

ORIGINAL ARTICLE

Perceived stress and anxiety among Ghanaian pregnant women

A. Boakye-Yiadom¹, S. O. Shittu², J. B. Dutt², P. P. M. Dapare³ and A. Alhassan⁴

¹Department of Community Health, ²Department of Nursing, ³Department of Biomedical Laboratory Science, School of Allied Health Sciences, ⁴Department of Anatomy, School of Medicine and Health Sciences, University for Development Studies, Tamale, Ghana

The aim of the study was to assess the prevalence of stress and anxiety, as well as the association that exists between stress/anxiety and sociodemographic characteristics, among pregnant women at the Tamale West Hospital in Ghana. This study was conducted among 154 pregnant women visiting the Tamale West hospital for antenatal care, from March to May, 2015. All participants were evaluated using a Self-designed semi-structured questionnaire for socio-demographic information, the Center for Epidemiological Studies Depression Scale (CES-D) for stress assessment and State Trait Anxiety Inventory (STAI) for assessment of anxiety. The response rate was 96.3%, with an age range of 17-42. Whereas 43.5% of the studied population were illiterate, 24.0% had attained basic education, 21.4% had attained secondary education while only 11.0% had attained tertiary education. Most of the studied participants were unemployed (57.8%), with a mean \pm s.d. income level of Ghc 103.4 \pm 207.9. Almost all of them were married (96.8%) with mean \pm s.d. marriage duration of 6.2 \pm 4.8 years, mean \pm s.d. number of birth of 1.7 \pm 1.4 as well as mean \pm s.d. gestation week of 21.3 \pm 10.9 weeks. Almost all the pregnant women had no complication in the current pregnancy (99.4%) as well as in their previous pregnancy (96.1%). The mean \pm s.d. of anxiety score as well as stress score from the studied population were 15.3 \pm 3.2 and 13.2 \pm 4.9 respectively. The prevalence of anxiety was 9.7% while that for stress among these studied participants was 28.6%. Higher proportion (26.6%) of educated women had anxiety disorders with a lower (21.9 \pm 10.8) mean gestation period being associated with anxiety disorders. Age was higher (28.1 \pm 5.8; $p=0.0155$) in women with pregnancy specific stress than in normal women (25.0 \pm 7.9). A higher proportion of women who were married (99.1%; 0.0097) were normal as compared to those who had pregnancy stress (90.9%). Mean number of births was seen to be higher among normal women (4.3 \pm 5.9; 0.0054) than those with stress (1.8 \pm 1.4). This study reiterates the rising levels of pregnancy specific stress and anxiety, with social and medical factors such as literacy levels, gestational period, age, marital status and parity playing major roles in the determination of pregnancy related stress and anxiety levels.

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INTRODUCTION

Pregnancy is a special and joyful period of life. It is a time for great responsibilities and emotional attachment for the pregnant women. It is a period of enormous biological, psychological and social challenges for the mother to be and time of significant life change for women and their partners. It can however be a time of emotional and psychological disturbances when dealing with new demands. Studies have

shown that antenatal period is a time of increased liability to mental disorders. The most common psychiatric illnesses during pregnancy and the postpartum period are stress and anxiety disorders (Bödecs *et al.*, 2011). According to Andersson *et al.*, (2004) and Berle *et al.*, (2005), about 10% of pregnant women meet the criteria for anxiety disorders in Sweden and Norway respectively.

Stress and anxiety disorders during pregnancy do not only have negative impacts on the course of the pregnancy, it can also affect its outcome, the development of a child and maternal well-being. It is widely recognised that stress during pregnancy may

Correspondence: A. Boakye-Yiadom, Department of Community Health, School of Allied Health Sciences, University for Development Studies, Tamale, Ghana

affect neuroendocrine development in the foetus and the formation of a secure attachment bond with the newborn and, consequently, the socio-emotional development of the child (Campbell and Cohn, 1997; Jacobsen, 1999). High anxiety during pregnancy has been linked to lower birth weight, shorter birth length, shorter gestations (Hosseini *et al.*, 2009) and increased uterine artery resistance (Teixeira *et al.*, 1999). Anxiety in pregnancy could have long-term effects on children's behavioural/emotional problems (O'Connor *et al.*, 2002).

Prominent sources of stress during pregnancy include changing roles, life change, and relationship difficulties. The psychological consequences of such stress may be amplified by hormonal changes that occur during the course of pregnancy. Studies have also found that partner conflict during pregnancy is related to pregnancy related worries or concerns (Da Costa *et al.*, 1999) and emotional distress (Brown, 1994). Emotional and instrumental support from friends and family and an embedded sense of community help women to cope effectively with stress (Younger *et al.*, 1998).

Despite the reports on how anxiety disorders and psychological distress during pregnancy negatively affect maternal as well as offspring outcomes, valid conclusions from many studies are limited due to differences in the definition and operationalization of outcome variables. Various studies have assessed prevalence and determinants of ante partum anxiety and stress in developed countries, but there is still scarcity of data from developing countries with almost none from Ghana. This study sought to assess the prevalence of stress and anxiety during pregnancy as well as the association that exist between stress/anxiety and socio-demographic characteristics.

MATERIALS AND METHODS

Study Participants

This cross sectional study was conducted among pregnant women 18 years and above, visiting Tamale West Hospital for ANC during the study period. One hundred and fifty four (154) women attending

routine obstetrical care or antenatal care at the Tamale West Hospital, Tamale were approached and encouraged to participate in the study. Participants were recruited prior to undertaking their medical examinations or antenatal classes. Upon giving an informed consent, data on age, educational level, employment, socioeconomic status, marital status, duration of relationship, number of previous children and gestational age were collected. Presences of medical complications in previous and current pregnancies were also recorded. The women were also asked to fill out the Centre for Epidemiologic Studies Depression Scale CES-D and the State Trait Anxiety Inventory STAI.

Stress Data

Emotional distress was assessed using the Kessler Psychological Distress Scale (K10). This is a 10-item questionnaire intended to yield a global measure of distress based on questions about depressive symptoms that a person has experienced in the most recent 4 week period. It has been used as a screening test for depression disorders in medical settings and in numerous studies with pregnant women. The total score ranges from 10 to 50, with higher scores indicating more severe symptoms of Stress (Kessler *et al.*, 2002).

Anxiety Data

State Trait Anxiety Inventory (STAI) is a short self-report instrument composed of two subscales measuring two distinct anxiety concepts, state and trait anxiety. State anxiety is defined as a transitory emotional condition, while trait anxiety refers to a relatively stable proneness of a person to respond with anxiety in different situations. Each scale contains 20 items. Each of the items is rated on a 4 point scale, asking the respondent to evaluate how she feels at a particular moment (state-anxiety) or how she generally feels (trait-anxiety). Higher scores indicate greater levels of state and trait anxiety. Although there is no cut-off score established for STAI, some previous studies used scores of 45 as an indication of high state-anxiety (Teixeira *et al.*, 2009) and trait-anxiety (Austin *et al.*, 2007). In this study, we used the score of 45 to differentiate between anxious and non-anxious groups.

Statistical Analysis

Data was analyzed using Microsoft Excel 2010 and SPSS, version 20. Means and standard deviations were determined for relevant variables. Comparison of categorical variables was done using the chi-square test while continuous variables was compared using the unpaired t-test. Strength of association was assessed using correlation with a 95% confidence interval (CI). In all cases, a p value < 0.05 was considered as significant.

RESULTS

General characteristic of the study population

Out of the total 160 questionnaires that were administered, 155(96.9%) pregnant women returned the questionnaire. The questionnaire from 1 pregnant woman was incomplete, leaving 154 complete and evaluable questionnaires, indicating a response rate of 96.3%. The age range for the responding pregnant women was 17–42 years.

As shown from Table 1, the mean \pm s.d. age of the studied population was 27.9 ± 5.8 years. Whereas 43.5% of the studied population were illiterate, 24.0% had attained basic education, 21.4% had attained secondary education while only 11.0% had attained tertiary education (Table 1). Most of the studied participants were unemployed (57.8%), with a mean \pm s.d. income level of Ghc 103.4 ± 207.9 . Almost all of them were married (96.8%) with mean \pm s.d. marriage duration of 6.2 ± 4.8 years, mean \pm s.d. number of birth of 1.7 ± 1.4 as well as mean \pm s.d. gestation week of 21.3 ± 10.9 weeks. Almost all the pregnant women had no complication in the current pregnancy (99.4%) as well as in their previous pregnancy (96.1%). The mean \pm s.d. of anxiety score as well as stress score from the studied population were 15.3 ± 3.2 and 13.2 ± 4.9 respectively (Table 1).

Prevalence of Stress and Anxiety Disorder

As shown in Figure 1A, 15 participants out of the 154 consented were having some form of anxiety disorder, giving 9.7% prevalence of anxiety disorder. From this, 9.1% (14 out of 154 participants) had mild anxiety disorder, 0.6% (1 out of 154 partici-

Table 1: General characteristic of the studied population

Variables	Total
Age (yrs)	27.9 \pm 5.8
Educational level	
Illiterate	67(43.5%)
Basic	37(24.0%)
Secondary	33(21.4%)
Tertiary	17(11.0%)
Employment	65(42.2%)
Income level (Ghc)	103.4 \pm 207.9
Married	149(96.8%)
Duration of marriage (yrs)	6.2 \pm 4.8
Number of birth	1.7 \pm 1.4
Gestational age	21.3 \pm 10.9
No complication	
Current pregnancy	153(99.4%)
Previous pregnancy	148(96.1%)
Anxiety score	15.3 \pm 3.2
Stress score	13.2 \pm 4.9

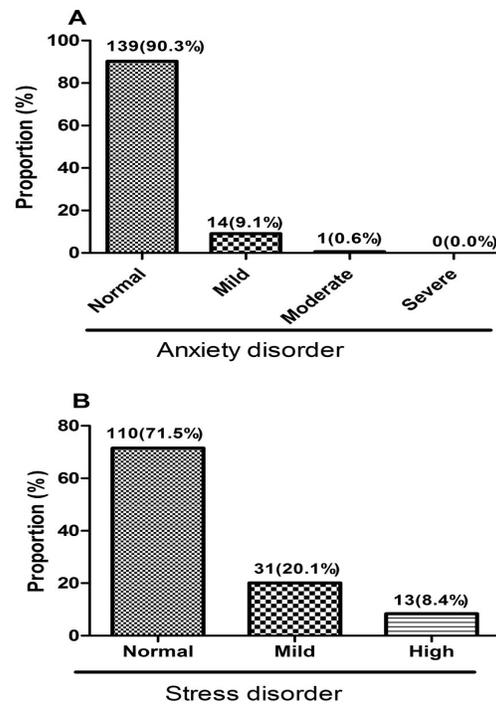


Figure 1: The prevalence of anxiety disorder (A) and stress (B) among the studied participant stratified by the severity of the condition.

pants) had moderate anxiety disorder while none of the studied participants (0.0%) had severe anxiety disorder (Figure 1A).

The prevalence of stress among these studied participants was 28.6% (i.e. 44 out of the 154 consented pregnant women) (Figure 1B). Also, 20.1% of the studied participants had mild stress (i.e. 31 out of the 154 consented pregnant women) and 8.4% of the studied participants had high level of stress (i.e. 13 out of the 154 consented pregnant women) as indicated in Figure 1B.

From this study, 64.3% of the studied participants did not have stress and anxiety disorder (i.e. 99 out of 154 consented pregnant women). About 7% of the studied participants had only anxiety disorder (i.e. 11 out of 154), 26% had only stress (i.e. 40 out of 154 consented pregnant women) and 2.6% of the antenatal women had both stress and anxiety disorder

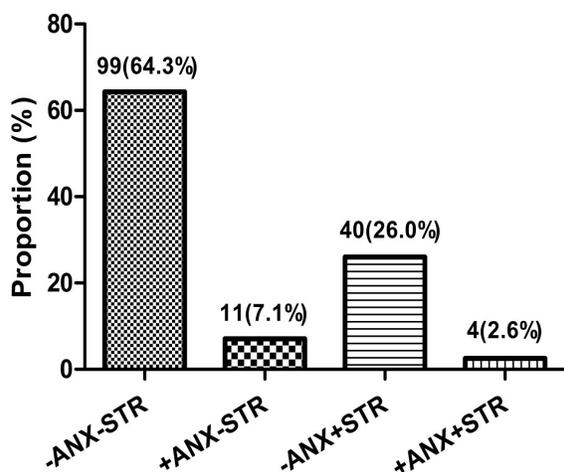


Figure 2: The prevalence of various combinations of stress and anxiety disorder among the studied participants.

Key- -ANX-STR = those without both stress and anxiety disorder, +ANX-STR = those with only anxiety disorder, -ANX+STR = those with only stress and +ANX+STR = those with both stress and anxiety disorder.

der (i.e. 4 out of 154 consented participants) as indicated in Figure 2.

Determinants of anxiety disorder

When the studied population was classified based on the presence and absence of anxiety disorder, the age, employment status, income level, marital status and its duration, obstetric data as well as stress score were not significantly different ($p > 0.05$) when those with anxiety disorder were compared to those without anxiety disorder using unpaired t-test or chi-square analysis (Table 2). However, significantly ($p = 0.0421$) higher proportion of those with anxiety disorder (26.6%) had attained tertiary education level as compared to those without anxiety disorder. Also, the mean \pm s.d. gestational weeks of those with anxiety disorder (15.6 ± 10.8 weeks) was significantly ($p = 0.0328$) lower than those without anxiety disorder (21.9 ± 10.8 weeks) as shown in Table 2.

Determinants of Stress

From Table 3, when the studied participants were grouped based on the stress score, the educational level, employment status, income level, duration of marriage, gestational weeks as well as complication in current and previous pregnancy were not significantly different ($p > 0.05$) when those with stress were compared to those without stress using unpaired t-test or chi-square analysis (Table 3). However, the mean \pm s.d. age of those with stress (28.1 ± 5.8 yrs) as compared to those without stress (25.0 ± 7.9 yrs) indicate that, those with stress were significantly ($p = 0.0155$) older as compared to those without stress (Table 3). Apart from that, fewer proportions of those with stress (90.9%) were married as compared to those without stress (99.1%). Also, the mean \pm s.d. number of birth of those participants with stress (1.8 ± 1.4) was significantly lower as compared to those without stress (4.3 ± 5.9) as indicated in Table 3.

DISCUSSION

Pregnancy is a time of enormous biological, psychological and social challenges for the pregnant woman and despite the fact that it is a period of fulfillment for the mother to be, it can also be a

Table 2: Socio-demographic characteristic as well as obstetric parameters of the studied population classified by anxiety status

Variables	Normal (n=139)	Anxiety disorder (n=15)	P values
Age (yrs)	27.7±5.8	29.3±5.9	0.3271
Educational level			
Illiterate	60(43.2%)	7(46.7%)	0.7950
Basic	34(24.4%)	3(20%)	0.7950
Secondary	32(23%)	1(6.7%)	0.1425
Tertiary	13(9.4%)	4(26.6%)	0.0421
Employment	58(41.7%)	7(46.7%)	0.7128
Income level	101.8±204.5	118.0±244.7	0.7755
Married	133(95.7%)	15(100%)	0.4118
Duration of marriage (yrs)	6.1±4.9	6.4±4.4	0.8414
Number of birth	1.6±1.4	2.1±1.3	0.2366
Gestational age (wks)	21.9±10.8	15.6±10.8	0.0328
No complication			
Current pregnancy	138(99.3%)	15(100%)	0.7417
Previous pregnancy	134(96.4%)	15(100%)	0.4552
Stress score	13.1±5.0	13.4±4.1	0.8389

Table 3: Socio-demographic characteristic as well as obstetric parameters of the studied population classified by stress status

Variables	Normal (n=110)	Stress disorder (n=44)	P values
Age (yrs)	25.0±7.9	28.1±5.8	0.0155
Educational level			
Illiterate	47(42.7%)	20(45.4%)	0.7578
Basic	29(26.4%)	8(18.2%)	0.2830
Secondary	22(20.0%)	11(25.0%)	0.4945
Tertiary	12(10.9%)	5(11.4%)	0.9352
Employment	44(40%)	21(47.7%)	0.3804
Income level	88.0±192.7	93.3±197.6	0.8752
Married	109(99.1%)	40(90.9%)	0.0097
Duration of marriage (yrs)	7.9±5.8	6.3±5.4	0.1062
Number of birth	4.3±5.9	1.8±1.4	0.0054
Gestational age (wks)	19.9±10.5	21.5±10.8	0.3661
No complication			
Current pregnancy	109(99.1%)	44(100%)	0.5257
Previous pregnancy	105(95.5%)	43(97.7%)	0.5102
Anxiety score	15.0±3.7	15.6±3.4	0.4244

time of emotional and psychological disturbances when dealing with new demands. In this study, anxiety was found to be prevalent in almost one in ten pregnant women, and stress in about one in every three pregnant women. Pregnancy related stress was about three times more common than pregnancy related anxiety. Literacy levels and gestation period were found to be the main determinants of pregnancy related anxiety, while age, marital status as well as number of birth showed strong associations with pregnancy related stress.

In this study, the prevalence of pregnancy specific anxiety disorder was found to be 9.7%. Sutter-Dallay *et al.*, (2004) however reported a lower prevalence of 8.4% while a higher prevalence of 24% was reported by Heron *et al.*, (2004). The differences in prevalence among the various studies may be as a result of the differences in the populations studied as well as the assessment tools used.

The prevalence of pregnancy related stress in this study was found to be 28.6%. This finding is comparable to that (24%) obtained by Rahman *et al.*, (2003). It is, however, lower than the 34% reported by Pantha *et al.*, (2014) and higher than the 14% as reported by Andersson *et al.*, (2004). Similarly, the differences in the prevalences in the various studies could be accounted for by the differences in population studied and the assessment tools used.

The study revealed that higher education has an impact on anxiety in pregnant women. In this study, a higher proportion of people who had attained tertiary educational status had anxiety disorders. The negative impact of literacy was pronounced in this study on the prevalence of anxiety and is consistent with the findings by Dunkel-Schetter, (2013) on education as a risk factor. This could be as a result of the fact that highly educated individuals are more sensitive to the symptoms of anxiety disorders and can easily report them and are not embarrassed about admitting pregnancy related anxiety symptoms. In contrast, other studies from around the world (Bolton *et al.*, 1998) have indicated literacy as protective factor. Literate pregnant women may have good social networks and social support, which has

been identified as a protective factor in previous research (Weiss *et al.*, 2002). Literacy gives individuals a sense of improved self-esteem or self-efficacy, enhances their feelings of self-worth, diminishes feelings of shame, and in turn, anxiety symptoms (Weiss *et al.*, 2002). Meanwhile, a study by Levin, (1991) found no association between educational status and pregnancy anxiety.

Lower gestation was found to be associated with pregnancy anxiety disorders, from this study. The influence of lower gestation on pregnancy related anxiety disorders has also been reported by Stat-ham *et al.*, (2008). They reported that anxiety was generally higher at 16 weeks of pregnancy, and explained that pregnant women's worry over the viability of the pregnancy and a possibility of a miscarriage was the major cause. As pregnancy proceeds and the viability of the fetus is established, fears of miscarriage are allayed.

However, a contrasting view was reported by Green *et al.*, (2003) who suggested that pregnancy related anxiety disorders become more common with increasing gestation, they explained that with increasing gestation comes increased anxiousness of pregnancy outcome, labour and changes in physical appearance. Others like Field *et al.* and Teixeira *et al.*, assert that variations in levels of anxiety over the pregnancy do not follow exactly a particular pattern, but rather seem to be characterized by high levels early and late in pregnancy, with a dip at mid-pregnancy, (Field *et al.*, 2010; Teixeira *et al.*, 2009).

From the current study, age was found to be positively associated with pregnancy related stress, this contradicts the findings of Arch, (2013) who showed that younger age is associated with higher levels of stress, whereas others find no relationship between maternal age and pregnancy related stress and anxiety, (Saisto *et al.*, 2001) or mixed findings depending on the timing of assessment (Gurung *et al.*, 2005). Most likely this is a U-shaped effect with women who are of youngest and oldest maternal age having higher stress anxiety. Teen pregnancies are likely to invoke more anxiety as are pregnancies

among women more than 35 years old (Guardino and Dunkel-Schetter, 2014).

Also, pregnant women who are not married are likely to experience pregnancy related stress. Similar outcomes have been reported by Rini *et al.*, (1999). Married women who report higher levels of social support from their husbands during their pregnancies tend to have lower levels of pregnancy stress and anxiety. While being married has been associated with lower pregnancy stress and anxiety (Da Costa *et al.*, 1999), the supportiveness and quality of a woman's relationship with her partner is important as well. In one study, poorer marital satisfaction was associated with higher pregnancy stress and anxiety (Da Costa *et al.*, 1999). Two additional studies showed that unmarried women who reported greater social support from the baby's father also had lower levels of pregnancy stress and anxiety (Gurung *et al.*, 2005; Saisto *et al.*, 2001).

This study also revealed that the more the number of previous births the less likely a pregnant woman will have pregnancy related stress. Women who have given birth before are typically lower in pregnancy related stress and anxiety (Gurung *et al.*, 2005). The experience of a previous pregnancy means they have already been through pregnancy and childbirth at least once and know what to expect. However, another study reported that women who have given birth before could also have high levels of pregnancy related stress and anxiety if their previous delivery experiences were negative (Rouhe *et al.*, 2008).

CONCLUSION

This study reiterates the rising levels of pregnancy specific stress and anxiety, with social and medical factors such as literacy levels, gestational period, age, marital status and parity playing major roles in the determination of pregnancy related stress and anxiety levels. The study highlights the need for proper education about pregnancy related problems and the need for provision of proper social support for pregnant women in order to reduce the likelihood of pregnancy specific anxiety and stress so as to avert any possible negative outcomes.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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