Anxiety in early pregnancy: Prevalence and contributing factors

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Anxiety in early pregnancy: Prevalence and associated factors

Abstract

Antenatal anxiety symptoms are not only a health problem for the expectant mother. Research has found that maternal anxiety may also have an impact on the developing baby. Therefore, it is important to estimate the prevalence of maternal anxiety and associated factors. The current study aims to estimate the prevalence of anxiety symptoms during the first trimester of pregnancy and to identify associated risk factors. Secondly, to investigate other factors associated with anxiety during early pregnancy including fear of childbirth and a preference for caesarean section. In a population based community sample of 1,175 pregnant women, 916 women (78 %) was investigated in the first trimester (gestation week 8-12). The Hospital Anxiety Depression Scale HADS-A was used to measure anxiety symptoms. The prevalence of anxiety symptoms, HADS-A scores ≥ 8 during pregnancy, was 15.6 percent in early pregnancy. Women under twenty-five years of age were at an increased risk of anxiety symptoms during early pregnancy (OR: 2.6, CI: 1.7-4.0). Women who reported a language other than Swedish as their native language (OR: 4.2, CI: 2.7 - 7.0), reported high school as their highest level of education (OR: 1.6, CI: 1.1 – 2.3), were unemployed (OR: 3.5, CI: 2.1 – 5.8), used nicotine before pregnancy (OR: 1.7, CI: 1.1 – 2.5) and had a self reported psychiatric history of either depression (OR: 3.8, CI: 2.6 - 5.6) or anxiety (OR: 5.2, CI: 3.5 – 7.9) before their current pregnancy, were all at an increased risk of anxiety symptoms during early pregnancy. Anxiety symptoms during pregnancy increased the rate of fear of birth (OR: 3.0, CI: 1.9 - 4.7) and a preference for caesarean section (OR: 1.7, CI: 1.0 - 2.8). Caregivers should pay careful attention to history of mental illness to be able to identify women with symptoms of anxiety during early pregnancy. When presenting with symptoms of anxiety the women might need counseling and or treatment in order to decrease her anxiety.

Keywords: Pregnancy; anxiety; anxiety disorder; Hospital Anxiety and Depression Scale

Introduction

Around 3-17 percent of women suffer from depressive illness during pregnancy (Andersson et al., 2003a; Josefsson et al., 2001; Leight et al., 2010; Rubertsson et al., 2005). Depression may have negative effects on a women's social and personal adjustment, marital relationship, and mother-infant interaction. Emerging research has also shown that depression during pregnancy also constitutes a risk factor for adverse obstetric outcomes such as preterm birth and postpartum depression (Adler et al., 2007; Goedhard et al., 2010; Larsson et al., 2004; Li et al., 2009; Wisner et al., 2009). Anxiety disorders during pregnancy have received less research attention.

A Swedish study establishes that 40 percent of the women reported moderate or extreme symptoms of anxiety and depression when investigated with the EQ-5D ((EuroQoL-5 Dimensions) (5th question)). The highest frequency was reported in the childbearing age group of 18-29 years (Molarius et al., 2009). Other studies have reported prevalence of anxiety in both the general population and in a pregnant sample of between 6.6 – 10.4 percent (Andersson et al, 2003b; Berle et al., 2005; Lisspers et al., 1997).

Significant associations have been found between anxiety and/or depression and physical health during pregnancy. Physical attributes include increased nausea and vomiting (Andersson et al., 2003) and a higher risk for preeclampsia have been found in women with mood- and anxiety disorders before or during pregnancy (Kurki et al., 2000; Qui, et al., 2009). The amount of sick leave reported during pregnancy was also significant higher when women reported they suffered from anxiety and/or depression (Andersson et al., 2003 b). Women with antenatal anxiety and/or depression were more likely to have taken their first sick-leave day during the first trimester as compared with women without mental disorders (Andersson et al., 2003b). A connection between antenatal anxiety and postnatal depression has also been reported (Heron et al., 2004; Austin, et al., 2007; Martini et al., 2010).

Andersson et al. (2003b) found that woman suffering from anxiety and/or depression during pregnancy made significantly more visits to an obstetrician. The visits were more often related to fear of childbirth and a preference for an elective caesarean section (Andersson 2003b). Fear of childbirth has been pointed out as one of the strongest factors for pregnant women to have a preference for an elective caesarean section (Kringeland et al., 2009).

Anxiety during pregnancy has been reported as a risk factor for the baby (Alder et al., 2007). In a Norwegian study based on HADS-A, lower Apgar score (<8) at one and five minutes afterbirth were found if the mother reported anxiety symptoms during pregnancy (Berle et al., 2005). Antenatal anxiety symptoms also had an association to lower foetal growth during the 20-22 gestation weeks (Conde et al., 2010) and significantly pre-term birth (Ross et al., 2006). Even after adjusting for sociodemographic factors, Copper et al. (1996) found that maternal stress could lead to spontaneous preterm birth and low birth weight.

Research has investigated the association of maternal anxiety disorders during pregnancy and its transmission of anxiety disorders from mother to offspring (Martini et al., 2010). A Belgian/ Dutch study highlights that excessive anxiety in early pregnancy may affect the fetal brain and constitute a risk of impulsivity and cognitive disorders at 14- and 15 years of age (Van den Berg et al., 2005). It has also emerged that high antenatal maternal anxiety at 12 and 22 weeks of pregnancy could be a significant factor in the development of ADHD symptoms, externalizing problems and anxiety in 8- and 9 year olds (Van den Bergh & Marcoen, 2004). The link between antenatal anxiety and behavioural/ emotional problems of the child at 4-years of age have been reported by O'Connor et al. (2002).

In Sweden, the free access to antenatal care enables enrollment with almost 100 percent of pregnant women. This provides a good opportunity to identify women with health problems. However, research has shown that many women with a mental illness still go undiagnosed and consequently untreated during their obstetric care (Andersson et al., 2003; Vesga-López 2008). Research from America has highlighted the limitations within the obstetrics system. The system often fails to recognize and detect mental illness, such as anxiety symptoms (Goodman et al., 2010). Obstetricians have shown moderate interest in screening patients for anxiety during pregnancy, and less interest in the initiation of treatment (Coleman et al., 2008). Interestingly, a self reported history of an anxiety disorder before pregnancy has been shown to be a significant risk factor for the development of postnatal anxiety or depression, greater than a history of a depressive disorder (Matthey et al., 2003). In summary, there is a need for investigation of the factors that contribute to the presence of anxiety during the first trimester of pregnancy specifically, and the subsequent impact this anxiety has on the experience of pregnancy and birth. This study is an extension of that of Andersson et al (2003) and Kringeland et al (2009) as

it is primarily focussing on the prevalence of anxiety during pregnancy and is not focussed on the birth outcome. The findings of this study empowers the caregivers in antenatal care to be aware of the factors that are associated with the development of anxiety during pregnancy, and intervien where appropriate.

The aims of the current study were to estimate the prevalence of anxiety symptoms during the first trimester of pregnancy, and to investigate the association of anxiety and fear of childbirth and a preference for caesarean section.

Material and methods

Participants and Procedures

This study is part of the BETTI study aiming to investigate women's mental health during pregnancy. All twenty-five antenatal care clinics (ACC) operating in a county of mid-Sweden with ten communities and approximately 250,000 inhabitants were invited to recruit Swedish-speaking women at their first antenatal visit in early pregnancy between June 2008 and June 2009. The respondents were recruited by their midwives and consented to participate by signing a document with their personal code and contact details. Participant recruitment was performed in four steps including: a) Oral information about the study by the antenatal care midwife, b) Written information in a booklet, c) A signing form separate from the information, and d) A final check by the midwife if the respondents were literate with the Swedish language (which means both reading and oral skills). Out of 1,548 participants recruited during the study period, 1,218 signed the informed consent form. The respondents could complete the questionnaire at the ACC or choose to return it to the study administration by a prepaid envelope. The questionnaire was distributed in gestation week 8 - 12 to those who chose to participate. The attrition analyses showed that eight respondents moved, thirty-three had an early miscarriage, and two had an induced abortion. This resulted in 1,175 respondents being eligible to answer the questionnaire and 916 (78 %) did. The participants were representative of the total population in terms of mean age for first time pregnancy (27.4 versus 27.5 years old (Data from National Board of Health and Welfare) in Sweden.

Ethics

Researches Ethic Committee at Uppsala University gave ethical approval. The women's choice to participate or not did not affect her care. All respondents were informed that participating was voluntary and that they could leave voluntarily at anytime without reason. All who chose to participate had to give their written consent. They were also provided with the contact information for members within the research team. All data was de-identified and only the research team was able to link the data with each respondent's antenatal- and birth record.

Statistical analyses

The questionnaire included questions about sociodemographic and obstetric background, history of depression and anxiety. Respondents were asked to provide details of their age, education level, marital status, tobacco use and any previous birth experience (vaginal, assisted vaginal, planned caesarean and emergency caesarean section). They were also asked to rate their current feelings about the approaching birth using a five point scale (1= very positive to 5= very negative). The participants who stated "both positive and negative" were excluded in this calculation due to difficulties to categorize fairly.

The participants were asked to indicate their preferred mode of delivery (vaginal or caesarean section) and comment on a statement about fear of childbirth. "Fear of childbirth exists in both men and women. To what extent do you feel it right now?" The options were "not at all", "little", "much" and "very much". A history of mental illness was investigated by the inclusion of the following self-reporting question: "Do you have, or have you had any mental disorders". The respondents could answer yes or no in relation to history of depression and anxiety... Furthermore, a stepwise modeling of the statistically significant variables from the previous analyses were entered in blocks with the outcome variable total HADS-A score. The factors thought to have an impact on anxiety during pregnancy, and investigated, included having a history of anxiety, age (less than 24), country of origin, fear of birth, feelings about birth and marital status. The analyses were conducted using SPSS, version 17 for Windows. The results from this analysis are presented as Odds ratio (OR) with confidence interval (CI).

Measures

HADS. Ongoing sign of anxiety symptoms were investigated with the HADS-A

(Hospital Anxiety- and Depression Rating Scale- Anxiety). HADS is a self – rating questionnaire with fourteen questions. It consists of two subscales: seven items assess symptoms of depression (HADS-D) and seven items assess symptoms of anxiety (HADS-A). Each question is assigned a possible scores (0-3), which means that minimum score is 0 (no suspected pathology) and maximum score is 21 (maximum suspected pathology) per subscale. The HADS-A was originally developed by Zigmond and Snaith (1983) to support non psychiatric hospital clinics to detect anxiety and depression in patients. The developers have suggested scores ranging from 0-7 are to be considered normal, 8-10 as cause for concern and 11-21 as possible clinical case requiring assessment. The HADS sensitivity according to DSM-IV (American Psychiatric Association, 2000) defined anxiety disorders have been confirmed in a review (Bjelland et al., 2001). It has also been validated for use in the primary care setting (Bjelland et al., 2001). The Swedish version of the HADS has been evaluated with valid results by Lisspers et al. (1997). Within the literature, the application of the HADS tool varies widely between sample populations, and the tool has not been used in a population of pregnant women until recently (Matthey and Ross-Hamid, 2012). The matter of which cut-off point to use is topical, with two commonly used cut-off scores reported: 8 or more for mild levels of anxiety and 11 or more for more moderate probable anxiety. In this study the cases (≥ 8) of HADS- A are investigated in different contexts.

Results

Sample characteristics

The demographic characteristics of the 916 respondents were: mean age 29 (16-43). Scandinavian participants were 853 (92.6%). 881 (96. 2%) of respondents were married or living with a partner, 21 (2.3%) respondents had a partner but were not living together and 14 (1.5%) were single. The majority of respondents 405 (44.3%) had their highest level of education at high school, followed by education at university for over three years; 306 (33.5%). 164 (17.9%) respondents were educated at university for less than three years and 38 (4.2%) of respondents had their highest education level at elementary school. Smoking during current pregnancy was reported in 56 respondents (6.1%) and 14 (1.5%) reported snuffing during their current

pregnancy.

HADS - A results

The total number of women with a possible clinical case of anxiety (HADS-A score ≥ 8) was 143 (15.6%) (Figure 1).

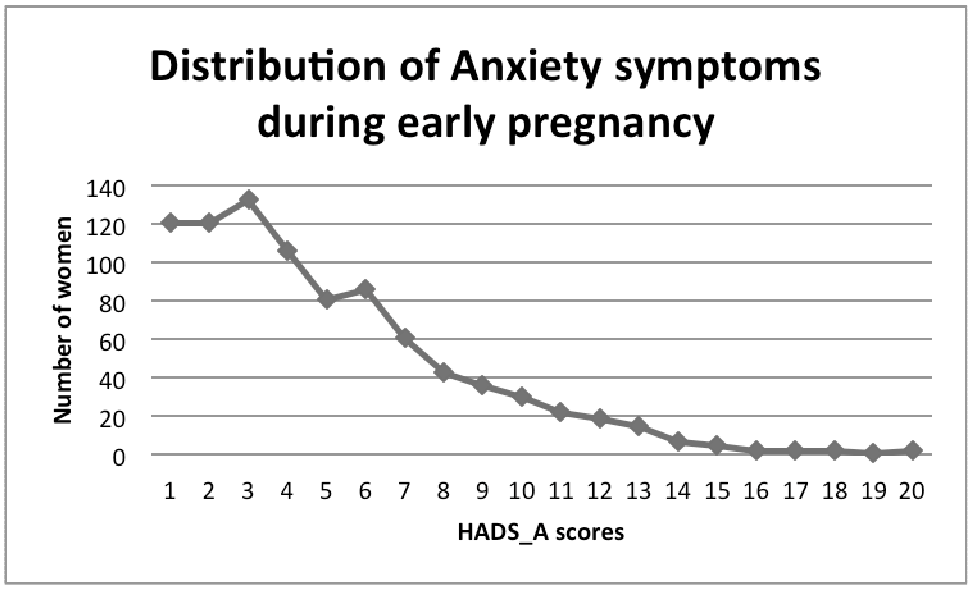

Figure 1: The distribution of anxiety symptoms during early pregnancy

When considering the cut-off point of HADS-A ≥ 8, or the cases where clinically there is a cause for concern, there are a number of factors that influence the likelihood an expectant mother will experience anxiety during early pregnancy (Table 1). Women under twenty-five years of age were at an increased risk of heightened anxiety during early pregnancy (OR: 2.6, CI: 1.7-4.0). Women who reported a language other than Swedish as their native language (OR: 4.2, CI: 2.7 - 7.0), reported high school as their highest level of education (OR: 1.6, CI: 1.1 – 2.3), were unemployed (OR: 3.5, CI: 2.1 – 5.8), used nicotine before pregnancy (OR: 1.7, CI: 1.1 – 2.5) and had a self reported psychiatric history of either depression (OR: 3.8, CI: 2.6 - 5.6) or anxiety (OR: 5.2, CI: 3.5 – 7.9) before their current pregnancy, were all at an increased risk of heightened anxiety during early pregnancy.

Table 1: Anxiety symptoms in early pregnancy in relation to demographics and self reported mental illness

	HADS-A ≤ 7 n = 773 n (%)	HADS-A ≥ 8 n = 143 n (%)	Odds Ratios for HADS-A ≥ 8 OR	 CI
Age (n = 912)				
25-35	661 (85.8)	99 (69.7)	1.0	Reference
<25	109 (14.2)	43 (30.3)	2.6	1.7 – 4.0
Native Language (n=916)				
Swedish	732 (94.7)	116 (81.1)	1.0	Reference
Other	41 (5.3)	27 (18.9)	4.2	2.5 – 7.0
Education (n = 912)				
College or University	411 (53.4)	59 (41.5)	1.0	Reference
High School	359 (46.6)	83 (58.5)	1.6	1.1 – 2.3
Unemployment (n = 908)				
Employed	694 (92.8)	106 (78.5)	1.0	Reference
Unemployed	54 (7.2)	29 (21.5)	3.5	2.1 – 5.8
Nicotine use before pregnancy (n=916)				
No	607 (78.5)	98 (68.5)	1.0	Reference
Yes	166 (21.5)	45 (31.5)	1.7	1.1 – 2.5
Depression (history of; n = 894)				
No	635 (83.9)	79 (57.7)	1.0	Reference
Yes	122 (16.1)	58 (42.3)	3.8	2.6 – 5.6
Anxiety (history of; n = 910)				
No	672 (88.9)	83 (60.6)	1.0	Reference
Yes	84 (11.1)	54 (39.4)	5.2	3.5 – 7.9

Feelings about the approaching birth

Women classified with a possible clinical case of anxiety according to HADS-A (HADS-A score ≥ 8) had a greater occurrence of negative thoughts about the upcoming delivery (OR: 2.7, CI: 1.2 - 5.9) and they also show more fear of birth (OR: 3.0, CI: 1.9 - 4.7). Women with cases of anxiety symptoms according to HADS-A indicated a higher prevalence of preference for a planned caesarean section (OR: 1.7, CI: 1.0-2.8) (Table 2).

Table 2. Anxiety symptoms in early pregnancy in relation to approaching birth, preference

regarding mode of delivery and fear of giving birth

		HADS-A ≤ 7	HADS-A ≥ 8	Odds Ratios for	
		n = 773	n = 143	HADS-A ≥ 8	
		n (%)	n (%)	OR	CI
How do you feel about the approaching birth?	n = 528				
Positive		440 (93.4)	48 (84.2)	1.0	Reference
Negative		31 (6.6)	9 (15.8)	2.7	1.2 - 5.9
Preference re mode of giving birth	n = 888				
Vaginal delivery		677 (90.4)	118 (84.9)	1.0	Reference
Caesarean section		72 (9.6)	21 (15.1)	1.7	1.0 – 2.8
Fear of giving birth	n = 914				
Not at all/Somewhat		701 (90.8)	109 (76.8)	1.0	Reference
A great deal/Very much		71 (9.2)	33 (23.2)	3.0	1.9 – 4.7

In order to test the unique contribution of the factors identified as being associated with anxiety a multiple regression analysis was conducted with the total clinical anxiety score in early pregnancy as the criterion variable and age, level of education, employment status, history of anxiety and depression, feelings toward the approaching birth, preferred mode of delivery and fear of birth were defined as predictor variables. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Multiple regression was used as it is able to predict, unique, relative and joint influences of the predictor variables on the criterion variable. The predictors entered into this model explained a proportion of 16%; R = .39 of variance in HADS-A scores, $F(9, 610) = 12.46$, $p < .0005$.

The contribution each predictor variable makes on the model of interest. Having a history of anxiety makes the largest unique contribution to the relationship with anxiety during early pregnancy ($\beta = .171$, $p < .001$). Age ($\beta = .138$, $p < .001$), feelings about the approaching birth ($\beta = .130$, $p = .006$) and fear of birth ($\beta = .121$, $p < .01$) all make statistically significant, unique and meaningful contributions to the impact of anxiety during early pregnancy.

Discussion

The findings from this study indicate anxiety is a common illness among pregnant women, and

the illness overtakes depression in terms of prevalence in early pregnancy. This fact, and the emerging consequences of experiencing anxiety during pregnancy on both mother and baby, as well as the possible impact on the birthing experience and birth outcome, warrants investigation into the factors that are associated with anxiety during early pregnancy.

Prevalence of anxiety

This is the first time that the HADS-A has been used on a pregnant population in Sweden. This study shows that cases of anxiety in pregnant women during the first trimester occurred in 15.6 percent of our sample. This result is almost double that observed in previous studies. Lisspers et al. (1997) found an overall incidence (in both men and women) of anxiety symptoms, measured with HADS-A, of 8 percent in a Swedish sample. A Norwegian study, using HADS-A in all three trimesters of pregnancy, reported a total frequency of anxiety disorders of 10.4 percent (HADS-A $\geq$8) (Berle et al., 2005).

The presumed advantage of using the HADS-A in pregnancy is that the scale does not have any questions on physical symptoms such as fatigue, pain, dizziness etc – which could be common in pregnancy as well as during mental stress. Thus the risk of false indications of anxiety during pregnancy is minimized.

Associated factors

In this study prevalence of a moderate score ($\geq$ 8) on the HADS-A during pregnancy was associated with negative thoughts about the upcoming birth (OR: 2.7, CI: 1.2-5.9), pronounced fear of birth (OR: 3.0, CI: 1.9-4.7) and a greater prevalence of preference to have a planned caesarean section (OR: 1.7, CI: 1.0-3.3). This is in line with previous research, which had pointed out fear of giving birth as one of the strongest background factors for women to have a preference for a planned caesarean section (Kringeland et al., 2003). Sjögren & Thomassens (1997) reported that 68 percent of women referred to a psychosomatic outpatient clinic due to severe fear of childbirth initially requested a planned caesarean section. The prevalence of a pre-existing mental illness, such as depressive- and panic disorders and psychotic episodes, was significantly higher in the investigated group compared to the control group with no fear of childbirth (Sjögren & Thomassen, 1997).

Andersson et al. (2003b) using the PRIME-MD (Primary Care Evolution of Mental Disorders) found that the prevalence of anxiety disorders, in a sample of pregnant women in their second trimester, occurred in 6.6 percent. It can be hypnotized that women in early pregnancy i.e. first trimester are more likely to be more worried/ anxious than in second and third trimester. In the beginning of pregnancy the women has to adjust to pregnancy, ensure the acceptance of the baby and cope with physical symptoms such as nausea, morning sickness and other pregnancy related symptoms which may be acclimatized over time.

Using the EQ-5D in a Swedish sample, Molarius et al. (2009) found that 40 percent of the women stated they felt moderately or extremely anxious or depressed. The EQ-5D, contains the self- reporting statement: “Please indicate which statements best describe your own health state today: Anxiety/ Depression”. The answer options are: “I am not anxious or depressed, I am moderately anxious or depressed, and I am extremely anxious or depressed”. Irrespective of the fact that the self reporting statement screens for both depression and anxiety, the resulting prevalence is an extremely high figure. This highlights the importance of a validated screening instrument. The clinical meaning of the concepts "anxiety" and "depression" according to DSM-IV may not be the same as acknowledged in general. Furthermore it is important to point out that language differences can make international screening tools differ. The English version of EQ-5D uses the words "anxious/depressed" while the Swedish version uses words that can best be translated as "worried/in low mood". One of the most important points from an obstetrical view, was articulated by Molarius et al. where the highest frequency of self reported anxiety/depression was found in women in the childbearing age group of 18-29 years. It can be assumed that a certain amount of anxiety is a normal reaction of pregnancy and upcoming delivery - even for mentally healthy women, since it is an important transition period in one’s life. It is reasonable to suppose that women, who suffer from anxiety or other mental illness before pregnancy, are at increased risk to experience pregnancy and childbirth as especially negative and stressful.

Pregnant women screened with depressive symptoms according to EPDS (Edinburgh Postnatal Depression Scale) (scores>14)) were more likely to have a preference for planned caesarean section (Hildingsson et al. 2002). Andersson et al., (2003) have found that almost twice as many pregnant women with any psychiatric diagnosis had pronounced fear of childbirth, compared with those who not had any mental disorder. Women with any psychiatric diagnosis

visited their obstetrician more often. These visits were more often related to fear of childbirth and preference for a planned caesarean section. These groups of women were in fact more likely to have given birth by caesarean section (Andersson et al., 2003). Abnormal symptoms of anxiety are often perceived as distress and perceived distress is quite possible without clinical diagnosis. Hildingsson et al. (2002) found out that not only did specific worry about childbirth influence the likelihood the women would deliver by a planned caesarean section, but worry generally also contributed to this outcome. but also general worry for other things in life.

This study has demonstrated that anxiety during pregnancy is strongly associated with a previous history of anxiety at some point in a women's life. Indeed, a history of anxiety is the strongest contributing factor to anxiety during pregnancy. In addition, the age of the mother, particularly younger mothers were also found to be more likely to suffer from anxiety during early pregnancy. Feelings about the approaching birth and having a fear of birth may also influence the development of anxiety during early pregnancy. Clinically, each of these factors should be investigated, and where appropriate, referral to a mental health professional should be considered. Interestingly, no association between anxiety and previous obstetric history was identified. This would suggest that the development of anxiety within early pregnancy can impact women irrespective of number of children.

Strength of the study

The results of this study are consistent with previous research according to the prevalence of anxiety symptoms. Respondents have also been found to be a representative sample of the Swedish general population when controlling for background factors such as maternal age, socioeconomic status, the prevalence of reported mental illness and disorders etc. There were 916 respondents, with a response rate of 78 percent.

Limitations of the study

Only Swedish-speaking respondents were invited to participate in the study. Previous mental illness was investigated by a self-assessment form. This means that we cannot know if there is an actual clinical diagnosis.

Future research

Future research into other associated risk factors, such as outcome data and mode of birth, due to psychosocial and socioeconomically status is required. It is necessary to highlight if the women who were screened for anxiety received any kind of treatment. In this study a history of depression and anxiety was investigated. Other mental disorders such as for example ADHD, personality disorder or Asperger syndrome and there possible impact on caseness of anxiety during pregnancy may be further research.

Clinical implications

This study shows that self-reported mental disorders such as anxiety and depression may be an indicator for obstetrical caregivers, to give attention to detect anxiety symptoms during pregnancy. Anxiety during pregnancy is a stressful condition and negatively impacts women. It is not only an issue for the women but also the foetus and the expected offspring. During antenatal care there is an opportunity to identify symptoms of physical or mental ill health and if needed referral to a specialist for counseling and treatment. Furthermore, anxiety during pregnancy is a risk factor for both post-natal anxiety and post-natal depression, consequently, monitoring and if required treatment in the postpartum period is important to mediate the impact anxiety has on both the mother and her child.

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