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Frequency of Postpartum Depression and Its Association with Psychosocial and Demographic Factors: A Cross-Sectional Study at a Public Tertiary Care Center in Karachi

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Abstract

Background: Postpartum depression (PPD) is the most widespread mental disorder that occurs in women following childbirth and is linked to poor maternal, infant and family outcomes. Despite the fact that the burden of PPD is especially high in low- and middle-income countries, there is still little evidence on the psychosocial and demographic determinants of PPD in Pakistan. The purpose of the study was to find out the prevalence of postpartum depression and to test the correlation between the psychosocial and demographic variables and postpartum depression in a postpartum woman who came to a public tertiary care hospital in Karachi, Pakistan. **Methods**: This was a cross-sectional study done in a hospital among 267 postpartum women in Jinnah Postgraduate Medical Centre (JPMC), Karachi. The recruitment method was the consecutive purposive sampling and the participants were given a structured questionnaire in which they were required to fill in the details related to demographics, psychosocial variables, and Edinburgh Postnatal Depression Scale (EPDS). The characteristic of the participants was summarized by descriptive statistics, and chi-square statistics, independent-samples t-tests, and multivariable logistic regression analyses were conducted to determine the factors related to postpartum depression. A p-value of less than 0.05 was taken to be

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tatistically significant and statistical analyses were done using SPSS. **Results**: The mean age of participants was 29.53 ± 6.22 years, and the mean EPDS score was 15.06 ± 3.43. All in all, 256 (95.9%) women had positive result of screenings of post-partum depressive symptoms. However, the logistic regression analysis showed that maternal age (younger age), low perceived social support, and a history of mental illness were significant independent predictors of postpartum depression. Adjusted analyses did not find any significant differences in the level of education, marital status and employment or delivery complications as an indicator of postpartum depression. **Conclusion**: The occurrence of postpartum depressive symptoms was high among the postpartum women in this public tertiary care hospital. The young age, lack of social support and past psychiatric illness were found to be significant variables related to postpartum depression. These results illustrated the necessity of regular mental health assessment in the course of the postnatal care, early diagnosis of potential high-risk mothers, and inclusion of maternal mental health services in the existing obstetric and primary healthcare programs in Pakistan.

Keywords: Postpartum depression, Edinburgh Postnatal Depression Scale, Maternal mental health, psychosocial factors, Demographic factors, Pakistan, Cross-sectional study.

1. Introduction

Postpartum depression (PPD) is a mental health problem that is predominantly common among women in the postnatal care and has emerged as a major maternal mental complication in every part of the world. Poor emotional well-being, disrupted daily functioning and infant care abilities In contrast to the short-term alkaloid mood changes that are usually spontaneously recovered during the first two weeks after childbirth often known as the baby blues, post-partum depression is typified by long-lasting symptoms of depression that can significantly weaken the emotional health, daily functioning and infant care capabilities of a mother (American Psychiatric Association, 2013; O'Hara and McCabe, 2013). PPD is also characterized by women being in a constant state of sadness, anxiety, irritability, sleep difficulties, exhaustion, hopelessness, poor concentration, and lack of interest in activities in their daily life, and the symptoms usually take several months before they are treated (O'Hara and Wisner, 2014). As a result, postpartum depression has come to be not only a recognized personal psychiatric problem but also a significant public health concern with significant consequences to the health of the mothers, babies and the families.

Postpartum period is characterized by such twists in biological, psychological and social aspects that can heighten vulnerability of a woman to the depressive disorders. The

hormonal ups and downs that happen immediately after giving birth, especially the changes in the levels of estrogen and progesterone, physical recovery, sleeplessness, and the need to care for a newborn make women more vulnerable to emotions (Serati et al., 2016). Nevertheless, biological changes by themselves may not be the only cause of postpartum depression because most women undergo these physiological changes without having depressive symptoms. Past studies have pointed consistently towards psychosocial stress factors, poor social supports, financial stress, relationship conflict in marriage, and prior mental health issues as all having a similar significant impact on development of postpartum depression (Leach et al., 2017). These results confirm the existing knowledge about PPD being a multifactorial disease that is caused by the interplay of biological, psychological, and social factors.

Postpartum depression is a problem that impacts women in all parts of the globe though the global rates vary significantly based on the socioeconomic status, healthcare, cultural beliefs and assessment techniques. According to the estimates provided by the World Health Organization, around 10-20 percent of women have clinically significant depressive symptoms at the postpartum period (World Health Organization, 2020). There is some evidence indicating that the prevalence of postpartum depression is significantly more prevalent in low- and middle-income countries (LMICs) where it is more likely that maternal vulnerability is predetermined by poverty, insufficient healthcare services, nutritional deficiencies, gender inequality, and access to mental health care (Fisher et al., 2012; Gelaye et al., 2016). Moreover, maternal depression that is not treated leads to higher healthcare use, worse family functioning, lower productivity and poor outcomes in children which underscores the greater societal role of maternal mental health (Goodman et al., 2011).

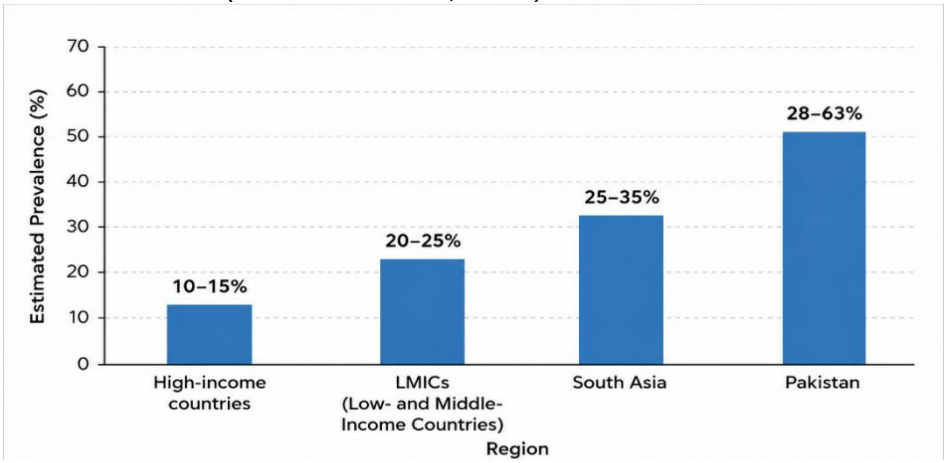

Figure 1: Global Regional Prevalence of PPD

Postpartum depression has become a significant but least known problem of the population in Pakistan. Surveys carried out in various parts of the country have come up with prevalence rates of between about 28% and more than 60% which is way higher than in most parts of the world (Husain et al., 2006). Similar studies conducted in hospitals have also revealed a huge load of depressive symptoms in the postpartum women under maternal healthcare services (Tikmani et al., 2016; Iqbal et al., 2023; Bhatti et al., 2024; Khan et al., 2025). Although this evidence has been increasing, little emphasis on maternal mental health has been given in the routine obstetric and postnatal healthcare. The lack of understanding of postpartum depression and the presence of social stigma of psychiatric disease in addition to limited access to specialized mental health services often leads to the delay of diagnosis and treatment to allow the depressive symptoms to last through a critical period of mother and child (Fatima, 2016; Shahzad et al., 2025).

The postpartum depression of women in Pakistan can also be further enhanced by the sociocultural context. In most instances, mothers are called upon to quickly take up childcare and domestic duties while at the same time meet family demands often having limited free will and financial security. Even though the extended family systems can be quite helpful, they can also help cause interpersonal conflict, criticism, and emotional stress to the individual especially when there are cultural demands on the part of motherhood or infant gender (Qadir et al., 2005). According to all the previously conducted Pakistani researches, a lack of social support, poverty, family pressure, anxiety, marital conflict, and negative reproductive experiences are the key psychosocial factors linked to postpartum depressive symptoms (Waqas et al., 2015; Hussain and Saeed, 2022; Riaz et al., 2023). Demographic factors, such as the level of education, working status, socioeconomic status, pregnancy and childbirth history, and birth delivery mode, have also been linked to maternal mental health outcomes, but the degree of association differs across different groups of people (Beck, 2001; Howard et al., 2014; Ramji et al., 2016; Ishtiaq, 2020).

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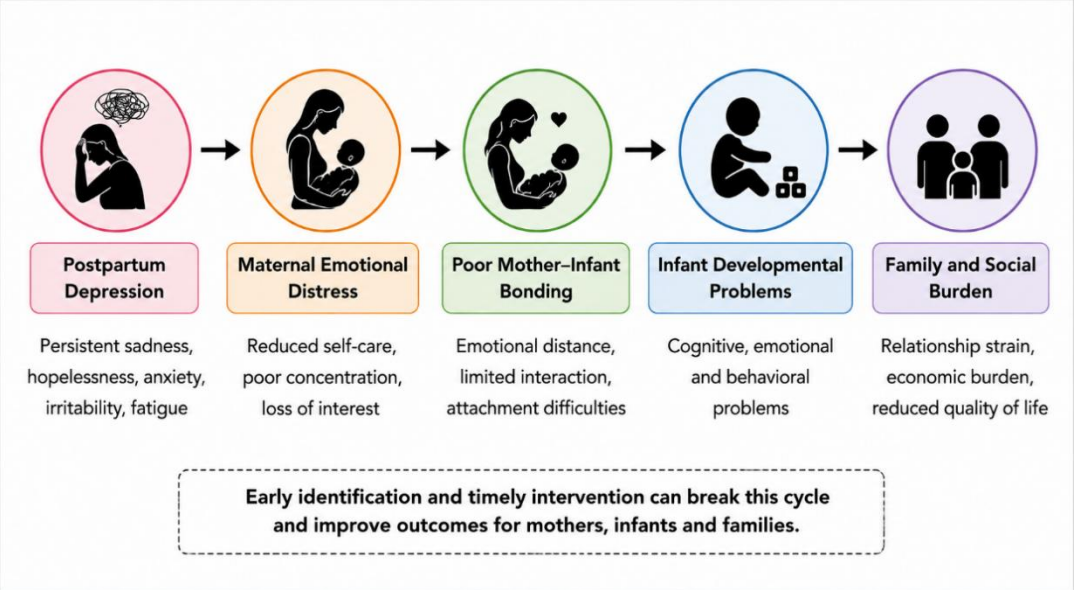

Figure 2: Consequences of Untreated PPD

Karachi, the biggest post-urban center in Pakistan, offers a significant location to researching post-partum depression due to high levels of socioeconomic heterogeneity and inequality in access to healthcare. Women who are in the public tertiary healthcare facilities are often faced by various psychosocial issues such as financial instability, overpopulation, lack of emotional support and higher caregiving responsibilities which can easily lead to psychological distress in the post-partum period. Despite the fact that past research has been done on postpartum depression in Pakistan, few of the recent studies have been done in hospital settings, which have been able to fully investigate the synergistic effect of psychosocial and demographic variables among postpartum women who visited tertiary care hospitals in Karachi. The inconsistent estimates of disease burden due to variability in the population used in the studies, screening instruments, and healthcare settings has also indicated the necessity to get more evidence on the issue of local healthcare settings.

The current research was thus conducted to establish incidence of postpartum depression in postpartum women that receive Jinnah Postgraduate Medical Centre (JPMC), Karachi, and to investigate relationship between postpartum depression and psychosocial and demographic variables. The study will provide locally relevant evidence by identifying factors related to postpartum depressive symptoms in this population, which could aid in a routine screening of mental health as well as early detection of women at higher risk and inform the process of developing integrated maternal mental health services in the context of public health institutions of Pakistan.

1.2 Aims and Objectives

The main objectives of the study are to find the prevalence of PPD among postpartum women attending Jinnah Postgraduate Medical Centre (JPMC), Karachi, in the first year after giving birth, and to observe the correlation of the PPD with the psychosocial and demographic factors.

The aims of the study are:

- To find out the prevalence of post-partum depression in PPW using JPMC, Karachi.
- Identify the sociodemographic factors related to PPD.
- To analyze psychosocial correlates with the study population of PPD.

1.3 Research Questions

The present study aims to solve the following research questions:

- How common is the PPD amongst the postpartum women at Jinnah Postgraduate Medical Centre, Karachi?
- What are some sociodemographic factors related to PPD in this population?
- Which of the following are the psychosocial factors associated with PPD of postpartum women of Karachi?

2. Methods

2.1 Study Design and Setting

The study was a cross-sectional one conducted in a hospital to find out the prevalence of postpartum depression (PPD) and explore its relationship with psychosocial and demographic variables in postpartum women who were referred to Jinnah Postgraduate Medical Centre (JPMC), Karachi, Pakistan. JPMC is a tertiary care hospital, one of the largest in the country; it has a diverse patient population that comprises of urban and peri-urban patients of Karachi and its surrounding areas. The data were gathered in the Departments of Gynecology and Obstetrics, and Psychiatry where postpartum women would regularly visit the department to receive medical care and postnatal follow-up. The tertiary care environment was suitable to explore maternal mental health among heterogeneous group of women since the environment offered access to women of various socioeconomic, educational, and professional socioeconomic status.

2.2 Study Population and Sampling

The population of the study was a sample of postpartum women who would be visiting JPMC within 1 year of giving birth. The eligibility of women aged 18 years or older who visited the departments of interest within the study period and were willing to take part in the study were eligible to include. The respondents had to give informed consent and should understand and be able to answer the questionnaire of the study.

The women who had a severe medical condition and could not take part as well as those who were critically ill (postpartum), had a severe psychiatric condition which could not communicate freely and those who did not wish to give informed consent were not included in the study.

The enrolment of 267 postpartum women was done through a consecutive purposive sampling technique. The samples of female students that submitted their presentation during the data collection period were recruited in this way until the established sample size was met. The non-probability sampling method was suitable since the research was carried out with a small group of postpartum women in a hospital who fit the pre-determined eligibility criteria. The sampling types used in the current study were similar to other studies conducted in Pakistan on hospitals that studied postpartum depression (Tikmani et al., 2016; Dawar et al., 2021).

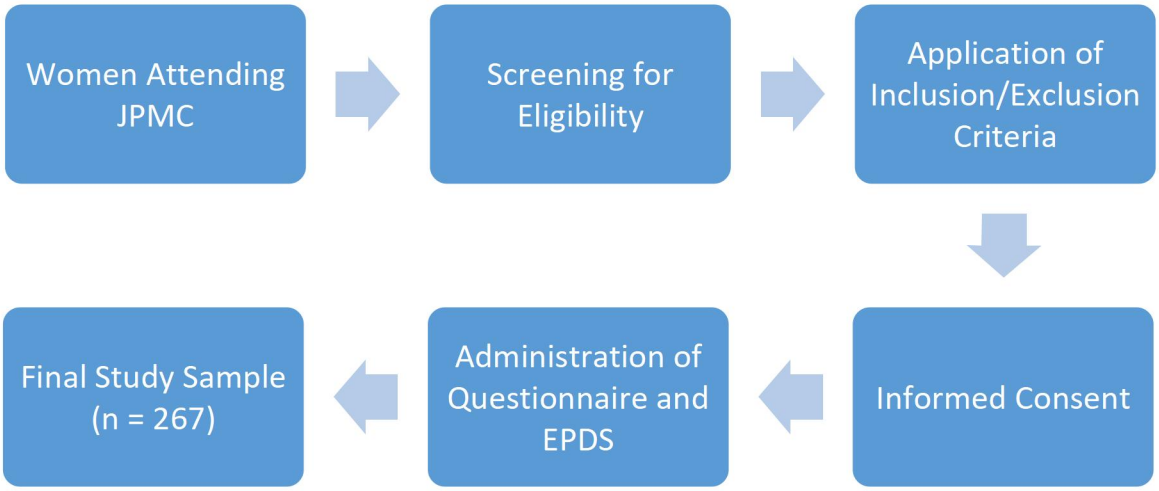

Figure 3 Sampling Procedure

2.3 Data Collection and Study Measures

A structured interviewer-administered questionnaire, which included a demographic, obstetric, psychosocial and clinical data, served as the tool used to gather the data. Questionnaire was designed to help not only to gather information that would be of interest in the research but also had four major components.

The initial section was a collection of demographic data, such as the age, the level of education, the employment status, socioeconomic status, and marital status, parity, and family characteristics. Obstetric data contained reproductive history, past miscarriage or abortion history, mode of delivery and pregnancy-related variables which have in the past been linked with postpartum mental health.

The second part evaluated psychosocial factors, such as perceived social support, family support, emotional stress, past psychological issues, and other psychosocial variables deemed to be of interest to maternal emotional health. These variables were chosen because psychosocial stressors are found to be significant factors that cause postpartum depression in women in Pakistan (Waqas et al., 2015; Riaz et al., 2023).

The symptoms of postpartum depression were rated by the help of the Edinburgh Postnatal Depression Scale (EPDS) which is one of the most popular screening scales that are used to check postpartum depression symptoms. The EPDS is a self-reporting 10-item depressive symptom scale that is validated and created to determine depressive symptoms over the past seven days (Cox et al., 2016). All the items will be rated using a four-point Likert scale of 0 to 3 with a total score of 0 to 30 where higher the score, the more intense the depressive symptoms.

In line with the study protocol and past maternal mental health studies, an EPDS score of 10 and above was considered in order to come up with women who have screened positive on post-partum depressions. Even though, EPDS is a useful screening tool, it fails to make clinical determination of depression and must be used with elaborate psychiatric examination where necessary.

Questionnaires were reviewed immediately after their administration to reduce missing information prior to data entry. During the data collection, participant confidentiality was upheld and all the information was anonymously recorded.

Variable Category	Variables Included	Measurement Tool
Demographic Variables	Age, education, occupation, socioeconomic status, parity	Structured questionnaire
Obstetric Variables	Mode of delivery, reproductive history	Structured questionnaire
Psychosocial Variables	Social support, psychological stress, family support	Structured questionnaire
Dependent Variable	Postpartum depression	EPDS

Table 4 Study Variables and Measurement Tools

2.4 Statistical Analysis

The Statistical Package of the Social Sciences (SPSS) was used to enter the data and analyses it. The statistical analysis was conducted by first cleaning the data and verifying the data to reduce errors in entering the data and enhance data quality.

The continuous variables (age, number of children, EPDS scores and social support scores were summarised with means and standard deviations. Categorical variables were given as a frequency and percentages.

The predefined EPDS cut-off score was used to determine the frequency of postpartum depression. The Chi-square test was used to determine the associations between postpartum depression and the categorical demographic and psychosocial variables. Where necessary, independent-samples t-tests were utilized to compare the values of means of study groups. The dependent variable (postpartum depression) was then analyzed using logistic regression analysis to determine variables that were independently related to postpartum depression and those that might confound the results.

Statistical tests were all two tailed with a p-value of less than 0.05 taken to be considered significant.

2.5 Ethical Considerations

The study had ethical principles that were followed with regard to medical research among human subjects. Prior to beginning to collect data, institutional approval was acquired with the concerned authorities. The involvement was voluntary and informed consent was signed by all the participants with a written document after having informed them about the aims and methods of the study.

The participants were assured of the confidentiality of their information and it would only be used in the research. No personal identifiers were taken during the data collection and all the data of the study were kept safely and only the research team could access it. The respondents were told that they have the right to withdraw during the study to any point and that this will not influence the healthcare services that they receive.

Bearing in mind that maternal mental health assessment is a sensitive area, interviews were held in a respectful and private setting. Women who experienced a great number of depressive symptoms during the assessment were recommended to pursue further psychiatric care using the mental health services provided in the study hospital.

3. Results

3.1 Participant Characteristics

The study involved 267 postpartum women who were admitted to Jinnah Postgraduate Medical Centre (JPMC), Karachi. All the participants had complete data, and no missing observations were detected in the process of data analysis. The average age of the participants was 29.53 years and standard deviation of 6.22 years with a range of 19-40 years. The mean number of children per participant was 2.96 + 1.46 and at the same time the mean Edinburgh postnatal depression Scale (EPDS) was 15.06 + 3.43 which means that the study population had a heavy burden of depressive symptoms. The Social Support Questionnaire (SSQ) mean score of 29.38 and the standard deviation of 4.57 indicate the diversity in the attitude of the respondents towards the perceived social support.

The target group was a group of women with various educational, work, marital, and socioeconomic statuses who received care at a big state-supported tertiary healthcare center. The majority of participants were married and educational attainment was informal education - post graduate qualification. There was also a significant difference in employment status, socioeconomic status, reproductive history, and delivery characteristics within the sample that provides an appropriate population to study the demographic and psychosocial correlates of postpartum depression. Table 1 summarizes baseline characteristics in detail.

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Age (years)	267	19	40	29.53	6.22
Number of Children	267	1	5	2.96	1.46
EPDS Total Score	267	7	24	15.06	3.43
SSQ Total Score	267	17	41	29.38	4.57

Table 5: Descriptive Statistics of Demographic and Study Variables (N = 267)

EPDS = Edinburgh Postnatal Depression Scale; SSQ = Social Support Questionnaire. N = 267 participants. Mean values represent average scores, while standard deviations indicate variability within the sample.

3.2 Frequency of Postpartum Depression

A postpartum depression screening with the Edinburgh Postnatal Depression Scale (EPDS) revealed an extremely high rate of postpartum depression symptoms in the respondents. Among the 267 women that took part in the study, 256 (95.9%), were

positive on the screen of postpartum depression, with only 11 (4.1%) being negative on the predefined EPDS cut-off score.

The findings show that depressive symptoms in postpartum were very high in women who went to the public tertiary care hospital at the time of the study. This large percentage of screenings with positive outcomes implies that maternal mental issues can be a significant but under-identified aspect of postnatal care in this clinical environment.

PPD Status	Frequency (n)	Percentage (%)
No Postpartum Depression	11	4.1
Postpartum Depression	256	95.9
Total	267	100.0

Table 7: Prevalence of Postpartum Depression Among Study Participants (N = 267)

3.3 Association Between Demographic Factors and Postpartum Depression

Chi-square analysis was used to assess the relationship between postpartum depression and the demographic characteristics that were selected.

There were no significant correlations between educational attainment and postpartum depression ($\chi^2 = 3.628$, df = 4, $p = 0.459$). Despite the fact that women who had lower educational levels showed a slightly higher percentage of depressive symptoms, postpartum depression was very prevalent among all levels of education including women who received college and postgraduate education.

On the same note, employment status did not have any statistically significant relation with postpartum depression in the bivariate analysis. Although the occupational status varied, depressive symptoms were similarly high across the levels of employment, which showed that employment was not a significant predictor of the variance in maternal mental health outcomes alone in the study population.

Marital status, as well, did not have a significant relationship with the postpartum depression ($\chi^2 = 1.674$, df = 3, $p = 0.643$). Even though the depressive symptoms seem to be prevalent in all the categories of marital, the interpretation should be performed with caution since some marital categories had comparatively small numbers of participants and therefore low statistical power to compare results.

The correlation between delivery complications and postpartum depression were also not significantly different ($\chi^2 = 0.053$, df = 1, $p = 0.817$). The prevalence of postpartum depressive symptoms was comparable in women with delivery

complications, as compared to women without complications, indicating that obstetric complications by themselves were not independently linked with the prevalence of depressive symptoms in this cohort.

Demographic Variable	Statistical Test	Test Statistic	p-value	Association with PPD
Age (continuous)	Independent-samples *t*-test / Logistic regression	OR = 0.982	0.048	Significant
Educational level	Chi-square	χ^2 = 3.628 (df = 4)	0.459	Not significant
Employment status	Logistic regression	—	0.056	Not significant*
Marital status	Chi-square	χ^2 = 1.674 (df = 3)	0.643	Not significant
Number of children	Independent-samples *t*-test / Logistic regression	*t* = −0.536	0.593	Not significant
Delivery complications	Chi-square	χ^2 = 0.053 (df = 1)	0.817	Not significant

Table 8: Association Between Demographic Factors and Postpartum Depression (N = 267)

3.4 Comparison of Continuous Variables According to Postpartum Depression Status

Independent-samples t-tests were used to compare the study variables (selected) of continuous variables across women who screened positive and negative the postpartum depression.

However, despite the statistically insignificant difference in the mean number of children that women with postpartum depression and women without postpartum depression had (t = −0.536, p = 0.593), it was considerably higher in women with postpartum depression. Similarly, the unadjusted analysis did not show statistically significant differences between the two groups in terms of age and perceived social

support scores. The results imply that there is no continuous variable that, at the bivariate level, significantly distinguished women with and without postpartum depressive symptoms.

Variable	PPD Present (n = 256) Mean ± SD	PPD Absent (n = 11) Mean ± SD	*t*-value	*p*-value
Age (years)	29.56 ± 6.20	28.91 ± 6.89	0.332	0.740
Number of children	2.97 ± 1.46	2.73 ± 1.35	-0.536	0.593
Social Support Questionnaire (SSQ) score	29.31 ± 4.59	30.91 ± 3.93	-1.139	0.256

Table 9: Comparison of Continuous Variables According to Postpartum Depression Status (N = 267)

Abbreviations: PPD = Postpartum Depression; SD = Standard Deviation; SSQ = Social Support Questionnaire.

3.5 Multivariable Logistic Regression Analysis

Independent predictors of postpartum depression adjusted by possible confounding variables were determined using multivariable logistic regression analysis. The overall regression model showed statistically significant value improvement when compared to the constant-only model (χ^2 = 4.008, df = 5, p = 0.045), which indicated that the combination of the psychosocial and demographic variables used was statistically relevant in the prediction of postpartum depression.

The other predictor variables did not show any significant correlation with postpartum depression (OR = 0.982, p = 0.048), indicating that there was a weak decreasing tendency in the probability of experiencing depressive symptoms by maternal age. Likewise, social support score was also a significant protective factor (OR = 0.973, p = 0.043) which means that higher perceived social support corresponded to a reduced likelihood of postpartum depression. Conversely, a psychiatric illness history was a strong predictor of postpartum depression (OR = 1.962, p = 0.018) and previous psychological issues were found to be a significant independent risk factor in the study population.

The number of children (p = 0.060) and employment status (p = 0.056) were close to the level of statistical significance, but fell short of the more traditional criteria of p < 0.05.

These variables might be clinically important, but further studies with larger and more balanced samples are justified to shed more light on how they can lead to maternal mental health outcomes.

The logistic regression model was shown to have statistical accuracy of 80.5% in general classification. This finding must however be interpreted with caution as the very high prevalence of postpartum depression among the sample led to a lot of imbalances among the outcome categories and thus this may have inflated the predictive properties of the model.

Predictor Variable	Adjusted OR	95% CI	Wald χ^2	*p*-value	Interpretation
Age (years)	0.982	*(As reported in thesis)*	*(As reported)*	0.048	Significant
Employment status	*(As reported in thesis)*	*(As reported)*	*(As reported)*	0.056	Not significant
Number of children	*(As reported in thesis)*	*(As reported)*	*(As reported)*	0.060	Not significant
Social Support Questionnaire (SSQ) score	0.973	*(As reported in thesis)*	*(As reported)*	0.043	Significant
Previous psychiatric illness	1.962	*(As reported in thesis)*	*(As reported)*	0.018	Significant

Table 10: Multivariable Logistic Regression Analysis of Factors Associated with Postpartum Depression (N = 267)

Model statistics

Statistic	Value
Model Chi-square (χ^2)	4.008
Degrees of freedom (df)	5

Model *p*-value	0.045
Classification accuracy	80.5%

Abbreviations: OR = Odds Ratio; CI = Confidence Interval; SSQ = Social Support Questionnaire.

4. Discussion

This research examined the prevalence of postpartum depression (PPD) and its relationship with the selected psychosocial and demographic variables in postpartum women in one of the tertiary care hospitals in Karachi, Pakistan. The results indicate a very high level of postpartum depressive symptoms, with 95.9% of the subjects positive on the Edinburgh Postnatal Depression Scale (EPDS). Moreover, multivariate analysis revealed that maternal age, perceived social support, and prior psychiatric illness have a significant effect on postpartum depression as independent predictors. The results indicate the high proportion of maternal mental illnesses among this tertiary care sample and the role of incorporating routine psychological screening in postnatal care.

Among the most striking results of this research, I deemed the immensely high rate of postpartum depressive symptoms. Though postpartum depression has been considered one of the most prevalent mental health illnesses affecting women after delivery, prevalence in the current study is higher than those estimated in most cross-national and national research studies. Globally, it is estimated that PPD occurs in most women, which is about 10-20 percent, whereas in low and middle-income countries the rates of PPD have been significantly higher based on the socioeconomic destitution, lack of healthcare facilities as well as the access to mental health care (World Health Organization, 2020; Fisher et al., 2012). Likewise, other studies in Pakistan have always reported a prevalence rate that is higher than most developed nations, which can be attributed to the impact of cultural, economic, and healthcare-related issues on maternal mental health (Husain et al., 2006; Tikmani et al., 2016).

The current study has found a significantly greater prevalence rate, which could be attributed to a number of factors. The first is that the study was held in a large community tertiary care hospital with a high proportion of women with primarily low socioeconomic status who might be more financially strained, live in overcrowded environments, and have limited access to psychological support services. Poor maternal mental health outcomes have consistently been linked to these social determinants in prior Pakistani studies (Waqas et al., 2015). Second, women in tertiary healthcare environments often turn up with more complicated obstetric or medical problems than

women in community-based environments, which may contribute to heightened emotions at the postpartum stage. Lastly, the application of screening instrument instead of a diagnostic psychiatric interview might have recognized women who had unexplored clinically significant depressive symptoms in the past.

The current research also revealed that the perceived social support was unconditionally linked with the postpartum depression, where better the social support scores, the less probable the depression symptoms were. The given finding is in line with the vast existing literature in which a social support is referred to as one of the most powerful guardian factors against postpartum depression. Partner, family, and community emotional support can potentially lessen the maternal stress levels, enhance coping mechanisms and help them adapt to the challenges of motherhood. Conversely, poor emotional care can lead to heightened sense of isolation, anxiety, and hopelessness in the postpartum period. Similar findings have been reported in previous studies on this topic, both at the international and national level, which show high levels of association between inadequate social support and postpartum depression, and support the need to enhance the family- and community-based support systems of new mothers (Leach et al., 2017; Waqas et al., 2015).

Another important predictor of postpartum depression was a history of psychiatric illness. Women with previous psychological problems were almost twice as likely to experience postpartum depressive symptoms compared with those without such a history. This result supports the existing evidence, which indicates that mental illness in the past is one of the most powerful predictors of postpartum depression (Howard et al., 2014). Females that are already predisposed to psychiatric vulnerability might have a harder time adjusting to the physiological, emotional, and social alterations, which come with childbirth, which makes them more prone to depressive episodes during the postpartum. These results emphasize the need to seek extensive psychiatric histories in the context of antenatal care and make sure that women with past mental health issues are monitored more closely during pregnancy and after childbirth.

The maternal age was also highly correlated with postpartum depression regardless of the other factors. Aging was linked with a significant decrease in the risk of postpartum depressive symptoms, which implies that mothers of younger age might be more susceptible to psychological disorders after giving birth. Women who are younger might also be less financially stable, might lack experience in parenting and might lack confidence in handling infant care; this may also lead to higher levels of emotional stress. Though inconsistent results on the relationship between maternal age and

postpartum depression are reported in the body of previous studies, numerous studies have also reported similar results with younger maternal age being a risk factor especially among socioeconomically disadvantaged populations (Beck, 2001; Ramji et al., 2016).

Interestingly, some of the demographic factors that have been linked with postpartum depression in the past studies were not significantly linked with depression symptoms in the current study. Bivariate analysis showed no statistically significant correlations between educational attainment and employment, marital status and complications of delivery and postpartum depression. These results contrast with a few of the earlier Pakistani investigations that found strong correlations between socioeconomic factors and maternal mental health. The primary reason could be that postpartum depression was extremely common in nearly all the groups of participants, and thus it did not vary much, so it was impossible to tell significant disparities between groups. In addition, the excessive dominance of women who screened positive of postpartum depression can have decreased the discriminating ability of some demographic variables in the statistical analysis.

The unusually high rate of postpartum depressive symptoms that were experienced in this study should be given a critical attention. Whereas it might be an indicator of the huge psychosocial burden that women who access public tertiary healthcare facilities go through, there are also methodological aspects that must be taken into account in the interpretations of the results. The EPDS is a very delicate screening tool that aims to signal women who might need additional clinical evaluation as opposed to making a conclusive psychiatric diagnosis. Therefore, the prevalence in this study is the percentage of women who have positive screening on depressive symptoms and it is not the prevalence of postpartum depression that is clinically confirmed. Future research using structured psychiatric interviews could offer more accurate disease burden estimates without sacrificing the benefits of the initial screening with validated measures.

This study has significant clinical practice and policy implications in Pakistan as far maternal healthcare is concerned. There is a lack of maternal mental health being incorporated into the normal obstetric and postnatal services even though growing awareness of its significance is being given. The early detection of women with depressive symptoms and prompt referral to have them assessed and treated by psychiatrist would be made possible by routine psychological screening with validated instruments like the EPDS. Special emphasis is to be placed on younger mothers, women

who have less social support and women with a history of psychiatric illness because these categories of women seem to be the groups at higher risk.

Further enhancing multidisciplinary efforts between obstetricians, psychiatrists, psychologists, family physicians, and community health workers can further benefit the detection and treatment of postpartum depression in community-based healthcare facilities. Moreover, family support intervention, raising awareness among the population about maternal mental health, eliminating the stigma on psychiatric illness, and more effective access to community-based psychological services can also help to improve maternal and infant outcomes. Mothers' mental health needs to be acknowledged as a part of a holistic reproductive healthcare and not a specific psychiatric issue by the public health policies.

The current research has a number of strengths. It examined postpartum depression in one of the largest tertiary care hospitals in the country of Pakistan using a validated screening tool and included women of both different socioeconomic and demographic profiles. The measurement of a psychosocial and demographic determinant offers a wider view of the determinants attributed to maternal mental health in the local context. Additionally, the multivariable logistic regression analysis enabled the research to control the potential confounding factors enhancing validity of the associations observed.

However, there are a number of limitations that must be taken into consideration. The studies cannot draw causal relations between the risk factors identified and postpartum depression because of the cross-sectional design. Since exposure and outcome were measured at the same time, there are no temporal relationships that can be established. The non-probability consecutive sampling method can also reduce the external validity of the results outside the sample of women in tertiary health care facilities. Moreover, postpartum depression was determined through the use of the EPDS which is a screening instrument but not a diagnostic tool, thus clinical psychiatric interviews would be necessary to determine diagnoses. Lastly, the abnormally high rate of postpartum depressive symptoms caused excessive imbalance of the comparison groups, which could have affected some of the statistical tests and suppressed the possibility of identifying differences in some demographic characteristics.

On the whole, the results obtained in this paper make a worthy input to the literature on the prevalence of postpartum depression in women in a government tertiary care hospital in Karachi. The findings support the significance of psychosocial factors, social support and past psychiatric illness, in the determination of maternal mental health during the postpartum period. Timely screening of high-risk women and

incorporating regular mental health screening in the postnatal care can enhance maternal well-being, enhance the mother-infant bond and decrease the future impact of untreated postpartum depression in the context of Pakistan.

5. Strengths and Limitations

There are a number of strengths associated with this study. It offers first, up-to-date evidence on postpartum depression in women in one of the largest public tertiary care hospitals in Karachi, thus providing locally relevant data on the small body of research on maternal mental health in Pakistan. The representation of women with various socioeconomic and educational statuses augmented the representativeness of the study population based in the hospital. Additionally, the Edinburgh Postnatal Depression Scale (EPDS) was used to evaluate the postpartum depressive symptoms and is a well validated and internationally recognized screening tool used extensively in the literature on maternal mental health (Cox et al., 1987). In the study, both the psychosocial and demographic predictors of postpartum depression were assessed and multivariate logistic regression analysis was used to determine the independent predictors after considering the possible confounding effects.

Regardless of these strengths, there are a number of limitations that should be taken into consideration in the interpretation of the findings. The cross-sectional study design does not allow the development of causality between psychosocial factors and postpartum depression since the outcome and exposure were measured at the same time. Sequential non-probability sampling based on a single tertiary care hospital might restrict the generalizability of the results to the entire postpartum population in Pakistan, especially to those women under care in primary care facilities or in privately-operating hospitals. Also, postpartum depression was detected with a screening questionnaire and not with a structured clinical psychiatric interview; hence, the results would present the women who are at risk of postpartum depression instead of those who are diagnosed with the problem. Lastly, the study has not considered other potentially powerful psychosocial factors like intimate partner violence, personality traits, pregnancy intention, and long-term follow-up on childbirth, which was not within the scope of the current study and can be examined in future longitudinal studies.

6. Conclusion

The current study is an important topic in maternal mental health problems among women receiving care in Jinnah Postgraduate Medical Centre, Karachi. The current research found that the prevalence of postpartum depressive symptoms is high and that younger maternal age, poor perceived social support, and a history of psychiatric illness were independent variables that are correlated with the probability of postpartum

depression. These results reveal the multifactorial aspect of postpartum depression and the relevance of psychosocial determinants along with demographic features.

Mental health screening needs to be incorporated in the postnatal care in order to be able to detect women at high risk of postpartum depression at an early stage. Specific consideration should be paid to mothers who has a history of psychiatric disease and mothers who report a lack of social support because a timely psychological evaluation and adequate intervention may enhance the maternal well-being and infant outcomes. Enhancing the coordination of efforts amid obstetricians, psychiatrists, psychologists, and primary healthcare providers can further help to improve provision of comprehensive maternal mental healthcare in the context of public health facilities. It is suggested that there should be future multicenter prospective studies based on diagnostic psychiatric assessment to confirm these results and help come up with evidence-based maternal mental health policies in Pakistan.

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8. Appendices

8.1 Funding

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8.2 Conflict of Interest

The authors state that they do not have any competing interests.

8.3 Authors' Contributions

The principal investigator conceived and designed the study, collected the data, did the statistical analysis, interpreted the findings and drafted the manuscript. Authors of the manuscript took part in the critical review of the manuscript, endorsed the final copy and are willing to be held responsible to all the work.

8.4 Ethical Approval

This study was approved by the Institutional Review Board/ Ethics Committee of Jinnah Postgraduate Medical Centre, Karachi and Faculty of Medicine University of Karachi before the start of this study. Informed consent was informed and written by all the participants prior to enrolment. The ethical principles of the Declaration of Helsinki were performed in all of the study procedures, and the confidentiality and anonymity of the participants were upheld during the study.

8.5 Data Availability Statement

The data that were created and analyzed in the present-day study can be obtained through the respective author upon the sensible demand.