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Prevalence of Antenatal Depressive Symptoms and its Associated Factors among Pregnant Nepalese Women with and Without Low Back- and/or Pelvic Girdle Pain

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ABSTRACT

Background: Pregnant women with health problems have shown higher odds of depressive symptoms. Evidence suggests a co-morbid relation between pregnancy-related low back pain and/or pelvic girdle pain and the risk of depression. The aims were to investigate the prevalence of symptoms of depression among pregnant Nepalese women in general and among pregnant Nepalese women with low back pain and/or pelvic girdle pain and to identify factors associated to symptoms of depression.

Methods: A cross-sectional study using standardized condition-specific questionnaires with response from 1284 pregnant Nepalese women. Multivariate logistic regression analysis determined variables associated with symptoms of depression.

Results: Twenty-one percent of the women presented with moderate to high symptom level of depression, compared to 29% of the women with low back pain and/or pelvic girdle pain. Low education, living without husband, no rest during work, higher self-reported disability, higher pain intensity and symptoms of pelvic organ prolapse were associated with higher odds of symptoms of depression among the women with low back pain and/or pelvic girdle pain. For the total sample, fetching water and having symptoms of low back pain and/or pelvic girdle pain and living without husband were associated to symptoms of depression.

Conclusions: Twenty-one percent of the pregnant women reported moderate to high symptom level of depression. The proportion of women with symptoms of depression was significantly higher among the women categorized as having low back pain and/or pelvic girdle pain. Our findings highlight the need to address both emotional and physical needs among pregnant Nepalese women.

Keywords: Depression; low back pain; maternal health; Nepal; pelvic girdle pain.

INTRODUCTION

Antenatal depression carries significant undesirable implications for health and wellbeing of women, children, and their families worldwide.[1] Few studies from Nepal have examined antenatal depression, however a prevalence of 18%-50% is reported.[2-5] Pregnant women with health problems have shown higher odds of depressive symptoms and there is evidence suggesting a co-morbid relation between pregnancy-related low back pain (LBP) and/or pelvic girdle pain (PGP) and the risk of depression in pregnant women.[2,6] To our knowledge, no previous studies have investigated the impact of LBP and/or PGP on symptoms of depression among pregnant women in Nepal. Hence, the aims of this study were to investigate the prevalence of symptoms of depression among pregnant Nepalese women in general and among pregnant Nepalese women with LBP and/or PGP, and to identify factors associated to symptoms of depression.

METHODS

In this cross-sectional study 1284 pregnant women were included successively from antenatal check-ups between May 2016 to May 2017 at two hospitals in Nepal; KIST Teaching Hospital in Kathmandu and Kathmandu University Dhulikhel Hospital located 30 kilometres northeast of Kathmandu.

Ethical approval was obtained from the Norwegian Regional Ethics Committee, Norway (REK Nord, 2015/2209); The Nepal Health Research Council Ethical Review Board (112/2016), Nepal; The Institutional Review Committee of Kathmandu University School of

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Medical Sciences/Dhulikel Hospital (25/16), Nepal. Oral and written consent was obtained from the participants who agreed to participate in this study.

The 5-item Edinburgh Depression Scale (EDS-5) was used to screen for symptoms of depression.[7] The EDS-5 demonstrates high correlation to the original EDS-10 and satisfactory sensitivity and specificity for women in the reproductive age.[7,8] EDS-5 consists of a 0-15 scale, with higher score indicating higher symptom level. The scores were dichotomised into < 7 indicating low symptom level and ≥ 7 indicating moderate to high symptom level.[7]

The women answered questionnaires on sociodemographic, pregnancy and workload characteristics, as described in detail by Acharya et al.[9] Sociodemographic data included age, height, weight, body mass index, ethnicity, education, monthly income, occupation, marital status and family type. Pregnancy characteristics were number of previous pregnancies and parities, and weeks of gestation. Workload information included fieldwork, household work and whether the women took rest during work. Women who reported presence of musculoskeletal pain were asked to mark the pain location on a body chart and were considered to have LBP and/or PGP if they pointed towards their lower back or pelvis. These women also answered questions regarding pain frequency, pain location, whether they believed that LBP or PGP would disappear after delivery and pain intensity past four weeks, measured on a Nepali version of the numeric rating scale (NRS 0-10).[10] The Nepali versions of the Pelvic Girdle Questionnaire (PGQ)[11] and the Oswestry Disability Index (ODI)[12] were used to assess activity limitations and symptoms of pregnancy-related LBP and PGP, both measured on a 0-100 scale with higher score indicating higher disability.

The pelvic organ prolapse- symptom score, POP-SS was utilized to reveal symptoms of pelvic organ prolapse (POP) as it has demonstrated satisfactory psychometric properties in populations both with and without symptoms.[13] Since no cut-off value could be identified for POP-SS, the cut-off for symptoms of POP was established at ≥ 3, representing the 75th percentile.

Data were analysed using IBM SPSS version 25. Descriptive data are presented as mean (standard deviation, SD) if normally distributed or median (interquartile range, IQR; 25th and 75th percentile) if skewed. Categorical data are presented as frequencies (percentage). Logistic regression analysis with odds ratio (OR) and 95% confidence intervals (CIs) was applied to reveal any associations between demographic and pregnancy-related variables and symptoms of depression using backward removal method. Independent variables with $p < 0.15$ in the bivariate analyses were included in the model. Significance level for the final model was set to 0.05. Model fit was examined by Hosmer & Lemenshow test, and power of explanation by Nagelkerke R Square.

RESULTS

Of 1284 women included in this study, 276 (21%) reported moderate to high symptom level of depression. In total, 432 (34%) of the women were categorized as having LBP and/or PGP, while the remaining 852 (66%) did not report having such complaints. There were significantly more women with moderate to high degree of depressive symptoms among those categorized as having LBP and/or PGP (n=127, 29%) compared to those without complaints (n=149, 17%) ($p<0.001$).

Table 1. Sociodemographic characteristics of the total sample (n=1284) and of the women reporting low back pain (LBP) and/or pelvic girdle pain (PGP) (n=432). Variables are shown with mean (standard deviation) and frequency (percentage).

	Total sample (n=1284)	LBP and/or PGP (n=432)
Age, mean (SD)	24.5 (4.3)	24.8 (4.0)
Ethnicity, n (%)		
Brahamin	244 (19)	91 (21)
Chetri	231 (18)	67 (16)
Newar	283 (22)	112 (26)
Tamang	276 (21)	80 (19)
Magar, Dalit, Other	259 (20)	82 (18)
Living with husband n (%)	1161 (90)	393 (91)
Family type, n (%)		
Nuclear	593 (46)	191 (44)
Joint/extended	691 (54)	241 (56)
Education, ≥ 9 years, n (%)	849 (66)	306 (71)
Employment, n (%)		
Housewife	1160 (90)	385 (89)
Business, private employed	214 (17)	89 (20)
Other	104 (8)	46 (10)
No personal monthly income, n (%)	1064 (83)	340 (79)
Housework, n (%)		
Field work	195 (15)	76 (18)
Taking care of children	451 (35)	141 (33)
Animal care	207 (16)	75 (17)
Fetching water	463 (36)	172 (40)
Take rest during work, n (%)	436 (34)	161 (37)

LBP= low back pain; PGP= pelvic girdle pain, SD= standard deviation

Sociodemographic characteristics of the women are presented in Table 1. Compared to the total sample, women with LPB and/or PGP were more often living in joint or extended families but without husband or with husband living abroad. A large proportion of the women had nine years or more of education, but only 17% had income of their own. Less than half of the women reported that they took rest during work.

Most of the women were in the second or third trimester of pregnancy (Table 2). The majority were nulliparous, although half of the women reported having been pregnant before.

Table 2. Pregnancy-related characteristics of the total sample (n=1284) and of the women reporting low back pain (LBP) and/or pelvic girdle pain (PGP) (n=432). Variables are shown with median (interquartile range, 25th and 75th percentile) and frequency (percentage).

	Total sample (n=1284)	**LBP and/ or PGP** (n=432)
Gestation week, median (iqr)ǂ	23 (15 - 32)	24 (17-34)
First trimester, n (%)	249 (20)	75 (18)
Second trimester, n (%)	514 (40)	172 (40)
Third trimester, n (%)	506 (40)	181 (42)
Pregnant before, n (%)		
Yes	664 (52)	217 (50)
No	620 (48)	215 (50)
Parity, n (%)		
Nulliparous	751 (59)	261 (61)
Primiparous	461 (36)	148 (34)
Multiparous	72 (6)	23 (5)
Body Mass Index, median (iqr)§	24.2 (22.0 - 26.6)	24.8 (22.4 - 27.0)
Underweight ≥18.5, n (%)	27 (2)	13 (3)
Normal weight 18.5 <25, n (%)	745 (58)	217 (51)
Overweight 25 <30, n (%)	421 (33)	160 (37)
Obesity ≤30, n (%)	83 (7)	39 (9)
The 5-item Edinburgh Depression Scale (EDS)		
Low symptom level <7, n (%)	1008 (79)	305 (71)
Moderate to high symptom level ≥7, n (%)	276 (21)	127 (29)
The Pelvic Organ Prolapse Symptom Score (POP SS), median (iqr)	0 (0 - 3)	3 (0 - 5)
Score ≤3, n (%)	940 (73)	209 (48)
Score >3, n (%)	344 (27)	223 (52)
ǂ n=1268/n=429; § n=1277/n=427 iqr= interquartile range; LBP= low back pain; PGP= pelvic girdle pain		

Among the women with LBP and/or PGP, the mean pain intensity for the past four weeks was 5. Most of the women experienced pain located to one or both sacroiliac joints, and only half of the women believed that the pain would disappear after giving birth (Table 3).

Table 3. Pain and disability among the women reporting low back pain (LBP) and/or pelvic girdle pain (PGP) (n=432). Variables are shown with median (interquartile range, 25th and 75th percentile) and frequency (percentage).

	LBP and/or PGP (n=432)
Pain frequency, n (%)	
On some days	285 (66)
On most days	102 (24)
Every day	45 (10)
Pain intensity (0-10, 0=no pain), median (iqr)	5 (4 - 6)
Pain location, n (%) ¥	
Symphysis	56 (13)
One or both sacroiliac joints	281 (65)
All three joints	31 (7)
Belief that LBP and/or PGP will disappear after giving birth, n (%) ǂ	
Yes	224 (52)
No	116 (27)
Don't know	89 (21)
Disability pelvic girdle	
The Pelvic Girdle Questionnaire (0-100, 0=no disability), median (iqr)	20 (10 - 32)
Disability low back	
Oswestry Disability Index (0-100, 0=no disability), median (iqr)	30 (20 - 38)
¥ n=368; ǂ n=429; iqr= interquartile range; LBP= low back pain; PGP= pelvic; girdle pain	

The adjusted model for the total sample shows that living without husband, fetching water, and having symptoms of LBP and/or PGP, gave statistically significant higher odds of moderate to high symptom level of depression (Table 4).

Table 4. Logistic regression analysis of variables that impact depression for the total sample. Results are presented as odds ratio (OR) with 95% confidence intervals (CI), n=1284.

	Unadjusted estimates		Adjusted estimates‡	
	OR (95% CI)	p	OR (95%CI)	p
Low education level	1.6 (1.2, 2.1)	0.001		
No monthly income	1.2 (0.9, 1.8)	0.25		
Living without husband	1.8 (1.2, 2.7)	0.004	1.8 (1.2, 2.7)	0.005
Nuclear family	1.0 (0.8, 1.3)	0.84		
Fetching water	2.1 (1.6, 2.8)	<0.001	2.0 (1.5, 2.7)	<0.001
Previously pregnant	1.3 (1.0, 1.7)	0.038		
One or more children	1.2 (0.9, 1.5)	0.31		
Doing field work	1.5 (1.1, 2.1)	0.023		
No rest during work	1.1 (0.8, 1.5)	0.41		
LBP/PGP	2.0 (1.5, 2.6)	<0.001	1.9 (1.5, 2.5)	<0.001

CI= confidence interval; LBP/PGP= low back pain/pelvic girdle pain; OR= odds ratio; ǂ =Nagelkerke R Square 0.07

Table 5. Logistic regression analysis of variables that impact symptoms of depression in pregnant women with LBP and/or PGP. Results are presented as odds ratio (OR) with 95% confidence intervals (CI), n=432.

	Unadjusted estimates		Adjusted estimates	
	OR (95% CI)	p	OR (95%CI)	p
Low education level	1.9 (1.2, 2.9)	0.006	1.9 (1.2, 3.2)	0.010
No monthly income	1.2 (0.7, 2.0)	0.47		
Living without husband	1.8 (0.9, 3.5)	0.10	2.6 (1.2, 5.6)	0.016
Nuclear family	1.2 (0.8, 1.8)	0.50		
Fetching water	1.8 (1.2, 2,7)	0.008		
Previously pregnant	1.7 (1.1, 2.5)	0.018		
One or more children	1.6 (1.0, 2.4)	0.036		
Doing field work	1.4 (0.8, 2.4)	0.20		
No rest during work	1.4 (0.9, 2.2)	0.11	1.7 (1.1, 2.9)	0.026
Disability pelvic girdle (PGQ total score)	1.03 (1.01, 1.04)	<0.001		
Disability low back (ODI)	1.05 (1.03, 1.07)	<0.001	1.03 (1.00, 1.05)	0.026
Symptoms of pelvic organ prolapse (POP ≥3)	4.6 (2.9, 7.3)	<0.001	2.9 (1.7, 4.9)	<0.001
Pain intensity	1.7 (1.5, 2.0)	<0.001	1.5 (1.3, 1.8)	<0.001

ǂ =Nagelkerke R Square 0.29, CI= confidence interval; OR= odds ratio; ODI= Oswestry Disability Index; PGQ= Pelvic Girdle Questionnaire

Among the women with LBP and/or PGP the adjusted estimates show that having low education, living without husband, no rest during work, higher self-reported disability (ODI score), symptoms of POP and higher pain intensity were associated with higher odds of symptoms of depression (Table 5).

DISCUSSION

The prevalence of depressive symptoms in this study was 21% for the total sample. Among the sub-group of women with LBP and/or PGP we found a prevalence of 29%, significantly higher than for the women without LBP and/or PGP. A comparable study among pregnant

women visiting public health facilities of Nepal reported a prevalence of 18%[2] and another study conducted in the rural mountain district of Sindhupalchowk, showed a prevalence of 23.8%.[3] Likewise, a recent systematic review of antenatal depression in South Asia found an overall pooled prevalence of 24.3%.[14] In a study from Bhaktapur, a prevalence of depressive symptoms of 39% was found among pregnant women who experienced the 2015 earthquake.[4] An even higher prevalence was reported in a small study from eastern regional hospitals where about 50% of the pregnant women had some form of depression.[5] The differences in occurrence highlights how methodological variations such as sample characteristics might influence on reported prevalence. Despite differences like sample districts, characteristics, sample size and screening tools all the studies have shown a noteworthy number of women reporting depressive symptoms during pregnancy in Nepal.

To our knowledge, our study is the first to explore depressive symptoms among pregnant women with LBP and/or PGP and associated factors in Nepal. Low education, living without husband, no rest during work, higher self-reported disability, higher pain intensity and symptoms of POP were associated with higher odds of symptoms of depression among the women with LBP and/or PGP. For the total sample, fetching water and having symptoms of LBP and/or PGP were together with living without husband, associated to symptoms of depression.

Consistent with our findings, in a recent community-based study among postpartum mothers, women with education level of ≤10 class were significantly more likely to have depressive symptoms compared to women with higher educational level.[15] Despite a higher level of education in our sample than average for Nepalese women[16] , the majority of the women was housewives and had no income. Approximately 84% of women in Nepal are informally employed in agriculture and largely involved in unpaid self-sustaining labour.[17] The women specified that their housewife chores included taking care of children, fetching water, doing field work and taking care of livestock. Considerations of workload are especially interesting for the women who reported that their husbands were living away from home. Significantly higher odds of symptoms of depression have previously been reported among women with husbands who had migrated during pregnancy.[18] The migration tendencies among the male population might have imposed several profound effects on women's roles and burden of work,[16, 17] together with a feeling of being alone or lack of support from their spouse.

One of the physically demanding chores related to housework, fetching water, significantly increased the odds of having symptoms of depression. As water represents an absolute life necessity, the scarcity of water and lack of access to safe drinking water might increase the total amount of life stress, especially for expectant mothers and caregivers. A study conducted in Kathmandu found an association between urban household water supply and postnatal depression.[19] The association between fetching water and having symptoms of depression during pregnancy might be linked to the physical and psychological burden of being responsible for sustaining the family with adequate water supplies.

Strenuous work burden has been reported as a risk factor for LBP and/or PGP, leaving these women vulnerable to such maternal co-morbidities.[20] Higher self-reported pain intensity and disability were significantly associated with symptoms of depression for women with LBP and/or PGP, which suggests that having depressive symptoms could affect how we perceive disability and tolerate pain, or vice versa, that experiencing higher disability and pain intensity might affect symptoms of depression. These assumptions are consistent with Virgara et al., who concluded that women who had increased depressive symptoms in combination with LBP and/or PGP experienced greater functional disability than women with LBP and/or PGP alone.[6] It is plausible that impairment and the experience of pain might cause more stress and worry in relation to the performance of household chores, especially when living without husband. In the absence of external support and lack of rest, women might be exposed to increased life stress, factors that have been acknowledged to play a significant role in the development of antenatal depression.[21]

Among the women with LBP and/or PGP, POP was significantly associated with symptoms of depression. Even though few studies have investigated the psychosocial impacts experienced by women with POP in Nepal, POP has negative psychosocial consequences and women reported embarrassment in relation to their condition.[22,23] The experience of POP symptoms during pregnancy has been linked to high workloads and might lead to disability, worry and difficulties in performing assigned household chores, and might thus be linked to depression.[24-26] Similarly, a study from Saudi-Arabia also showed an association between depression and pelvic floor disorders.[27]

Our findings highlight the importance of addressing both emotional and physical needs among pregnant women. Antenatal visits provide an opportunity for the pregnant women to receive medical information concerning musculoskeletal pain as well as depressive symptoms. Dawadi et al., found that women who visited antenatal clinics less than four times during their last pregnancy, were more likely to develop depressive symptoms in the postpartum period.[15] Hence, antenatal check-up to serve the needs of these patients is likely to improve pregnant women's pain, disability and emotional health, and possibly to reduce the risk of antenatal depression to persist postpartum.

The major strength of our study is the large number of women included. A sample size of 1284 is significantly higher than most other studies found on depressive symptoms among pregnant women,[2-5] and also postpartum women in Nepal.[6,15,18,28] It is also a strength that the participants were recruited from two district hospitals, 54% from Dhulikhel hospital and 46% from KIST hospital, hence including a broader representation of Nepal's urban and rural population. A further strength is that data collection method was standardized.

Self-reported questionnaires were used to capture clinical conditions such as depression, POP and LBP and/or PGP. Optimally, additional clinical examinations should have been performed to validate these conditions, but it was not feasible with the large sample size in this study. Still, it is a limitation.

To measure depression, the EDS-5 was used. It might be argued that the EPDS-10 should have been the favoured measure, however the EDS-5 has been recommended to assess depression in large-scale health surveys.[7] The Nepalese version of the EPDS-10 has shown good validity and is recommended for use in screening of postpartum depression in Nepal.[29] However, the EPDS-10 has not yet been formally validated in Nepal for pregnant women, neither has the EDS-5. For the EDS-5, the scores were dichotomised into < 7 = mild symptom level and ≥ 7 = moderate to high symptom level.[7] This dichotomization has for reproductive women shown a specificity of 92% and a sensitivity of 56%,[7] indicating a risk that some women were classified as false negative. To enable comparisons between the EPDS-10 and the EDS-5, cut-off values of ≥ 10 and ≥ 7 respectively, indicate a moderate to high symptom level of depression.[7] As this was a study with a cross-sectional design, we could not identify casual pathways for depressive symptoms.

CONCLUSIONS

Of 1284 pregnant women, 21% reported moderate to high symptom level of depression, while 29% of the women categorized as having LBP and/or PGP reported moderate to high symptom levels. Low education, living without husband, no rest during work, higher self-reported disability, higher pain intensity, symptoms of POP, fetching water and having symptoms of LBP and/or PGP were associated with higher odds of symptoms of depression.

Antenatal visits to address both emotional and physical needs should be encouraged among pregnant women in Nepal.

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