**The prevalence of mental health morbidity and its associated factors among women in an antenatal care clinic in Tanzania**

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**Synopsis**

The symptoms of mental health disorders among pregnant Tanzanian women in this study are high and call for improved training of health care providers.

**Keywords**: pregnancy, mental health, anxiety, depression, PTSD, women, Tanzania, antenatal care

**Total word count**: 2498 words

**Abstract**

**Objective** Mental health morbidity during pregnancy is a serious public health issue due to its effects on the mother and the unborn child. This study seeks to establish mental health symptoms and associated factors among women attending antenatal care in Tanzania.

**Methods** A cross-sectional study was conducted among women attending antenatal care in a national referral hospital in Dar es Salaam, Tanzania. Women who consented and those who were physically well were included in the study. Trained research assistants carried out face-to-face structured interviews. The questionnaire captured anxiety and depressive symptoms using the Hopkins Symptoms Checklist (HSCL 25), the PTSD Diagnostic Scale (PDS) captured symptoms of posttraumatic stress disorder (PTSD).

**Results** Of the 1180 women interviewed, 905 (76.7%) had symptoms of anxiety, 923 (78.2%) had symptoms of depression and 58 (4.9%) had medium PTSD symptoms. After adjusting for women’s socio-demographic characteristics, symptoms of anxiety, depression and moderate symptoms of PTSD were associated with the women’s and their partner’s age, educational level, relationship duration, women’s employment and marital status.

**Conclusion** The majority of women in this study had symptoms of mental health disorders. These findings call for training of health care providers and screening of mental health disorders in antenatal care. **Introduction**

Mental health disorders are a serious health concern during pregnancy, as they are known to be associated with postnatal depression, inadequate personal care, and negative postnatal effects, including failure to breastfeed, substance abuse and suicide [1, 2]. Studies in industrialised countries have found the prevalence of symptoms of mental health disorders during pregnancy to range between two and 26 percent for post-traumatic stress disorder (PTSD), seven to 13 percent for depression and eight to 16 percent for generalized anxiety disorder [1, 3, 4]. Evidence also shows that rates of depression are higher during pregnancy than in the postnatal period [5, 6]. Although few in numbers, studies from Sub-Saharan Africa show rates of depression and anxiety symptoms during pregnancy range from 33% to 50% in Nigeria and South Africa [7, 8]. To date, only one study has been conducted among pregnant women attending primary care clinics in Tanzania, establishing a prevalence of almost 40% for symptoms of depression [2]. However, this study did not investigate the prevalence of anxiety and PTSD symptoms and focused on HIV positive women in primary health care in a peri-urban area of Dar es Salaam.

The aim of this study is to establish the prevalence of symptoms of selected common mental disorders and their associations with socio-economic and partner relationship factors among pregnant women accessing a national referral hospital in urban Dar es Salaam, Tanzania.

**Materials and Methods**

A cross-sectional study was conducted at the national and university teaching hospital in Dar es Salaam, Tanzania. According to the Tanzanian Demographic and Health Survey 2010, nearly 100% of women in Dar es Salaam attend antenatal care [9]. Interviews were conducted with 1180 women from December 2011 to April 2012. Of the daily average of 80 women attending the antenatal care clinic, every fifth woman was invited to participate while waiting for their routine antenatal care check-up. Women agreeing to participate, were interviewed, utilizing private face-to-face structured interviews after a verbal informed consent process was performed by a trained research assistant. The study received permission from the hospital management and was ethically approved by the Muhimbili University of Health and Allied Sciences Research and Publications Committee.

The structured questionnaire collected socio-demographic information, including women’s and their current partner’s age, their educational and employment status, the women’s marital status, number of living children and relationship duration in years. To establish levels of depressive and anxiety symptoms, the Swahili version of the 25 item Hopkins Symptoms Checklist (HSCL-25) and PTSD Diagnostic Scale (PDS) were used [10, 11]. The HSCL 25 screened for symptoms of anxiety (10 items) and depression (15 items). The four-point response options of the HSCL 25 allowed for capturing symptom severity; ranging from 1, not at all present, to 4, extremely present [10, 12]. The HSCL 25 has face and discriminant validity amongst pregnant women with HIV in Tanzania with a sensitivity of 88% and a specificity of 89% and internal consistency of 0.93 Alpha [12]. The PDS is a screening tool for experiences of traumatic events ranging from witnessing event, for example, witnessing an accident, to actual experiences, for example child sexual abuse or recent physical or sexual abuse. Women screening positive for such exposure were asked about presence of PTSD symptoms, categorized as hyper arousal, re-experiencing events, arousal and hyper vigilance. Symptom frequency ratings included, 0 (not at all), 1 (once a week or less), 2 (between two and four times a week) and 3 (five or more times a week). It has an internal consistency of 0.92 Alpha, with a sensitivity of 0.89 and a specificity of 0.75 [11]. The PDS tool has been used in neighboring Uganda [13], but not validated in Tanzania. The principal investigator (BM) and a medical doctor conducted independent forward and backward translations of the PDS tool. Discrepant terms in the original and back-translated English versions were resolved to ensure optimal translation of meanings in the final Swahili tool.

Data analyses were conducted using STATA 12. Sum scores were computed for the anxiety and depressive symptoms on each of the HSCL-25 subscales. A mean score of anxiety and depression symptoms was calculated respectively. The mean score of anxiety ranged from 1 to 3.10. According to a study by Kaaya et al [12] of pregnant HIV positive women in Dar es Salaam, a cutoff point of 1.06 and above was interpreted as the precense of mild to severe anxiety symptoms. In the case of depression, the mean score ranged from 1 to 3.63 and a cutoff point of 1.06 and above reflected symptoms of mild to severe depression. PDS item scores were summed, and using recommended severity cut off scores [11], were summarized to reflect none, mild (1–10), moderate (11–20), moderate to severe (21–30) and severe (36–51) PTSD.

Frequency of depressive and anxiety symptoms as well as PTSD are presented by age. Multivariate logistic regressions, utilizing main effect models, controlled for socio-demographic risk factors (woman and partner’s age, educational attainment and employment, as well as woman’s marital status, and number of children) to determine their independent contribution to anxiety, depression and PTSD symptom. Strengths of associations were estimated using odds ratios. A p-value below 0.05 was considered significant.

**Results**

Among the 1,215 women invited to participate the response rate was 99.9% (n=1200). Out of them, 20 women did not complete the surveys. Analyses are based on 1,180 completed surveys.

The mean age of participants was 29 years, with a range of 17 to 43 years. The majority of the participants were married (72.9%, n=859), had secondary education (51.4%, n=606). Many were employed (37.3%, n=440) or self-employed (37.3%, n=440).

Rates of symptoms of anxiety, depression and PTSD were at 76.7% (n=905), 78.2% (n=923) and 4.9 % (n=58) respectively. While prevalence of symptoms of anxiety and depression were significantly higher among younger women, with the highest prevalence found among women aged 17 to 29 years olds, reports on PTSD symptoms did not significantly vary by age. Table 1 provides a summary of these findings.

Table 2 shows the adjusted analyses of the distribution of symptoms of anxiety, depression and PTSD and their associations with socio-demographic characteristics. Women’s and their partner’s age, level of education, women’s employment status, marital status and relationship duration were associated with symptoms of one or more of the mental disorders of interest.

Women’s age was associated with anxiety symptoms, with women above the age of 34 being less likely to report symptoms of anxiety. Compared to women aged 30 to 34 years, being 35 or above was associated with reduced odds of having symptoms of anxiety (AOR=0.60, 95% CI: [0.39, 0.90]). The age of women’s partners, if they were above 35 years old, was associated with both symptoms of depression and PTSD. Compared to women with partners aged 30 to 34 years, women with older partner’s were more likely to have symptoms of depression (AOR=0.67, 95%CI: [0.46, 0.97]) but less likely to report moderate to severe symptoms of PTSD (AOR=2.80, 95%CI: [1.31, 6.01])

Women’s level of education or that of their partners was also associated with symptoms of both depression and anxiety. Compared to women with only primary education, attainment of college education reduced the likelihood of depressive symptoms by 38% (AOR=0.54, 95%CI [0.31, 0.95]). On the other hand, a secondary education compared to primary level of education of her partner increased both levels of anxiety (AOR=2.08, 95%CI 1.37, 3.16) and depression (AOR=2.00, 95%CI: [1.31, 3.06]), as did a college level education compared to a primary education (AOR=2.25 95%CI: [1.32, 3.83] and AOR=2.29, 95%CI: [1.33, 3.96], respectively).

Self-employment in participants, compared to being employed was associated with both symptoms of anxiety and depression, increasing the odds of endorsing anxiety or depression symptoms by 11.56 (95%CI: [1.09, 2.23]) and1.52 (95%CI: [1.04, 2.21]) respectively.

The participant’s marital status was associated with their likelihood of reporting moderate to severe symptoms of PTSD (AOR=2.71, 95%CI: [1.17, 6.28]), while a short relationship duration with a partner was protective for moderate to severe PTSD symptoms (AOR=0.27, 95% CI: [0.08, 0.93]) and symptoms of anxiety (AOR=0.56, 95% CI: [0.36, 0.87]).

**Discussion**

The prevalence of symptoms of anxiety, depression and PTSD among antenatal clinic attendees in this study were high, with rates of 77%, 78% and five percent respectively. The prevalence of both anxiety and depression was highest among women aged 17 to 29 years, while for PTSD; prevalence was highest among women aged 30 to 34 years.

The prevalence rates of depressive symptoms found in this study are higher than those found in industrialized countries [1, 3, 4], echoing the results of two studies of HIV positive pregnant women in primary care in Dar es Salaam, which found a prevalence of 39.5% and 42.7% respectively [2, 14] . Both of these studies utilized a DSM IV calibrated cut-off score on an adapted HSCL-8 Scale to define depression. One of the studies [14] was conducted within the context of a randomized trial of pregnant HIV positive women. These women probably reported lower levels of depression than found in this study; as they were more empowered due to already having received extensive individual and group supportive counseling following their HIV test results given two to three months before the psychological assessments took place. The higher rates of depressive symptoms in this analysis may also reflect the tertiary care setting, in which recruitment for this study occurred. It is likely that more women with problematic pregnancies and obstetric complications attend tertiary care and that attendant stressors impacted on psychological measures. Our rates for symptoms of anxiety were also higher than the rate for DSM IV anxiety disorder during late pregnancy of 39.0 % reported in Nigeria [15].

This study further established that symptoms of anxiety and depression are associated with the participant’s and their partner’s employment and educational attainment, both of which can be considered proxy markers of socio-economic status. Participants who were self-employed compared to participants who were formally employed were more likely to report high symptoms of anxiety, depression or both. Self-employment in the Tanzanian context often refers to unskilled work involving ownership of small-scale enterprises or businesses, such as work as street vendors. These, often informal economic sector forms of self-employment, are often characterized by high economic instability, insecurity and low income [16]. A recent survey in Dar es Salaam showed that most small business enterprises are established as a result of ‘push’ factors, for example, established out of desperation to make ends meet, and that female owned enterprises have lower income-generation potential than those owned by males [17]. It is likely that women in this study engage in self-run small scale businesses due to difficulties in making ends meet, and this measure may be a proxy for lower-socio-economic status. The finding is in line with other studies that have reported associations between depression and lower socio-economic status [18].

Both partner’s education, relationship duration and participant’s marital status were associated with one or more of the mental disorders of interest in these analyses. Pregnant women who were not in a relationship were more likely to report moderate or high symptoms of PTSD. This might be due to economic concerns as well, as it may also determine the availability of financial resources in the home [19], in addition to family and social pressures to getting married. This is especially the case when pregnant women do not receive emotional or financial support from their partners as male partners are considered to be the main source of financial support in during pregnancy and child birth in Tanzania [18]. Societal stigma might also be a contributing factor for moderate to severe symptoms of PTSD amongst single pregnant women, particularly, in settings where women are not expected to get pregnant prior to marriage [20, 21]. While this analysis did not include measures of intimate partner violence, it is likely that an association exists, as it is known from studies worldwide and in Tanzania itself that intimate partner violence is linked to women’s age, women’s educational level and employment status [22-24]

Certain following limitations need to be considered when interpreting the findings of this study. First, this is a cross-sectional study, thus limiting interpretations regarding causality and temporality. It therefore can only establish factors associated with mental health symptoms among participants. Second, the study screened for symptoms of selected mental disorders and fell short of using diagnostic tools and therefore could not diagnose mental health disorders. It only collected participant’s reports of mental health symptoms. This might partially explain the high prevalence of anxiety and depressive symptoms in this study. While the Hopkins Symptom Checklist was validated amongst pregnant women living with HIV in Tanzania [12], the PDS has not been evaluated there, although it has been used in the East African region. Furthermore, the cut-off point for the Hopkins Symptoms Checklist, as evaluated in Tanzania, indicates the existence of any symptom of anxiety or depression, including mild symptoms. Comparisons with other studies using moderate to severe symptoms of anxiety and depression are therefore difficult. Also, the PDS tool explores PTSD symptom only in women where a severe traumatic event is captured. Third, stigma towards mental health disorders in Dar es Salaam is high, and exploring symptoms can be subject to under reporting due to social desirability influences. Finally, the study took place in a national university teaching hospital in the capital city of Tanzania and is therefore not generalizable to the whole population, especially rural areas of Tanzania.

Despite these limitations, this study is important to increase awareness of the magnitude of common mental health disorders during pregnancy, and to provide baseline information for further exploration of potential health effects among pregnant women in Tanzania.

Women who experience mental health disorders and seek medical advice in Dar es Salaam receive standard care, such as medication, counselling or hospitalization. However, our findings show that many pregnant women with mental health disorders are not diagnosed if they do not bring the issue up themselves. This suggests the need to incorporate knowledge and skills for recognition and management of mental health disorders in the pre- and in-service training course curricula of doctors and other health care personnel providing services for pregnant women. Health care professionals should be encouraged to provide women with information about depression, anxiety and PTSD and should attend to symptoms that may suggest the presence of these conditions, such as low mood, insomnia, and suicidal thoughts, through assessment and, as appropriate, referral or management [25]. Lastly, as mental disorders are a serious problem among pregnant women in antenatal care, health care providers should, at a minimum, find ways to work collaboratively with mental health nurses. The high prevalence of adverse mental health symptoms among pregnant women in this study merits an improved health care response in the antenatal care setting.

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**Conflict of Interest**

The authors declare that they have no conflict of interest

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**Table 1: Prevalence of symptoms of mental health disorders in pregnant women in Tanzania across different age groups**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Types of symptoms assessed | Total N (%) | Respondent’s age (years) N(%) |  | p-value |  |
| 17-24 | 25-29 | 30-34 | 35-47 |  |  |
| Symptoms of anxiety  |  |  |  |
| No | 275 (23.3) | 43(18.2) | 75(18.3) | 93(25.5) | 46(27.1) | 0.001 |  |
| Yes | 905 (76.7) | 193(81.8) | 335(81.7) | 271(74.5) | 124(72.9) |  |  |
| Symptoms of depression |  |  |  |
| No | 257 (21.8) | 43(18.2) | 83(20.2) | 91(25.0) | 58(34.1) | 0.015 |  |
| Yes | 923 (78.2) | 193(81.8) | 327(879.8) | 273(75.0) | 112(65.9) |  |  |
| PTSD symptoms |  |  |  |
| Non or Low | 1122 (95.1) | 227(96.2) | 390(95.1) | 341(93.7) | 164(96.5) | 0.499 |  |
| Moderate or severe |  58 (4.9) | 9(3.8) | 20(4.9) | 23(6.3) | 6(3.5) |  |  |

**Table 2: Distribution and adjusted OR of socio-demographic factors associated with symptoms of anxiety, depression and PTSD among pregnant women**

| **Socio-demographic factors** | **Total****N (%)** | **Symptoms of anxiety n(%)** | **Symptoms of depression n(%)** | **Symptoms of PTSD n(%)** |
| --- | --- | --- | --- | --- |
| **No** | **Yes** | **AOR (95% CI)** | **No** | **Yes** | **AOR (95% CI)** | **None-Mild** | **Moderate-severe** | **AOR (95% CI)** |
| *Woman’s education* |  |
| Primary | 391 (33.1) | 90(32.7) | 301(33.3) | Ref. |  | 85(33.1) | 306(33.2) | Ref. |  | 368(32.8) | 23(39.7) | Ref. |
| Secondary | 606 (51.4) | 137(49.8) | 469(51.8) | 0.81 | [0.56,1.17] | 119(46.3) | 487(52.8) | 0.89 | [0.61,1.31] | 578(51.5) | 28(48.3) | 0.60 [0.31,1.19] |
| College | 183 (15.5) | 48(17.5) | 135(14.9) | 0.73 | [0.42,1.28] | 53(20.6) | 130(14.1) | 0.54\* | [0.31,0.95] | 176(15.7) | 7(12.1) | 0.70 [0.22,2.15] |
| *Woman‘s employment status.* |
| Employed | 440 (37.3) | 117(42.5) | 323(35.7) | Ref. |  | 108(42.0) | 332(36.0) | Ref. |  | 420(37.5) | 20(34.5) |  |
| Not working | 299 (25.4) | 79(28.7) | 220(24.3) | 0.99 | [0.65,1.51] | 76(29.6) | 223(24.2) | 0.95 | [0.62,1.46] | 290(25.9) | 9(15.5) | 0.57 [0.22,1.46] |
| Self employed | 440 (37.3) | 79(28.7) | 361(39.9) | 1.56\* | [1.09,2.23] | 73(28.4) | 367(39.8) | 1.52\* | [1.04,2.21] | 411(36.7) | 29(50.0) | 1.19 [0.60,2.33] |
| *Woman‘s age (years).* |
| 17-24 | 236 (20.0) | 43(15.6) | 193(21.3) | 1.44\* | [0.83,2.49] | 43(16.7) | 193(29.4) | 1.38 | [0.79,2.43] | 227(20.2) | 9(15.5) |  |
| 25-29 | 410 (34.7) | 83(30.2) | 327(36.1) | 1.23 | [0.85,1.80] | 75(29.2) | 335(36.3) | 1.35 | [0.92,1.97] | 390(34.8) | 20(34.5) | 1.00 [0.50,2.01] |
| 30-34 | 364 (30.8) | 91(33.1) | 273(30.2) | Ref. |  | 93(36.2) | 271(29.4) | Ref. |  | 341(30.4) | 23(39.7) | 1.16 [0.40,3.38] |
| 35-43 | 170 (14.4) | 58(21.1) | 112(12.4) | 0.60\*\*\* | [0.39,0.90] | 46(17.9) | 124(13.4) | 0.94 | [0.61,1.44] | 164(14.6) | 6(10.3) | 0.44 [0.17,1.13] |
| *Partner‘s age* |  |  |  |  |  |  |  | *.* |  |  |  |  |
| 17-24 | 17 (1.4) | 4(1.5) | 13(1.4) | 1.58 | [0.96,2.61] | 6(2.3) | 11(1.2) | 0.41 | [0.13,1.28] | 17(1.5) | 0(0.0) |  |
| 25-29 | 188 (15.9) | 31(11.3) | 157(17.3) | 0.80 | [0.23,2.79] | 31(12.1) | 157(17.0) | 1.20 | [0.72,2.00] | 180(16.0) | 8(13.8) | 1.47 [0.54,4.01] |
| 30-34 | 375 (31.8) | 88(32.0) | 287(31.7) | Ref. |  | 68(26.5) | 307(33.3) | Ref. |  | 364(32.4) | 11(19.0) |  |
| 35-58 | 600 (50.8) | 152(55.3) | 448(49.5) | 1.15 | [0.80,1.65] | 152(59.1) | 448(48.5) | 0.67\* | [0.46,0.97] | 561(50.0) | 39(67.2) | 2.80\*\* [1.31,6.01] |
| *Partner‘s education* |  |  |  |  |  |  | . |  |  |  |  |
| Primary | 192 (16.3) | 61(22.2) | 131(14.5) | Ref. |  | 58(22.6) | 134(14.5) | Ref. |  | 182(16.2) | 10(17.2) |  |
| Secondary | 649 (55.0) | 133(48.4) | 516(57.0) | 2.08\*\*\* | [1.37,3.16] | 121(47.1) | 528(57.2) | 2.00\*\* | [1.31,3.06] | 615(54.8) | 34(58.6) | 0.98 [0.43,2.23] |
| College | 339 (28.7) | 81(29.5) | 258(28.5) | 2.25\*\* | [1.32,3.83] | 78(30.4) | 261(28.3) | 2.29\*\* | [1.33,3.96] | 325(29.0) | 14(24.1) | 0.86 [0.30,2.48] |
| *Partner‘s employment status* |  |  |  |  |  |  |  |  |  |  |
| Employed | 655 (55.5) | 160(58.2) | 495(54.7) | Ref. |  | 145(56.4) | 510(55.3) | Ref. |  | 624(55.6) | 31(53.4) |  |
| Self employed | 525 (44.5) | 115(41.8) | 410(45.3) | 1.32 | [0.95,1.82] | 112(43.6) | 413(44.7) | 1.17 | [0.84,1.63] | 498(44.4) | 27(46.6) | 1.04 [0.57,1.91] |
| *Marital Status* |  |  |  |  |  |  |  | . |  |  |  |  |
| Married | 859 (72.9) | 204(74.2) | 655(72.5) | Ref. |  | 188(73.2) | 671(72.8) | Ref. |  | 819(73.1) | 40(69.0) |  |
| Cohabiting | 111 (9.4) | 26(9.5) | 85(9.4) | 0.86 | [0.52,1.43] | 29(11.3) | 82(8.9) | 0.74 | [0.45,1.20] | 104(9.3) | 7(12.1) | 1.88 [0.78,4.56] |
| Not married | 97 (8.2) | 16(5.8) | 81(9.0) | 1.12 | [0.62,2.04] | 17(6.6) | 80(8.7) | 1.10 | [0.61,2.00] | 88(7.9) | 9(15.5) | 2.71\* [1.17,6.28] |
| Polygamous | 112 (9.5) | 29(10.5) | 83(9.2) | 0.98 | [0.61,1.60] | 23(8.9) | 89(9.7) | 1.28 | [0.76,2.16] | 110(9.8) | 2(3.4) | 0.30 [0.07,1.31] |
| *Relationship duration* |  |  |  |  |  |  |  |  |  |  |  |
| >1 year | 973 (82.5) | 222(80.7) | 751(83.1) | Ref. |  | 210(81.7) | 763(82.8) | Ref. |  | 918(81.9) | 55(94.8) |  |
| <1 year | 206 (17.5) | 53(19.3) | 153(16.9) | 0.56\*\* | [0.36,0.87] | 47(18.3) | 159(17.2) | 0.77 | [0.50,1.20] | 203(18.1) | 3(5.2) | 0.27\* [0.08,0.93] |
| *Number of children* |  |  |  |  |  |  |  |  |  |  |  |
| None | 457 (38.7) | 90(32.7) | 367(40.6) | Ref. |  | 93(36.2) | 364(39.4) | Ref. |  | 438(39.0) | 19(32.8) |  |
| 1+ | 723 (61.3) | 185(67.3) | 538(59.4) | 0.75 | [0.51,1.09] | 164(63.8) | 559(60.6) | 1.01 | [0.69,1.47] | 684(61.0) | 39(67.2) | 1.00 [0.50,2.01] |

**Key: \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001)**