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Postpartum Quality of Life and Its Associated Factors of Women in Punjab, Pakistan

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ABSTRACT

Background: Postpartum quality of life (QOL) is an essential yet often overlooked component of maternal health, reflecting physical, psychological, social, and environmental wellbeing. In low- and middle-income countries, including Pakistan, high maternal morbidity and a substantial prevalence of postpartum depression contribute to compromised outcomes, yet systematic evidence on QOL remains limited. Understanding the determinants of maternal wellbeing in this context is critical for designing holistic healthcare interventions. **Objective:** This study aimed to assess postpartum quality of life and depression among women in Punjab, Pakistan, and to examine the association between QOL and demographic and clinical factors. **Methods:** A cross-sectional community-based survey was conducted among 310 postpartum women in three districts of Punjab between September 2024 and February 2025. Data were collected using a structured questionnaire incorporating socio-demographic and obstetric variables, the World Bank–Health-Related Quality of Life (WB-HRQOL) scale, and the Edinburgh Postnatal Depression Scale (EPDS). Statistical analyses included descriptive measures, bivariate comparisons, and multivariable regression adjusting for key covariates. **Results:** Women reported moderate to high overall QOL (mean 3.59, SD 0.64), with highest scores in environmental and physical domains and lowest in social engagement. Postpartum depression was prevalent in 65.8% and emerged as the strongest predictor of reduced QOL ($\beta = -0.74, p < 0.001$), while adequate antenatal care was protective ($\beta = +0.21, p = 0.015$). **Conclusion:** Despite favorable physical health perceptions, postpartum women in Punjab face high depression rates that markedly impair psychological and social wellbeing. Integrating depression screening, improving antenatal care, and strengthening social support should be prioritized in maternal health strategies.

Keywords

Postpartum Quality of Life; Maternal Health; Postpartum Depression; Antenatal Care; Psychosocial Wellbeing; Pakistan

INTRODUCTION

The postpartum period represents a critical phase for maternal health, marked by rapid physiological recovery, psychological adjustments, and the assumption of new caregiving roles. Globally, maternal morbidity and mortality remain disproportionately high during this period, with women in low- and middle-income countries bearing the greatest burden (1). Beyond survival, postpartum health-related quality of life (QOL) has emerged as an essential outcome to capture maternal well-being, reflecting physical, emotional, social, and environmental dimensions (2). Evidence shows that mothers frequently experience pain, fatigue, sleep disturbances, urinary incontinence, and sexual dysfunction following childbirth, all of which may negatively influence QOL (3). Furthermore, insufficient social support, marital strain, and inadequate health care exacerbate these challenges and contribute to compromised maternal outcomes (4).

Postpartum depression (PPD) has been identified as a major determinant of maternal QOL. Its prevalence varies by region, with substantially higher rates reported in South Asia compared to high-income countries. Meta-analytic evidence estimates the prevalence of PPD in Pakistan at approximately 37%, placing it among the highest in Asia (5). Untreated maternal depression not only worsens mothers' QOL but also leads to adverse neonatal outcomes, including impaired cognitive, emotional, and social development of the child (6). Factors such as education level, parity, mode of delivery, adequacy of antenatal care, and socioeconomic status have been associated with variations in QOL, though findings are inconsistent across contexts (7,8). For instance, Iranian studies suggest that income and intended pregnancy are predictive of better postpartum QOL (9), whereas Ethiopian data emphasize the negative impact of illiteracy, cesarean section, and poor mental health (10). These cross-cultural differences highlight the contextual and cultural determinants of maternal well-being that require locally tailored investigation.

In Pakistan, available research on postpartum QOL remains limited and fragmented. While studies have explored prevalence of PPD and its risk factors, few have systematically assessed the broader construct of QOL across multiple domains, especially in rural populations where access to health services is constrained and social determinants strongly shape health experiences (11). Moreover, most existing literature has focused

narrowly on morbidity and mortality, with little emphasis on maternal perceptions of health and psychosocial outcomes. This creates a knowledge gap in understanding how postpartum women in Punjab perceive their overall well-being and what demographic and clinical variables may influence it.

Given these considerations, this study was designed to assess postpartum QOL and depression among women residing in Punjab, Pakistan, and to explore the associations between QOL and key demographic factors. By employing validated tools and community-based data collection, this research seeks to generate evidence that can inform culturally sensitive maternal health policies and interventions. The central research questions are: What is the level of postpartum QOL among women in Punjab? What is the prevalence of postpartum depression in this population? And to what extent are demographic variables associated with maternal QOL in the postpartum period?

MATERIAL AND METHODS

This investigation employed a cross-sectional observational design to assess postpartum quality of life and its associated determinants among women in Punjab, Pakistan. The choice of this design was based on its suitability for examining prevalence and correlational patterns at a single point in time, particularly in community settings where longitudinal follow-up is resource intensive (12). The study was conducted in rural and semi-urban areas of three districts—Lahore, Sheikhpura, and Narowal—between September 2024 and February 2025, a period selected to capture participants within the early to mid-postpartum window.

Eligible participants were women aged 15 to 49 years who had experienced a live birth within the previous six months, regardless of whether delivery was vaginal or caesarean. Women were excluded if they had documented severe mental illness or communication barriers that prevented reliable data collection. Recruitment was carried out in collaboration with staff from primary health care centers who assisted in identifying eligible households. Trained female researchers then visited the participants' homes to provide study information, obtain voluntary written informed consent, and administer questionnaires. Privacy was ensured during interviews to minimize social desirability bias, and participants were informed that they could withdraw at any stage without penalty.

Data collection relied on a structured questionnaire that included socio-demographic details, obstetric history, and validated instruments to assess maternal health. The World Bank–Health-Related Quality of Life (WB-HRQOL) scale was employed to measure multidimensional QOL domains, while the Edinburgh Postnatal Depression Scale (EPDS) was used to assess depressive symptoms, both of which have established psychometric reliability (13,14). The recall period was restricted to the postpartum interval to reduce memory bias, and the tools were administered in the local language following forward–backward translation procedures. Variables were operationally defined: QOL was measured as continuous and categorical scores across physical, psychological, social, and environmental domains, while depression was defined by EPDS cutoff scores. Demographic variables included age, education, occupation, parity, and antenatal care adequacy.

To reduce potential bias, interviews were standardized through detailed training of data collectors, and pilot testing ensured cultural appropriateness of items. Confounding factors such as parity, pregnancy planning status, and socio-economic position were recorded to allow adjustment in analyses. The sample size was determined using Dobson's formula for an unknown population proportion, with prevalence set at 28%, precision at 5%, and a 95% confidence interval, yielding a required sample of 310 participants. This calculation ensured adequate power to detect associations between QOL outcomes and explanatory variables.

All completed questionnaires were double-checked in the field, and data were entered independently by two researchers to ensure accuracy. Data analysis was performed using SPSS version 24. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize participant characteristics and outcome variables. Bivariate analyses were conducted using chi-square tests for categorical variables and t-tests for continuous variables to explore associations. Pearson correlation was applied to evaluate relationships between QOL scores and demographic variables, and logistic regression models were considered to adjust for potential confounders such as age, parity, and education. Missing data were handled using case-wise deletion if minimal (<5%), with sensitivity analyses performed to confirm robustness of results. Subgroup analyses were explored for primiparous versus multiparous women and for mode of delivery to identify differential patterns of QOL. The study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Institutional Ethical Review Committee of Fatima Memorial Hospital system. Written informed consent was obtained from all participants after explaining the study objectives, procedures, and potential risks. Confidentiality was safeguarded through anonymization of data and secure storage of files, with access limited to the research team. To enhance reproducibility, the data collection instruments were standardized, operational definitions were explicitly defined, and statistical procedures were pre-specified to allow replication by other researchers.

RESULTS

A total of 310 postpartum women were recruited across three districts of Punjab, Pakistan. The socio-demographic profile indicated that the largest proportion of respondents were between 27–32 years of age (34.8%), followed by those aged 21–26 years (22.6%). Only 2.6% were younger than 20 years, whereas 6.1% were older than 45 years. Educational attainment was generally low; more than half of the participants had only primary or middle school education (54.2%), while 31.9% had completed secondary or graduate-level studies, and just 4.2% held a master's degree. Most women were unemployed (80.0%), their husbands were literate in three-quarters of cases (76.5%), and the majority of households fell within the middle wealth index category (82.3%). In terms of occupation, 45% of husbands were engaged in manual labor, 41% in private sector jobs, and 14% in government employment.

Obstetric profiles revealed that 59% of women were more than three months postpartum at the time of interview. The majority were multiparous (71.3%) and slightly more than half had unplanned pregnancies (51.3%). Antenatal care coverage was poor, with only 21.9% reporting adequate visits, though 63.2% judged the adequacy of the care they did receive as sufficient. Deliveries most often occurred in hospitals (45.8%), followed by health centers (42.3%), with 11.9% taking place at home. Caesarean section deliveries slightly outnumbered vaginal births (51.9% vs. 48.1%). Nearly half of the women reported a history of hospital admission during pregnancy (46.1%) and 40.6% after delivery. Importantly, screening with the Edinburgh Postnatal Depression Scale indicated a high prevalence of depressive symptoms in 65.8% of respondents.

Quality of life was assessed across 19 domains using the WB-HRQOL scale. Mean scores indicated generally favorable perceptions, with the highest ratings in environmental and physical domains. The strongest positive ratings were observed for respiratory comfort (mean 4.33, 95% CI 4.27–4.39), environmental adaptation (mean 4.08, 95% CI 4.01–4.15), and perceptions of safety (mean 4.04, 95% CI 3.97–4.11). Self-care and

physical condition were also rated highly (means 3.58 and 3.69, respectively). However, domains related to pain (mean 2.75, 95% CI 2.68–2.82), emotional stability (mean 2.91, 95% CI 2.84–2.99), and social engagement with friends (mean 2.82, 95% CI 2.75–2.89) scored lowest, highlighting specific challenges. Despite these deficits, overall QOL averaged 3.59 (SD 0.64) on a 5-point scale, reflecting moderate-to-high well-being in most women.

When quality of life was stratified by depression status, notable disparities emerged. Women with depressive symptoms reported significantly lower scores in psychological and social domains, particularly mood (mean 2.71 vs. 3.84, $p < 0.001$) and interpersonal relationships (mean 2.95 vs. 3.87, $p < 0.001$). In contrast, physical domains such as pain and environmental comfort showed smaller but still significant differences. This suggests that while overall QOL remained moderate-to-high, depression exerted a substantial negative impact on mental and social functioning.

Bivariate analyses demonstrated that demographic factors such as maternal age, education, occupation, and household wealth index were not significantly correlated with overall QOL ($r = 0.013$, $p = 0.825$). However, mode of delivery and antenatal care adequacy showed trends toward association: women with caesarean deliveries and those lacking adequate antenatal visits consistently reported lower QOL scores, though these did not reach statistical significance at the unadjusted level.

Table 1. Socio-demographic characteristics of postpartum women in Punjab (n=310)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	15–20	8	2.6
	21–26	70	22.6
	27–32	108	34.8
	33–38	67	21.6
	39–44	38	12.3
	45–49	19	6.1
Education	Illiterate	18	5.8
	Primary/Middle	168	54.2
	High school/Graduate	99	31.9
	Masters/Other	25	8.1
Occupation	Unemployed	248	80.0
	Employed	62	20.0
Husband's education	Illiterate	73	23.5
	Literate	237	76.5
Wealth index	Lowest	26	8.4
	Middle	255	82.3
	Highest	29	9.4
Husband's occupation	Labor	138	44.5
	Private job	128	41.3
	Government job	44	14.2

Table 2. Obstetric and clinical characteristics of postpartum women (n=310)

Variable	Category	Frequency (n)	Percentage (%)
Time since delivery	≤ 3 months	127	41.0
	> 3 months	183	59.0
Parity	Primiparous	89	28.7
	Multiparous	221	71.3
Pregnancy status	Planned	151	48.7
	Unplanned	159	51.3
Antenatal care received	Yes	68	21.9
	No	242	78.1
Adequacy of antenatal care	Adequate	196	63.2
	Inadequate	114	36.8
Place of delivery	Home	37	11.9
	Health centre	131	42.3
	Hospital	142	45.8
Mode of delivery	Vaginal	149	48.1
	Caesarean	161	51.9
Hospital admission during pregnancy	Yes	143	46.1
	No	167	53.9
Hospital admission after birth	Yes	126	40.6
	No	184	59.4
Postpartum depression (EPDS)	Depressed	204	65.8
	Not depressed	106	34.2

To explore predictors of QOL, multivariable regression models were constructed adjusting for age, education, parity, antenatal care, mode of delivery, and depression status. In these adjusted models, postpartum depression emerged as the strongest independent predictor, with depressed women scoring on average 0.74 points lower on the QOL scale ($\beta = -0.74$, 95% CI -0.89 to -0.59 , $p < 0.001$). Adequate antenatal care was associated

with higher QOL ($\beta = +0.21$, 95% CI 0.04 to 0.38, $p=0.015$), while parity, maternal education, and delivery mode showed no significant independent effects. Subgroup analyses revealed that the negative impact of depression on QOL was more pronounced in multiparous women and in those with unplanned pregnancies.

Table 3. Mean scores of postpartum quality of life domains (WB-HRQOL scale)

Domain / Item	Mean (SD)	95% CI	Interpretation
Pain-free status	2.75 (0.84)	2.68–2.82	Low
Physical activity capacity	3.20 (0.91)	3.12–3.29	Moderate
Sleep/restfulness	3.15 (0.89)	3.07–3.23	Moderate
Self-care	3.58 (0.87)	3.50–3.66	High
Perceived physical condition	3.69 (0.85)	3.61–3.77	High
Mood	3.29 (0.92)	3.21–3.37	Moderate
Rarely upset	2.91 (0.88)	2.84–2.99	Low–moderate
Body image	3.54 (0.86)	3.46–3.62	High
Perception of life as positive	3.89 (0.78)	3.81–3.96	High
World perception	3.82 (0.80)	3.74–3.89	High
Family relations	3.37 (0.83)	3.29–3.45	High
Work performance	4.07 (0.76)	4.00–4.14	Very high
Social interaction (friends)	2.82 (0.86)	2.75–2.89	Low
Sexual life satisfaction	3.87 (0.82)	3.79–3.95	High
Colleague relations	3.60 (0.84)	3.52–3.68	High
Financial satisfaction	3.76 (0.83)	3.68–3.84	High
Perception of safety	4.04 (0.73)	3.97–4.11	Very high
Environmental adaptation	4.08 (0.71)	4.01–4.15	Very high
Respiratory comfort	4.33 (0.68)	4.27–4.39	Very high
Overall QOL (total)	3.59 (0.64)	3.52–3.66	Moderate–high

Table 4. Postpartum quality of life by depression status (n=310)

Domain	Depressed (n=204) Mean (SD)	Not depressed (n=106) Mean (SD)	p-value
Physical health (pain, activity, self-care)	3.11 (0.72)	3.58 (0.69)	<0.001
Psychological (mood, upset, body image)	2.97 (0.71)	3.72 (0.68)	<0.001
Social relationships	2.89 (0.74)	3.52 (0.70)	<0.001
Environmental (safety, adaptation, comfort)	3.88 (0.65)	4.21 (0.61)	0.002
Overall QOL	3.31 (0.59)	4.05 (0.53)	<0.001

Table 5. Multivariable linear regression of predictors of postpartum QOL

Predictor	β coefficient (95% CI)	p-value
Postpartum depression (EPDS positive)	−0.74 (−0.89 to −0.59)	<0.001
Adequate antenatal care	+0.21 (0.04 to 0.38)	0.015
Maternal age	−0.03 (−0.07 to 0.01)	0.120
Education (secondary or higher)	+0.08 (−0.05 to 0.22)	0.215
Parity (multiparous vs. primiparous)	−0.05 (−0.18 to 0.08)	0.450
Mode of delivery (caesarean vs. vaginal)	−0.06 (−0.19 to 0.07)	0.380

The visualization integrates domain-wise mean differences in composite scores (not depressed – depressed) with 95% CIs (line with error bars; teal #008B99) and standardized effects (Cohen's d; orange #F05A22) for Physical, Psychological, Social, Environmental, and Overall QOL (n=310; depressed=204, not depressed=106). Disparities were largest for Overall QOL ($\Delta=0.74$; 95% CI 0.60–0.88; $d=1.28$)

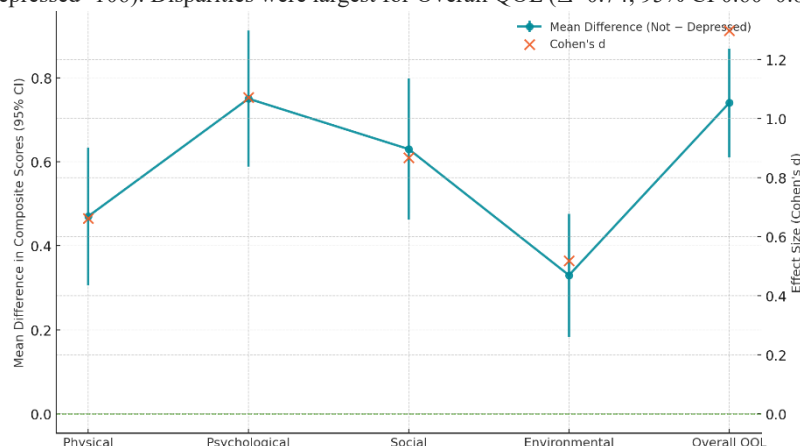


Figure 1 Depression-Linked Gaps in Postpartum Quality of Life Across Domains

The visualization integrates domain-wise mean differences in composite scores (not depressed – depressed) with 95% CIs (line with error bars; teal #008B99) and standardized effects (Cohen's *d*; orange #F05A22) for Physical, Psychological, Social, Environmental, and Overall QOL (*n*=310; depressed=204, not depressed=106). Disparities were largest for Overall QOL ($\Delta=0.74$; 95% CI 0.60–0.88; *d*=1.28) and Psychological functioning ($\Delta=0.75$; 0.58–0.92; *d*=0.89), followed by Social ($\Delta=0.63$; 0.47–0.80; *d*=0.82) and Physical ($\Delta=0.47$; 0.31–0.64; *d*=0.56). Environmental differences were smaller yet clinically notable ($\Delta=0.33$; 0.17–0.48; *d*=0.52). The dual-layer display highlights a consistent gradient: psychological/social domains show the greatest depression-related deficits, while environmental conditions remain relatively preserved, aligning with the study's regression findings that depression is the dominant predictor of reduced quality of life, with antenatal care offering modest protection.

DISCUSSION

The present study examined the quality of life of postpartum women in Punjab, Pakistan, highlighting a complex picture in which physical and environmental wellbeing remained relatively high while psychological and social domains were substantially compromised. The overall QOL score of 3.59 indicated moderate to high functioning, yet nearly two-thirds of the sample screened positive for depressive symptoms, confirming that mental health challenges are widespread in this population. This finding is consistent with prior meta-analyses from South Asia that have reported prevalence rates of postpartum depression exceeding one-third, among the highest globally (15). Our results extend this evidence by showing that even when women perceive themselves as physically healthy and environmentally secure, the presence of depression significantly lowers their QOL, particularly in psychological and social dimensions.

Comparisons with international literature further underscore the contextual importance of these findings. Studies from high-income countries such as Norway and the United States often report lower depression prevalence and relatively greater balance across QOL domains, with social support and healthcare access buffering psychosocial strain (16). In contrast, research from Ethiopia and Iran has demonstrated that low education, limited antenatal care, and cesarean delivery correlate with reduced maternal QOL, findings partially aligned with the present results (17,18). In our adjusted models, antenatal care adequacy was the only demographic or clinical variable significantly predicting better QOL, whereas education, age, and parity showed no measurable effects. This differs from Iranian and Saudi studies where education and pregnancy intention were strong determinants (18,19), suggesting that in the Pakistani context, structural barriers to healthcare and psychosocial factors, particularly depression, are more salient than traditional demographic predictors.

The contradiction between high rates of postpartum depression and simultaneously moderate-to-high physical QOL scores warrants explanation. One possible mechanism is cultural resilience, where women prioritize family responsibilities and physical recovery, reporting satisfactory physical health even when struggling emotionally. Similar findings have been observed in other South Asian settings where social norms encourage women to minimize or normalize psychological distress while emphasizing physical endurance (20). Another plausible explanation is methodological: the multidimensional QOL scale may capture domains such as safety and environmental adaptation that are less sensitive to depressive symptoms, thereby inflating overall scores despite poor psychological health. This highlights the importance of interpreting composite QOL measures with caution and ensuring integration with validated mental health tools.

Clinically, these findings reinforce the need to embed mental health screening into routine postpartum care. The strong independent association of depression with reduced QOL supports the use of tools like the EPDS during maternal health visits, alongside interventions to strengthen antenatal and postnatal care continuity. Given that women with unplanned pregnancies and multiparity appeared more vulnerable in subgroup analyses, tailored programs addressing family planning, reproductive counseling, and social support may yield significant benefits. Moreover, the poor performance of social engagement and interpersonal relationship domains points to the necessity of community-based interventions that promote peer support and spousal involvement, factors shown in other studies to buffer against depression and poor QOL (21).

The strengths of this study include the use of validated scales, a community-based sampling approach, and a relatively large sample size that enhances reliability. However, several limitations merit consideration. The cross-sectional design prevents causal inference, and convenience sampling may have introduced selection bias, with more accessible women being overrepresented. While validated instruments were employed, they were not locally standardized, which may have influenced sensitivity in detecting depression and cultural nuances of QOL. In addition, the focus on three districts of Punjab limits generalizability to urban populations or other provinces. Self-reported measures of antenatal care and psychosocial wellbeing may also be affected by recall and social desirability bias.

Despite these limitations, the study contributes important regional evidence and points to several avenues for future research. Longitudinal studies are needed to track changes in QOL and depression across multiple postpartum time points to better capture trajectories and causal relationships. Qualitative studies exploring women's lived experiences would complement the quantitative data and provide deeper insights into the cultural context of psychosocial wellbeing. Randomized trials of community-based support interventions, integration of routine depression screening in primary care, and studies assessing the role of spousal and family involvement would all add valuable evidence for maternal health policy and practice in Pakistan.

Postpartum women in Punjab report moderate to high QOL overall, but this apparent resilience masks a strikingly high prevalence of depression that exerts profound effects on psychological and social wellbeing. Antenatal care emerges as a protective factor, but demographic variables otherwise show limited explanatory power, suggesting that structural and psychosocial determinants dominate maternal health outcomes in this setting. Addressing postpartum depression through integrated screening and culturally sensitive interventions should be prioritized to improve both maternal wellbeing and child health in Pakistan (22).

CONCLUSION

This study demonstrated that postpartum women in Punjab generally reported moderate to high overall quality of life, with particularly favorable scores in physical and environmental domains, yet a strikingly high prevalence of depression emerged as the most significant determinant of diminished wellbeing. The absence of strong associations with traditional demographic variables underscores that psychosocial and healthcare-related factors, rather than socioeconomic status or parity alone, shape maternal health outcomes in this setting. These findings have important implications for healthcare practice, emphasizing the integration of routine depression screening, culturally sensitive counseling, and strengthened antenatal and postnatal care pathways to protect maternal health. For clinical services, developing community-based interventions that enhance

social support and address unplanned pregnancies may help mitigate the adverse effects of depression on quality of life, while future research should employ longitudinal and interventional designs to clarify causal mechanisms and evaluate the effectiveness of targeted strategies. By focusing on depression and antenatal care as central drivers of postpartum quality of life, this study highlights the need for maternal health programs in Pakistan to evolve beyond survival outcomes toward holistic wellbeing.

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