# PREVALENCE AND RISK FACTORS CONTRIBUTING TO DEPRESSION AMONG PREGNANT WOMEN IN DISTRICT CHITRAL, PAKISTAN

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## ABSTRACT

**Objectives:** To estimate the prevalence of depression and its associated factors among pregnant women in district Chitral, Pakistan.

**Design:** A descriptive cross sectional study.

**Place and duration of study:** The study was carried out in a public hospital in district Chitral, Pakistan from May 2008 to June 2008.

**Subjects and Methods:** A consecutive sample of 340 pregnant women was approached for recruitment in the study. A short translated Khowar version of the Aga Khan University Anxiety and Depression Scale (AKUADS) was used to detect depression and a questionnaire was used to determine the associated factors of depression. The data were analyzed by SPSS version 15 using descriptive statistics and multiple logistic regression technique.

**Results:** Using the AKUADS, at a cut off score of e" 13, the prevalence of antenatal depression was around 34 %. The multivariate analysis showed that verbal/physical abuse (P=<0.001), unplanned pregnancy (P=<0.001), and illiteracy (P=<0.001) were independently associated with depression.

**Conclusion:** More than one third of pregnant women in district Chitral suffer from depression and this is associated with illiteracy, verbal/physical abuse and unplanned pregnancy. Policies must aim to incorporate routine screening programs for depression in obstetric care. Service providers can be trained to detect and manage depression and to refer women to the appropriate services. Counseling of couples may prevent unplanned pregnancies and reduce domestic violence.

**Keywords:** Depression, Pregnancy, Reproductive Health.

## INTRODUCTION

Depression is becoming a significant public health issue, with a continuous rise in its prevalence[1]. It is estimated that depression will rank as the second major cause of disease burden by 2020[2]. Women are at least twice as likely as men to experience depressive[3-4]. Women's reproductive events, such as pregnancy, pose a significant risk to the mental health of women[5].

Physical and emotional changes during pregnancy are usually dealt with during antenatal visits, and the symptoms are generally resolved without any problems[6]. However, the process of adapting to emotional change is often difficult for some women, and it usually becomes a major source of psychological distress[6-7]. Depressive symptoms during pregnancy often go unnoticed and are disregarded, and this may negatively affect a woman's health, fetal and infant development, and family relationships[8-11]. Recent studies from Pakistan have shown antenatal and postnatal depression to be associated with low birth weight, malnutrition, and poor physical health in their infants[12-15].

There is considerable evidence that the status in society, poverty, illiteracy, age, poor social support, violence, large families, grand-multiparity, having more than two female babies, serious arguments with significant family members, lack of autonomy in decision making, and a lack of access to health care correlate to the development of depression in pregnant women[16-20]. Although, there are a few hospital and community based

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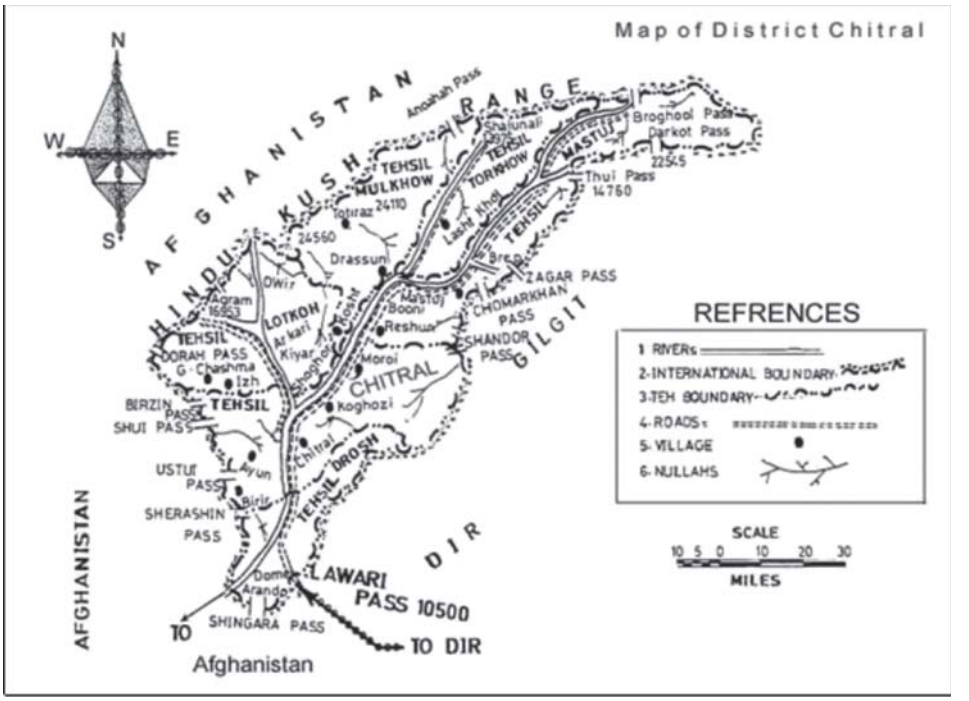


Fig. 1: Map of District Chitral, Pakistan

studies that have estimated the prevalence of antenatal depression and risk factors in the urban areas of Pakistan, there is little evidence available regarding the prevalence of depression and its risk factors among pregnant women in the rural northern part of the country. The purpose of this study was to estimate the prevalence of depression, and to determine its risk factors among pregnant women in District Chitral of the Khyber Pakhtoonkhwa Province, Pakistan.

## SUBJECTS AND METHODS

A descriptive cross sectional study was carried out in outpatient department of Obstetrics and Gynecology of the District Headquarter (DHQ) Hospital, Chitral. The DHQ Hospital caters to patients from all the villages of district Chitral.

### *Study Population:*

All pregnant women who were in their second and third trimesters and who were coming to the DHQ Hospital were the study population.

### *Study Area:*

Chitral is one of remote districts of Khyber Pakhtoonkhwa, Province, Pakistan with a population of 318,689 (162,082 males and 156,607 females)[21]. It is situated just across the border from Afghanistan (see map figure 1). The area is surrounded on the North West by the Hindu Kush Mountains, on the North East by the Karakoram and on the South by the Hindu Raj range[21]. Geographically, Chitral is a mountainous area and the communities are mainly located along the river valleys. Therefore, travelling is difficult due to lack of good roads and transportation. Moreover, the climate is extreme for several months of the year, especially the harsh winter months do not allow much economic activity in the area. Subsistence farming tends to be common in the area and productivity depends upon the climate.

The people are culturally more conservative than the people in the rest of the country. Because of cultural and religious influences women's mobility is restricted and they are restricted to interact with their male relatives and other women. Thus, they have limited access to health care and information and other resources. Moreover, in most cases, Chitrali women are less educated and have a lower socio-economic status than women in urban areas of Pakistan. Most often, they are housewives and are dependent on the male members of the family for decision making, generating income and getting access to health care facilities. Keeping in view the prevalence of depression and reported risk factors in Pakistan, and other developed and developing countries, together with the lack of mental health services, economic condition, and geographical constraints of the respective region, this study was conducted with the aim to estimate the prevalence of depression, and to determine the associated risk factors among pregnant women in District Chitral, Pakistan.

### *Sample Size:*

Calculated sample size was a minimum sample of 318 pregnant women, based on an anticipated prevalence rate of 35%[22-23], with a relative precision of 15%. Using an estimate of 63%[7,24] of illiteracy among pregnant women as the main risk factor, a sample size of 302

was required to detect an odds ratio of 0.5 with 80% power and 5% significance level. Epi-info 6 and the WHO sample size software were used for the calculation of the sample size.

The inclusion criteria for this study was pregnant women attending antenatal clinic in their second and third trimester of pregnancy confirmed by last date of menstrual period or ultrasound, not having any of the following medical illnesses (antepartum hemorrhage, chronic or pregnancy induced hypertension, pre-eclampsia, diabetes/gestational diabetes, cardiac diseases and known psychotic illness), able to speak the local language, *Khowar* and given their consent to participate in the study.

Ethical approval for the study was obtained from the Ethical Review Committee of the Aga Khan University. Institutional consent was taken from the responsible authority of DHQ Hospital, Chitral. A voluntary informed consent was taken prior to the data collection.

For detecting depression during pregnancy the validated short Urdu version of the Aga Khan University Anxiety and Depression Scale[25] was used to screen and label study participants having depression during pregnancy. AKUADS was originally developed in Urdu for the general Pakistani population[26] in 1998 by Ali and colleagues for measuring anxiety and depression, and has been diagnostically validated for depression among pregnant population in Pakistan, using the DSM-IV criteria[22,25]. The short version of AKUADS has 13 psychological items. Each item has four response options (Never, Sometimes, Often, Always) and has a score from 0 to 3.

Besides the AKUADS-Short Form, a questionnaire was constructed for assessment of risk factors of depression during pregnancy. This questionnaire was used to obtain information regarding socio-demographic factors including age, education level and occupation status of the participants, education level and employment status of the husbands, monthly income of the family in rupees, information about family system, parity as well as the present pregnancy status (planned or unplanned pregnancy). In addition, the same questionnaire was used to elicit information pertaining to psycho-social factors, such as presence of the husband at home, marital satisfaction, loss of parents and in-laws, history of verbal and physical abuse, nature of abuse, abuser (husband or in-laws), depression during previous pregnancies and the postnatal period and the use of substance (snuff) was also included in the questionnaire.

This questionnaire was given to the experts for content validity and was modified accordingly. Moreover, the AKUADS-Short Form and the questionnaire were translated into the local language, *Khowar,* which is a written language. The responses were back translated into Urdu to assure language validity. The translated form was administered to a similar population, for pre-testing of the questionnaire, to check whether the words, phrases, or sentences lacked clarity, or whether they were difficult for the participants to comprehend. Accordingly, the necessary revisions were made to the translated version. A consecutive sampling method was used for this study. The data collection started in the first week of May 2008, and it continued until the last week of June 2008. This assessment was carried out by the principal investigator.

Data was analyzed by using the Statistical Package for Social Sciences version 15.0. Descriptive statistics were calculated and multiple logistic regression was applied to examine the relationship between socio-demographic and psycho-social factors and depression during pregnancy.

## RESULTS

Three hundred and forty women in the second and third trimester of their current pregnancy were approached for recruitment in the study. Seven women (2.0%) refused to take part in the study. Five participants were excluded from the study because they were not meeting the inclusion criteria. The response rate was 97.9%. Table 1 shows the socio-demographic characteristics of the study participants. The prevalence of depression during pregnancy, according to the AKUADS-Short version, using the cut off score of > 13, was 33.8%. Out of 328 pregnant women, there were 117 women who were in their second trimester out of which 29% were having depression. Remaining 211 women who were in their third trimester out of them 36.5% women reported depression.

A univariate analysis of the socio-demographic variables and their associations are shown in Table 2. For continuous variables the independent samples *t-test* and for categorical variables the *chi square test* was applied. For the univariate analysis, the mean age among the non depressed group was 24.3 years, whereas among the depressed group the mean age was 26.3 years. Older women were more likely to be depressed. The difference was statistically significant (P=0.004). Moreover, the prevalence of depression was higher among illiterate women (64.9%) than among the literate women (35.1%), and the difference was highly significant (P=<0.001). The women belonging to the nuclear and joint families had similar percentages and they were more likely to be depressed (52.3%) than women living in extended families (47.7%). The difference was significant (P= 0.036). Therefore, for multivariate analysis, nuclear and joint families were merged together. Similarly, primigravidas and

**Table 1**
**Socio-demographic variables of the participants with frequencies and percentages (n= 328)**

| | Socio Demographic Variables | Frequencies | Percent |
|---|---|---|---|
| *AKUADS scores of participants | < 13 | 217 | 66.2 |
| | >13 | 111 | 33.8 |
| Trimesters of pregnancy | Second trimester (14 to 26 weeks) | 117 | 35.5 |
| | Third trimester (27 to 40 weeks) | 211 | 64.3 |
| Age group (years) | Less than 20 years | 52 | 15.9 |
| | 20-24 years | 116 | 35.4 |
| | 25-29 years | 91 | 27.7 |
| | 30-35 years | 39 | 11.9 |
| | More than 35 years | 30 | 9.1 |
| Education status of the participants | Illiterate | 164 | 50.0 |
| | Primary | 52 | 15.9 |
| | Secondary | 51 | 15.5 |
| | Intermediate | 29 | 8.8 |
| | Graduate | 14 | 4.3 |
| | Postgraduate | 10 | 3.0 |
| | Madrassa | 8 | 2.4 |
| Employment status of the participants | Housewife | 282 | 86.0 |
| | Home based (sewing, stitching) | 27 | 8.2 |
| | Employed outside home | 19 | 5.8 |
| Estimated monthly income of the family (Rs.) | Less than 1,000 | 22 | 6.7 |
| | 1,000-5,000 | 88 | 26.8 |
| | 5,000-10,000 | 69 | 21.0 |
| | More than 10,000 | 108 | 32.9 |
| | Do not know | 41 | 12.5 |
| | **Nuclear family | 102 | 31.1 |
| | ***Joint family | 43 | 13.1 |
| | ****Extended family | 183 | 55.8 |
| Parity | Primi-gravida (first time pregnant) | 89 | 27.1 |
| | Multi-gravida (pregnant for 2-4 times) | 171 | 52.1 |
| | Grand-multigravida (pregnant for >5 times) | 68 | 20.7 |
| Present pregnancy status | *****Planned pregnancy | 228 | 69.5 |
| | ******Unplanned pregnancy | 100 | 30.5 |

* Cut-off value for depression was > 13

** A family consists of only parents and their children.

*** A family consists of at least three generations, with married sons, their wives and children.

**** A family consists of two or more adults from different generations of a family that includes parents, children, cousins, aunts, uncles and grandparents.

***** Pregnancy happened at the right time or desired time.

****** Pregnancy happened when no more children were desired or pregnancy occurred earlier than the desired time.

**Table 2**

**Univariate analysis of socio-demographic variables associated with depression during pregnancy (n=328)**

| Socio-Demographic Variables | | Not Depressed | Depressed | OR(95 % CI) | P-value |
|---|---|---|---|---|---|
| | | n (%) | n (%) | | |
| * Mean age | (in years) | Mean (SD) | Mean (SD) | — | — |
| | | 24.3 (5.1 ) | 26.3 (6.1) | — | 0.003 |
| Education status of the participants | Illiterate | 92 (42.4) | 72 (64.9) | 2.5 (1.56-4.03) | <0.001 |
| | | | | | |
| | Literate | 125 (57.6) | 39 (35.1) | — | — |
| Employment status of the participants | Housewife | 189 (87.1) | 93 (83.8) | 1.0 (.40-2.90) | 0.474 |
| | Home based (sewing) | 15 (6.9) | 12 (10.8) | — | — |
| | Employed outside home | 13 (6.0) | 6 (5.4) | — | — |
| Estimated monthly income of the family in rupees | Rs Less than 1,000 | 13 (6.0) | 9 (8.1) | .0 (.00) | 0.769 |
| | 1,000-5,000 | 56 (25.8) | 32 (28.8) | 1.5 (.76-2.98) | — |
| | 5,000-10,000 | 44 (20.3) | 25 (22.5) | 1.5 (.86-2.81) | — |
| | More than 10,000 | 75 (34.6) | 33 (29.7) | 1.5 (.85-3.01) | — |
| | Do not know | 29 (13.4) | 12 (10.8) | (Ref) | — |
| Family system | Nuclear/ joint family | 87 (40.1) | 58 (52.3) | 1.6 (1.03-2.60) | 0.036 |
| | Extended family | 130 (59.9) | 53 (47.7) | — | — |
| Parity (grand multigravida) | No | 179 (82.5) | 81 (73.0) | — | |
| | Yes | 38 (17.5) | 30 (27.0) | 1.7 (1.01-3.01) | 0.044 |
| Present pregnancy status | Planned pregnancy | 169 (77.9) | 59 (53.2) | — | — |
| | Unplanned pregnancy | 48 (22.1) | 52 (46.8) | 3.1 (1.90-5.10) | <0.001 |

*Mean (SD) SD= Standard Deviation

multigravidas were merged, because they were less likely to be depressed than grand-multigravidas. The difference was statistically significant (P=0.044). In addition, unplanned pregnancy was significantly associated (P=<0.001) with depression during pregnancy.

The univariate analysis of psycho-social variables and their associations are shown in Table 3. The answers of the respondents, regarding their satisfaction with their marital life and support received from their partners or otherwise, were categorized dichotomously (satisfied/ not satisfied). Marital dissatisfaction was significantly associated (P=0.007) with depression among pregnant women. Similarly, the prevalence of depression was significant (P=0.018) among women who had lost their parents. There was a small percentage of respondents indicating physical abuse and the husband was the most common perpetrator of abuse. Therefore, verbal and physical abuses were combined for analysis. Among the depressed group, 62.2% of the participants had experienced verbal/physical abuse as compared to the non depressed group (37.8%). The difference was highly significant (P=<0.001). Similarly, the use of substance (snuff) was associated (P=0.034) with depression during pregnancy.

The simultaneous effects of the significant risk factors of antenatal depression were analyzed using logistic regression analysis, including those variables that had a significant effect in the univariate analysis. The variables entered were: age, the participants' educational level, family system, grand-multiparity, unplanned preg-

**Table 3**

**Univariate analysis of psycho-social variables associated with depression during pregnancy (n=328)**

| Socio-Demographic Variables | | Not Depressed | Depressed | OR(95 % CI) | P-value |
|---|---|---|---|---|---|
| | | n (%) | n (%) | | |
| Presence of husband | Always present | 149 (68.7) | 81 (73.0) | (Ref) | — |
| | Weekends | 15 (6.9) | 6 (5.4) | 0.7 (0.28-1.97) | 0.831 |
| | Monthly | 13 (6.0) | 7 (6.3) | 0.9 (.38-2.58) | — |
| | Yearly | 40 (18.4) | 17 (15.3) | 0.7 (.42-1.47) | — |
| *Marital satisfaction | — | Mean (SD) | Mean (SD) | — | — |
| | Satisfied | 5.0 (.3) | — | — | — |
| | Not satisfied | — | 5.3 (1.2) | — | 0.007 |
| Loss of parents | yes | 53 (24.4) | 41 (36.9) | 1.8 (1.11-2.97) | 0.018 |
| | No | 164 (75.6) | 70 (63.7) | — | — |
| Loss of in-laws | Yes | 105 (48.4) | 48 (44.1) | .8 (.53-1.34) | 0.466 |
| | No | 112 (51.6) | 62 (55.9) | — | — |
| History of abuse (present pregnancy) | Yes | 23 (10.6) | 42 (37.8) | 5.1 (2.88-9.15) | <0.001 |
| | No | 194 (89.4) | 69 (62.2) | — | — |
| **Use of substance (snuff) | Yes | 4 (1.8) | 7 (6.3) | 3.5 (1.03-12.52) | 0.034 |
| | No | 213 (98.2) | 104 (93.7) | — | — |

* Mean (SD) SD= Standard Deviation

** Substance abuse is defined as the use of snuff (naswar), a preparation of tobacco placed between the cheeks and the gum.

**Table 4**

**Adjusted Odds Ratios and 95% CI of risk factors associated with depression during pregnancy (n=328)**

| Characteristics | | OR (adj.) | 95.0% C.I. | | P-value |
|---|---|---|---|---|---|
| | | | Lower | Upper | |
| Participant literate | No | 1.83 | 1.08 | 3.08 | <0.001 |
| | Yes (ref) | — | — | — | — |
| Status of current pregnancy | Unplanned | 2.31 | 1.35 | 3.95 | <0.001 |
| | Planned (ref) | — | — | — | — |
| Participant abused verbally or physically | Yes | 4.63 | 2.54 | 8.46 | <0.001 |
| | No (ref) | — | — | — | — |

OR = Odds Ratio (adjusted)

CI = Confidence Interval

nancy, marital satisfaction, loss of parents, verbal/physical abuse, and substance use. The results are shown in Table 4. Statistically significant associations remained positive for verbal/physical abuse (P=<0.001), unplanned pregnancy (P=<0.001), and illiteracy (P=<0.001). The strongest predictor of depression among the study population was physical or verbal abuse. This was independent of the participants being illiterate, having unplanned pregnancies, or their age.

## DISCUSSION

In this study, the overall prevalence of depression among pregnant women was estimated to be 33.8%, which is consistent with other studies in Pakistan[22- 23,27]. Multivariate analysis of this study showed a significant association (P= <0.001) between illiteracy and depression during pregnancy. Other studies have also reported a similar association between illiteracy and depression, in general, as well as in the pregnant population, in particular[24,27-34]. In this sample, unplanned pregnancy was found to be an independent predictor (P=<0.001) of depression during pregnancy.

The findings of this study were similar to other reports which found unplanned pregnancy to be one of the main risk factors for antenatal depression[24,34-38]. This study has shown a significant association (P=<0.001) between verbal/physical abuse and depression during pregnancy. Other studies have shown a significant association between a history of assault and depression during pregnancy[39], physical abuse and depression among pregnant women[7,30], violence and depression during pregnancy[36], and a verbal and physical abuse and depression among non pregnant women[19,28].

### *Strengths of the Study:*

In the available literature this is the first hospital based study that estimated the prevalence of depression among pregnant women and identified its risk factors in a remote rural district of Pakistan. Moreover, the desired sample size was captured within the timeframe allotted to data collection for the master's thesis. Furthermore, there was the low rate (2%) of non-participation. In addition, the current study also points to the need for future research and clinical attention to the much neglected common mental health problem in the pregnant population.

### *Limitation of the Study:*

This study has several limitations. When interpreting study findings, it is important to note potential limitations of the study design which may limit the generalizability of the findings. Sample was not a random sample of women in Chitral, the participants comprised of a consecutive sample of pregnant women who attended outpatient clinic of the DHQ hospital. They may be very different from other women who may not attend any health facility. Moreover, due to the cross-sectional nature of the study design, the causal association between the risk factors and antenatal depression cannot be determined. Further research, with a prospective design and a large sample size, is required to identify the risk factors of antenatal depression. Furthermore, the translated version of AKUADS was used due to the unavailability of locally validated screening or diagnostic instruments. AKUADS could not be validated in this population due to scope and time limitations.

## CONCLUSION

The findings of the current study indicate that more than one third of pregnant women in district Chitral suffer from depression. Besides confirming the role of established risk factors, for example illiteracy, unplanned pregnancy, and verbal/ physical abuses, it was found that extended family serves as a protective factor. Antenatal depression is a serious public issue since mental health problems during pregnancy are known to exert adverse influences on women, their fetus the infant, as well as their family. Therefore, this underlines the need for greater attention to be paid to the psychological well-being of the pregnant women. This has implications for early detection through screening which may help in planning early interventions, treatment, refer to appropriate health services, and developing preventive strategies to address depression during pregnancy.

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