Depression Scale; ICD-10, International Classification of Diseases, 10th edition; NRS, numeric rating scale; OR, odds ratio; SCL-25, Hopkins Symptom Check List; W-DEQ, Wijma Delivery Expectancy Questionnaire.

## Introduction

It is assumed that 5–20% of all pregnant women fear giving birth (1,2), and the number of planned cesarean deliveries performed because of fear of childbirth has increased markedly in the Western world (3–6). This is unfortunate, not only because cesarean deliveries are associated with increased risk of maternal complications, but also because of the increased hospital resources required. The causes of fear of childbirth are, however, incompletely understood, and studies on risk factors, other than previous childbirth experiences, are scarce (3). In particular, only few studies have addressed a

possible association of poor mental health with fear of childbirth (7,8).

It is conceivable that women with anxiety are more likely to fear childbirth than others. Previous studies of fear of childbirth and its association with anxiety suffer from small sample size (4–6), low participation rate (4,9) or use of non-validated questions or psychometric instruments (9). Despite their limitations, these studies suggest that women with anxiety are more likely to fear childbirth than women without anxiety (5,6,9,10).

Studies on the association of depression with fear of childbirth are scarce, but suggest women with depression to be at

increased risk (5,9). It has been suggested that depression can reinforce fear of childbirth during pregnancy (11), and that fear of childbirth may be a sign of hidden depression (3). As both depression and anxiety have been associated with fear of childbirth, it may be postulated that, in particular, women with both these conditions fear childbirth.

Among 1642 pregnant women in Norway, we therefore studied the relation between anxiety, depression and anxiety and depression combined, with fear of childbirth.

## Material and methods

Our study was a cross-sectional questionnaire study among women in pregnancy week 32. The women were recruited from an ongoing cohort study at Akershus University Hospital. This hospital is located close to the capital of Norway, and serves a population of approximately 350 000 individuals from both urban and rural areas. During November 2008 until April 2010, pregnant women in gestational week 17 were approached to be recruited at the routine fetal ultrasound examination at the hospital. Only women who could understand written Norwegian could be included in the study. Of the eligible women, 70% agreed to participate and returned the questionnaire at gestational week 32, a total of 1642 women. Their mean age was 31 years (SD 4.7 years, range 18–45 years), 49.9% were first-time mothers and 50.1% of the women had one or more previous deliveries.

Fear of childbirth was measured by the Wijma Delivery Expectancy/Experience Questionnaire version A (W-DEQ) and also by a numeric rating scale (NRS). The NRS was based on the question: 'How much do you fear childbirth?', and the answers were scored from 0 (not at all) to 10 ('extremely much'). We defined fear of childbirth as  $NRS \geq 9$ . The W-DEQ is a 33-item self-assessment rating scale, and each item ranges from 'not at all' (score 0) to 'extremely' (score 5) (12). The sum score may thus range from 0 to 165, and fear of childbirth was defined as  $W-DEQ \text{ sum score} \geq 85$  (13). The English version of the W-DEQ was translated into Norwegian by one of the authors (M.E.-G.). Thereafter, a native English-speaking researcher at the Norwegian Institute of Public Health back-translated the Norwegian version to English. The back-translated version was then compared with the English version in addition to the original Swedish version of the W-DEQ.

Symptoms of anxiety during the past week were measured by 10 items in the Hopkins Symptom Check List (SCL-25) (14,15). The SCL-25 is a widely used self-rating scale, and the first 10 items comprise the anxiety score (SCL-anxiety). Each item ranges from 'not at all' (score 1) to 'extremely' (score 4), and the sum score for anxiety may range from 10 to 40. Presence of anxiety was defined as  $SCL-anxiety \text{ score} \geq 18$  (16–18). The SCL-25 was designed to measure symptoms of depression and anxiety and has been extensively used in

population-based questionnaires in Norway (The website of the Statistics Norway: <http://www.ssb.no>). The Norwegian version of SCL-25 has been validated against the ICD-10 criteria (International Classification of Diseases, 10th edition) for anxiety and depression (19).

Symptoms of depression during the past week were measured by the Edinburgh Postnatal Depression Scale (EPDS) (20,21). The EPDS is a 10-item self-rating scale designed to identify symptoms of depression after delivery. The scoring of each item ranges from 0 (absence of symptoms) to 3 (maximum severity of symptoms) (20); thus, the sum EPDS score ranges from 0 to 30. In the data analyses, depression was defined as  $EPDS \text{ score} \geq 12$  (20,21). The scale has been validated for detection of major and minor depression in pregnant women (22), in postpartum women (20) as well as in nonpostpartum women (21). The Norwegian version of the EPDS has been validated against the DSM-IV criteria (Diagnostic and Statistical Manual of Mental Disorders, fourth edition) for major depression (23).

All women asked to participate were given written information explaining the purpose of the study and that participation was voluntary. Informed consent was obtained from all participants. The study was approved by the Regional Committee for Ethics in Medical Research in Norway, approval number S-08013a.

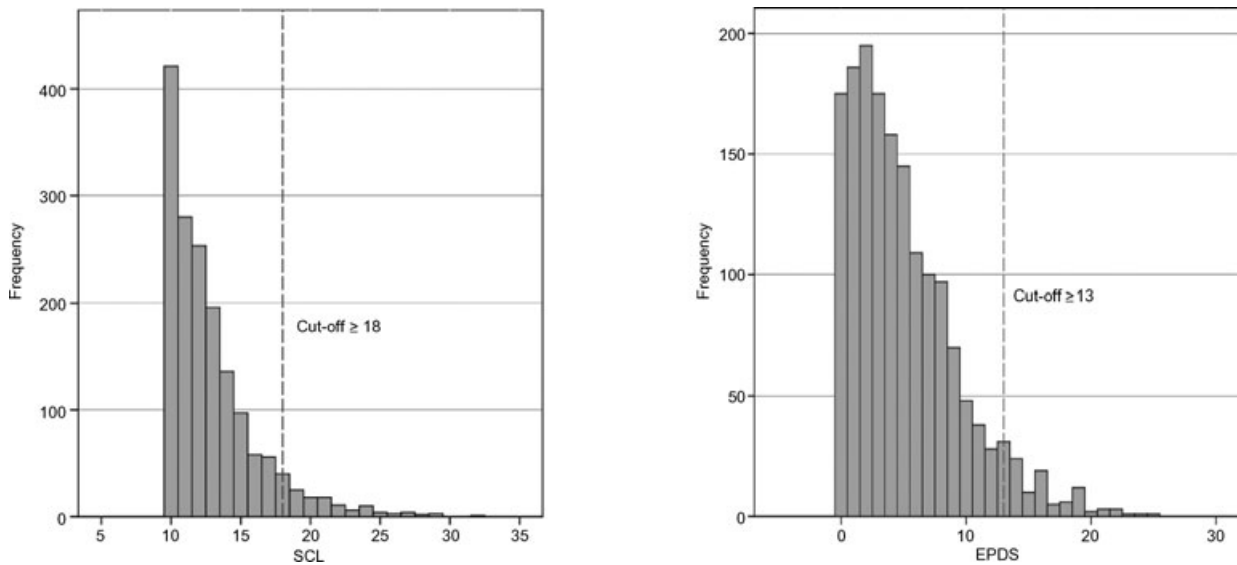
## Statistical methods

The prevalence (%) of fear of childbirth, anxiety and depression was calculated. Cronbach's  $\alpha$  was used to estimate internal consistency within the psychometric instruments. The correlations of anxiety and depression with fear of childbirth, using continuous scales, were estimated by Spearman's rank correlation. Differences in the prevalence of fear of childbirth according to presence of anxiety or depression were tested by chi-squared test, using cut-off values as described above. In addition, we estimated the associations of anxiety and depression with fear of childbirth as odds ratios (ORs) with 95% confidence intervals (CIs).

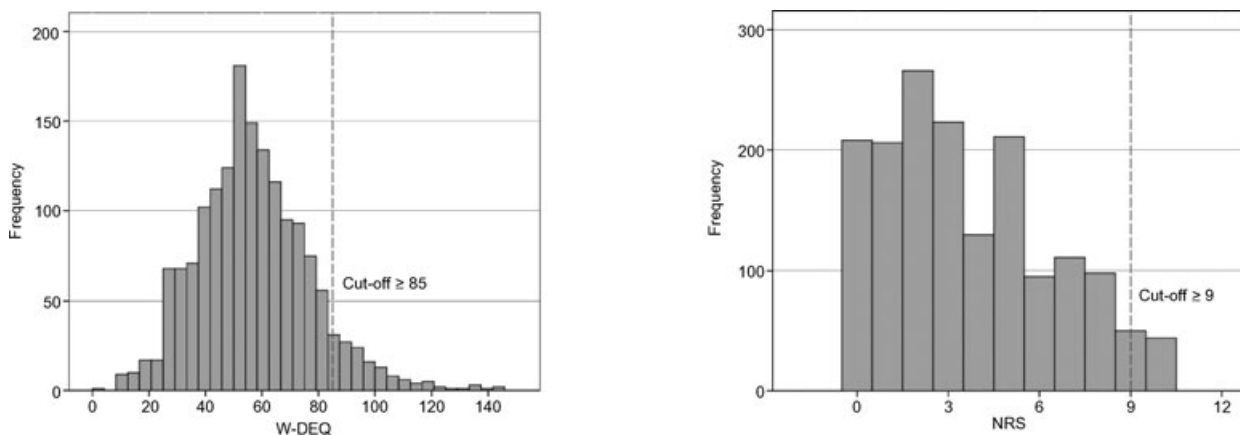
## Results

Among the 1642 women in our study, there was a moderate correlation with fear of childbirth, as measured with the W-DEQ, with the SCL-anxiety scores and the EPDS scores (Spearman's correlation 0.34 and 0.38, respectively). Likewise, fear of childbirth, as measured with the NRS, was moderately correlated with the SCL-anxiety scores and the EPDS scores (Spearman's correlation 0.29 for both). The correlation between the NRS and the W-DEQ was 0.57 (Spearman correlation).

The internal consistencies of similar questions within the scales were high (0.91 for W-DEQ, 0.77 for SCL-anxiety and 0.82 for EPDS, Cronbach's  $\alpha$ ). Skewed distributions of the



**Figure 1.** Distribution of the SCL-anxiety (the first 10 items in the SCL-25) and Edinburgh Postnatal Depression Scale (EPDS) scores among 1642 pregnant Norwegian women.

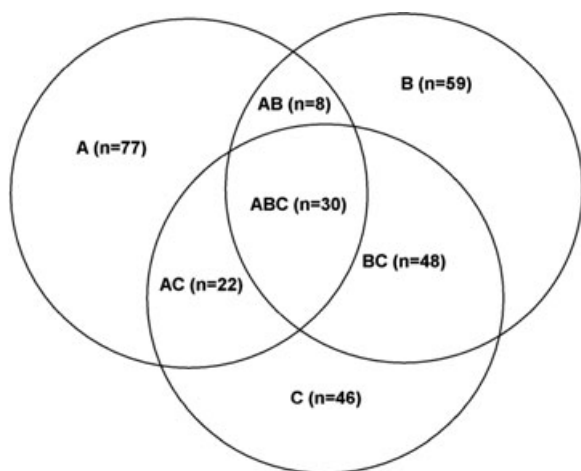


**Figure 2.** Distribution of the Wijma Delivery Expectancy Questionnaire (W-DEQ) and numeric rating scale (NRS) scores among 1642 pregnant Norwegian women.

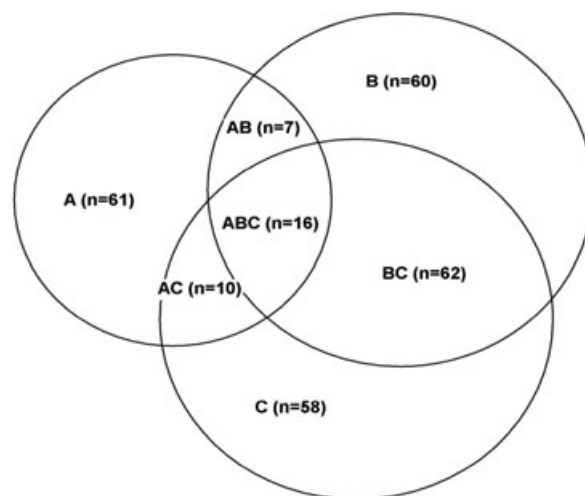
scores were found for the SCL-anxiety scale and for the EPDS (Figure 1), whereas the W-DEQ scores were normally distributed (Figure 2). The mean W-DEQ score was 56.8 (SD 20.1), and the mean NRS score was 3.7 (SD 2.7). The mean SCL-anxiety score and EPDS score were 12.9 (SD 3.2) and 5.1 (SD 4.3), respectively.

Eight per cent (137 of 1642) of the women reported fear of childbirth, defined as W-DEQ score  $\geq 85$ , and 6% (94 of 1642) of the women had fear of childbirth using NRS score  $\geq 9$  as the definition. The prevalence of anxiety (SCL-anxiety score  $\geq 18$ ) was 8.8% (145 of 1642), and the prevalence of depression (EPDS score  $\geq 12$ ) was 8.9% (146 of 1642). Five per cent (78 of 1642) of the women reported both anxiety and depression.

In women with fear of childbirth, as measured with the W-DEQ, 56.2% (77 of 137) had neither anxiety nor depression (Figure 3). Also, when NRS was used to measure fear of childbirth, most of the women who feared childbirth (64.9%, 61 of 94) had neither anxiety nor depression (Figure 4). However, presence of anxiety or depression increased the prevalence of fear of childbirth (W-DEQ  $\geq 85$ ), and fear of childbirth was reported by 12% (8 of 67) of the women with anxiety only, by 32% (22 of 68) of the women with depression only, and by 38% (30 of 78) of the women with anxiety and depression combined (Table 1). The odds ratio of fear of childbirth was 2.4 (95% CI 1.1–5.2) for anxiety, and it was 8.4 (95% CI 4.8–14.7) for depression. The odds ratio of fear of childbirth for women with both anxiety and depression was 11.0 (95%



**Figure 3.** The number of women with fear of childbirth as measured by the W-DEQ (A), anxiety (B) and depression (C) among 1642 pregnant women.



**Figure 4.** The number of women with fear of childbirth as measured by a numeric rating scale (A), anxiety (B) and depression (C) among 1642 pregnant women.

CI 6.6–18.3). Also, when using  $NRS \geq 9$  as the outcome measure, the odds ratio estimate of having fear of childbirth was higher for depression than for anxiety (Table 1).

### Discussion

In this study of 1642 pregnant women, 8% reported fear of childbirth as measured by the W-DEQ. The majority of the women with fear of childbirth had neither anxiety nor depression. However, presence of anxiety or depression was associated with increased prevalence of fear of childbirth, and fear of childbirth was reported by 12% of the women with anxiety only, by 32% of the women with depression only, and by 38% of the women with anxiety and depression combined. Presence of fear of childbirth, as measured by a numeric rating scale, had similar associations to anxiety and depression.

Our study exhibits some limitations. Possible skewed selection to participation may have caused erroneous prevalence

estimates. It is, however, unlikely that a possible skewed selection may have biased the estimated direction of the associations between anxiety and depression with fear of childbirth. The EPDS and SCL-anxiety scale are screening instruments used for identification of women with probable depression or anxiety. The scales are not diagnostic instruments, and a clinical interview remains the gold standard for diagnosing mental illness. When using the EPDS as a screening instrument for depression, a cut-off value of 10 has been recommended (20). We used a higher cut-off ( $EPDS \geq 12$ ) to increase the specificity (24). Also, we used a high cut-off value for the SCL-anxiety scale ( $SCL\text{-}anxiety \geq 18$ ) to increase the specificity for anxiety (19). In supplementary data analyses, we used lower cut-off levels for the EPDS (cut-off  $\geq 10$ ) and the SCL-anxiety scale (cut-off  $\geq 16$ ); however, the associations of anxiety and depression with fear of childbirth remained almost unchanged (data not shown).

**Table 1.** Odds ratios (ORs) with 95% confidence intervals (CIs) for fear of childbirth according to anxiety (SCL-score  $\geq 18$ ), depression (EPDS-score  $\geq 12$ ) and both anxiety and depression (SCL-score  $\geq 18$  and EPDS  $\geq 12$ ) among 1642 pregnant Norwegian women.

	Fear of childbirth (W-DEQ)			Fear of childbirth (NRS)		
	High score ( $\geq 85$ ) n (%)	Low score ( $< 85$ ) n (%)	OR (95% CI)	High score ( $\geq 9$ ) n (%)	Low score ( $< 9$ ) n (%)	OR (95% CI)
No mental impairment	77 (5.4)	1352 (94.6)	1.0	61 (4.3)	1368 (95.7)	1.0
Anxiety only	8 (11.9)	59 (88.1)	2.4 (1.1–5.2)*	7 (10.4)	60 (89.6)	2.6 (1.1–6.0)*
Depression only	22 (32.4)	46 (67.6)	8.4 (4.8–14.7)***	10 (14.7)	58 (85.3)	3.9 (1.9–7.9)***
Both anxiety and depression	30 (38.5)	48 (61.5)	11.0 (6.6–18.3)***	16 (20.5)	62 (79.5)	5.8 (3.2–10.6)***

\* $p < 0.05$ , \*\* $p < 0.01$  and \*\*\* $p < 0.001$ .

Moderate overlap between anxiety and fear of childbirth has been shown in two previous studies (4,25). In these studies, approximately 30% of the eligible women participated, thus few women were included, 230 (4) and 424 women (25), respectively. In addition, fear of childbirth was measured by nonvalidated instruments, and differentiations between symptoms of anxiety and depression were not made (4). In contrast, a third study of 110 women reported a high positive correlation (0.57) between anxiety, as measured with the State Trait Anxiety Inventory, and fear of childbirth, as measured with the W-DEQ (6). Hence, previous studies have reported different degrees of overlap between anxiety and fear of childbirth.

Two previous studies have differentiated the association of depression and anxiety with fear of childbirth within the same study (3,9). A Danish study of 30 480 first-time mothers reported symptoms of anxiety in pregnancy to be associated with an almost fivefold increase in the prevalence of fear of childbirth, and symptoms of depression gave more than a twofold increase (9); however, symptoms of anxiety and depression were based on two nonvalidated questions only. Also, fear of childbirth was assessed by one question only. The association of depression and anxiety combined with fear of childbirth was not addressed, and the response rate in the study was 30%. Also, in a study that included 278 women, anxiety (measured by the neuroticism-, vulnerability- and anxiety-subcales of the NEO-Personality Inventory) had a stronger association with fear of childbirth than depression (5). Comparisons between studies are, however, difficult because different questions and rating scales have been used for measuring fear of childbirth, anxiety and depression.

In order to improve the clinical approach to women who fear childbirth, better understanding of such fear is necessary. Our results suggest an increased prevalence of fear of childbirth in women with anxiety, but in particular, women with depression or with depression and anxiety combined seem to fear childbirth.

Several factors associated with fear of childbirth have been identified (5,26–28). In particular, adverse obstetric experience has been related to fear of childbirth in women with a previous delivery (13,29); hence, anxiety and depression in a subsequent pregnancy may be associated with previous obstetric experience. It may therefore be claimed that we should have made adjustment for obstetric experience when studying the association of anxiety and depression with fear of childbirth. However, our study attempts to answer the clinical question, if my patient fears childbirth, what is the likelihood that she also has anxiety or depression? The likelihood of presence of depression or anxiety after adjustment for other factors was not addressed in our study, and such a measure may not be clinically relevant. However, in understanding the nature of fear of childbirth, the independent association of anxiety and depression after adjustment for

other risk factors could be further explored, and our results should encourage such studies.

Our results suggest that anxiety is less linked to fear of childbirth than depression. This finding may be explained by the fact that W-DEQ includes more items on symptoms of depression than anxiety (12). However, by using the NRS also, we estimated a stronger association of depression than of anxiety with fear of childbirth, and the NRS is not constructed of several subscales. Recent research suggests that the prevalence of depressive symptoms during pregnancy is very constant, and similar to that of the postpartum period (3,30), whereas symptoms of anxiety appear to be more common at the end of pregnancy (31). Hence, as some researchers have postulated, fear of childbirth may be a sign of hidden depression (3).

The W-DEQ is currently the most frequently used instrument to measure fear of childbirth. The W-DEQ is found to be valid and reliable (12,25,32) and to have psychometric properties that exceed that of a single question; however, the W-DEQ is a comprehensive instrument and is therefore time consuming to use. We therefore wanted to compare an NRS with the W-DEQ for measuring fear of childbirth. Such one-item scales have been reliable and valid tools in the measurement of pain, mood and other subjective feelings (33), and have previously been used to measure fear of childbirth (32). The correlation between NRS and the W-DEQ was relatively high in our study. Thus, use of NRS may promote high compliance in studies and may, for some purposes, replace the W-DEQ.

In this population study of 1642 pregnant women, the majority of women with fear of childbirth had neither anxiety nor depression; however, presence of anxiety or depression increased the prevalence of fear of childbirth. In particular, women with both these conditions did fear childbirth. Hence, anxiety and/or depression may be the most prominent health problem for some of the women. Such knowledge is important in order to improve the clinical approach to women who fear childbirth.

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