

## Research Article

# Association of Psychological Wellbeing with Healthy Pregnancy, Maternal and Neonatal Outcomes in Pakistani Females

Lubna Razzak,<sup>1</sup> Sana Tariq,<sup>2</sup> Najia Bhatti,<sup>3</sup> Nusrat Khatoon<sup>4</sup>

<sup>1,2</sup>Tabba Kidney Institute, Karachi; <sup>3</sup>Shaheed Mohtarma Benazir Bhutto Medical University, Larkana; <sup>4</sup>Fazaia Ruth PFAU Medical College, PAF Base Faisal, Karachi

### Abstract

**Background:** Maternal and neonatal health has always been a point of concern for policymakers in Pakistan, understanding all determinants resulting in adverse maternal or fetal outcomes is an essential point to eliminating risk factors and establishing better opportunities for survival for mothers and newborns. This study aims to evaluate the association of psychological wellbeing with pregnancy outcomes, and maternal and neonatal health in the Pakistani population.

**Objective:** To assess the psychological wellbeing in pregnant females and its association with pregnancy outcomes, maternal and neonatal health in Pakistani population.

**Methods:** This is a prospective, cohort study conducted at private antenatal care centers of Karachi from January 2022 till March 2023, the estimated sample size was 384. Kupposwami scale for socio-economic status, psychological assessment Wellbeing in pregnancy questionnaire and satisfaction With Life Scale (SWLS) were used to assess psychological wellbeing during pregnancy. Cross-tabulation and Paired sample t-test was used along with chi-square test, keeping the p-value  $\leq 0.05$  as significant.

**Results:** The mean results of the SWL score indicated minimal satisfaction with life with a  $12.9 \pm 8.1$  mean value. Pre-term labor was reported in 37 (9.6%) and maternal mortality was reported in 9 (2.3%). low birth weight ( $<1500$ ) was reported in 11 (2.8%) while small for gestational age was reported in 19 (4.9%), neonatal mortality was reported in 15(3.9%).

**Conclusion:** This study concludes that maternal mental health distress is independent risk factor for low birth weight, and preterm deliveries.

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**Corresponding Author** | Sana Tariq Rajput, Manager, Research & Development Department, Tabba Kidney Institute, Karachi  
**Email:** sanatariqrajput@gmail.com

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### Introduction

Maternal and neonatal mortality has been an issue of concern for developing countries for decades

to keep countries sustainable. The world health organization (WHO) reported an overall estimation of maternal mortality as 186 deaths per 100,000 live births while neonatal mortality was estimated as 42 per 1000 live births, accounting for 7% of all newborn deaths reported globally.<sup>1,2</sup> 32% increase in maternal mortality rate from 2017 to 2022 challenged policymakers in Pakistan, studies established that Pakistan needs to reassess its determinants of maternal and neonatal mortality to



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reduce this alarmingly increasing rate.<sup>3</sup> Maternal mortality may be considered from the perspective of the greater problem of women's health and the growth of the nation's healthcare system. Nearly five million women fall pregnant in Pakistan each year, and of them, 700 000 (15 percent of all pregnant women) are expected to encounter some obstetrical and medical difficulties.<sup>4</sup> Maternal causes (complications during pregnancy, delivery, and up to six weeks after birth) account for 20% of mortality in adult females, with pregnancy-related problems killing most women under the age of 20 and over the age of 40.<sup>5</sup> Conception not only changes the physiological aspects of women but alters nutritional, social, financial, and psychological aspects as well, making them more vulnerable to anxiety, perceived stress, and depression.<sup>6,7</sup> For the physical and mental health of women and their unborn children in the long run, mental wellness during pregnancy is crucial. It is necessary to do a screening for common mental problems, such as anxiety, depression, and stress.<sup>8</sup> When thinking about risk factors for comorbidity in the prenatal period, a number of research investigating the prevalence and risk factors of comorbid depression and anxiety in the postpartum period offer valuable insights. For instance, comorbid symptoms of anxiety and depression increased six-fold when three or more stressors were present: emotional (e.g., personal, family or friend with major illness or injury), relationship (e.g., conflict within family member, trouble with alcohol or illicit drugs, or law), traumatic (e.g., physical, emotional, sexual abuse), and/or financial. Additionally linked to or predictive of increased comorbid symptoms of anxiety and depression were maternal age, childcare stress, perceived support, and felt stress.<sup>9</sup> Low nutritional status may exacerbate prenatal depression and postpartum depression (also known as perinatal depression), as pregnancy is a time of heightened nutritional needs. Pregnant Pakistani women face a serious danger from food insecurity due to the country's low position on several metrics that point to an excessive risk of food insecurity (it ranks 11<sup>th</sup> out of 148 nations globally) and high rates of hunger. In addition, women who experienced food insecurity or who were diagnosed with anxiety disorders were more likely to experience sadness. Research from throughout the world has shown a connection between prenatal depression and nutritional status, specifically with regard to individual nutrients.<sup>10-11</sup> One of the risk

factors for perinatal depression is a lack of social support. It has already been determined that social support is essential for mental health in all circumstances and settings. Comprehensive social support for improved mental health at all levels of care was advised by a recent meta-analysis of the relationship between social support and mental health, which revealed a strong, positive correlation between the two variables.<sup>12</sup> Pregnant women in Pakistan typically receive social assistance from close family members. However, a variety of misconceptions and incorrect ideas around mental disorders have been created as a result of a general lack of awareness about mental illnesses in the population.<sup>13,14</sup> Due to the traditional thought process of feudal society, maternal psychological health has been neglected by Pakistani families. This study aims to evaluate the psychological well-being of pregnant females attending antenatal clinics and its effect on healthy pregnancy, maternal and neonatal health.

## Methods

This is a prospective, cohort study. Conducted in private antenatal care clinics and maternity homes located in Federal B area, Karachi from January 2022 till March 2023. Study's objective was to assess the psychological issues during pregnancy and its association with healthy pregnancy, neonatal and maternal outcomes, therefore the clinics from specific area were enrolled in the study to recruit pregnant females from similar socio-economic status and vicinity to overcome SES differences. A total of 13 private clinics and 5 maternity homes located in designated areas were included in the study. A comprehensive and detailed informed consent form in the language of understanding was requested to sign by study participants before enrollment. For sample size calculation, the total females present in the country during 2022-2023 between the age of 15-50 years were used as population ( $n=67,647,727$ )\*, as the reproductive age of Asian females has been estimated between 15-49 years. Using Qualitrics, a survey system, and Rasoft sample size calculator, keeping a 95% confidence interval and 5% margin of error, the estimated sample size was 384.

A pregnant female attending antenatal clinics and maternity homes in a middle-income area of Karachi, Pakistan. Females in the first, second, or third trimester were included in the study, follow-up was done till delivery, and post-delivery complications were documented.

Maternal and neonatal details including any adverse event were associated with the psychological well-being of expecting mothers. Demographic and previous pregnancy details were documented including age, parity, history of miscarriages, history of abortions, stillbirth, small for gestational age in previous pregnancies, need for excessive hospitalization, and previous mortality of newborn were documented. Socio-economic status was measured with the help of the Kupposwami scale for socio-economic status<sup>15</sup>, results were categorized into five groups depending upon accumulated results, ranging from 29-26, 25-16, 15-11, 10-5, and < 5 representing Upper (I), Upper middle (II), Lower Middle (III), Upper lower (IV) and lower (V) respectively, while for psychological assessment Wellbeing in pregnancy questionnaire was used. WiP scale had 18 items scored on the Likert scale and evaluate basic six components of psychological well-being of pregnant females including autonomy, personal growth, environment, life purpose, positive relations with others, and self-esteem estimated with the help of the Likert scale indicating 01 as not agree at all and 05 as strongly agree. In a study by Shahidi et al.,<sup>16</sup> the internal consistency of this scale was calculated using Cronbach's alpha and was reported as 0.71 for the entire scale and 0.72, 0.73, 0.76, 0.52, 0.75, and 0.51 for the components of autonomy, personal growth, environmental mastery, purpose in life, and positive relationships with others, respectively. To assess the satisfaction with life, Satisfaction with Life Scale (SWLS)<sup>17</sup> was used to measure a respondent's overall level of contentment with their life on a seven-point scale ranging from "strongly agree" to "strongly disagree." Scores can vary from 5 to 35, with 20 serving as the neutral point on the scale. Scores between 31 and 35 show that the responder is exceedingly content with life, whereas scores 5 to 9 show that they are severely dissatisfied with it. Post-delivery details of mothers and newborns were documented to assess the hypothesis of the study. Demographic details such as age, parity, and number of miscarriages, and abortions were analyzed in mean  $\pm$  standard deviation. Frequency and percentages were calculated for socio-economic status scale categorizations, pregnancy outcomes, and post-delivery details. WiP and SWLS scales were analyzed according to their respective methods. The association between the two variables was analyzed with the help of cross-tabulation and Paired sample t-

test. Odds ratio test was used to assess the risk estimation between psychological issue and adverse pregnancy outcome. The significance of the mean difference was analyzed with the help of the chi-square test, keeping the p-value  $\leq 0.05$  as significant. Informed written consent in the language of understanding was obtained from all study participants. The confidentiality of SES, Domestic issues, pregnancy details, and other information was assured. All participants were given a specific individual case number to keep the anonymity of subjects.

## Results

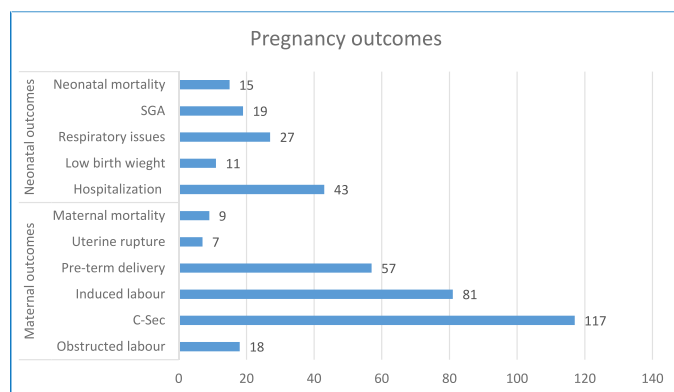
A total of 384 participants were enrolled in the study, all pregnant females attended antenatal care clinics. The mean age was estimated as  $27.4 \pm 9.6$  years with a range of 17-38 years. The mean parity was reported as  $3.2 \pm 2.1$  ranging from 0-6. Patients were sorted according to their trimester, with the frequency of 68 (17.7%), 144 (37.5%), and 172 (44.7%) in the first, second, and third trimesters respectively. 77 (20%) females had positive history of miscarriages in previous pregnancies, while 31(8%) reported abortions in previous pregnancies, 9 (2.3%) had stillbirths previously and 53 (13.8%) had documented history of small for gestational age in previous pregnancies. Antenatal mortality was reported in 15 (3.9%) mothers while under-five mortality was reported in 7(1.8%). K-SES results indicated 162 (42.1%) in the Lower middle (III) class, 83 (21.6%) in the Upper lower (IV) class, and 139 (36.1%) belonging to the lower (V) class. Well-being in pregnancy scale had 18 components, accumulated results in mean  $\pm$  standard deviation indicating autonomy, personal growth, environment, life purpose, positive relation with others, and self-esteem

**Table 1:** Wellbeing in Pregnancy scale and Satisfaction with life scale results.

WiP scale components	Mean	SD
Autonomy	2.4	1.2
Personal growth	1.9	0.8
Environment	2.8	1.1
Life purpose	2.4	0.9
Positive relationships with others	2.7	1.3
Self-esteem	2.1	0.8
SWL Components	Mean	SD
My life is close to my idol	22.8	7.4
My life is excellent	14.7	6.3
Satisfied with my life	12.9	8.1
Got important things I want in life	32.7	3.7
Won't change my life	31.2	4.2

as  $2.4 \pm 1.2$ ,  $1.9 \pm 0.8$ ,  $2.8 \pm 1.1$ ,  $2.4 \pm 0.9$ ,  $2.7 \pm 1.3$  and  $2.1 \pm 0.8$  respectively. The results elaborate a lower sense of personal growth and self-esteem in study participants. Satisfied with Life scale had five components describing satisfaction with life and results were categorized as 31-35, 26-30, 21-25, 20, 15-19, 10-14, and 5-9 as extremely satisfied, satisfied, slightly satisfied, Neutral, slightly dissatisfied, dissatisfied and extremely dissatisfied respectively. The mean results of the SWL score indicated minimal satisfaction with life with a  $12.9 \pm 8.1$  mean value. (Table 1)

Association of SES with WiP and SWLS indicated mostly distressed and dissatisfied pregnant females belongs to Lower middle (III) class and Upper lower (IV) class with 75 (19.5%) and 123 (23%) from WiP and 90 (23.4%) (and 47 (12.2%) from SWL scale while, females belong to lower (V) class were less stressed and had better satisfaction of life. Study outcomes were documented in two categories as maternal outcomes and neonatal outcomes, most frequently reported maternal outcome was emergency c-sec in 117 (30.4%), followed by induced labor in 81 (21%), and pre-term labor was reported in 57 (14.8%). Obstructed labor was reported in 18 (4.6%), Uterine rupture was reported in 7(1.8%) and maternal mortality was reported in 9 (2.3%). The most frequently documented neonatal outcome was excessive hospitalization after birth with 43 (11.1%), followed by respiratory issues with 27 (7%), low birth weight (<1500) was reported in 11 (2.8%) while small for gestational age was reported in 19 (4.9%), neonatal mortality was reported in 15(3.9%). (Figure 01)



**Figure 1:** Pregnancy outcomes (maternal and neonatal) categorization.

WiP and SWLS overall results categorized within satisfied, neutral, and dissatisfied groups indicating 91 (23.6%), 95(24.7%), and 198 (51.5%) respectively in WiP while

108(28.1%), 134(34.8%), and 142(36.9%) respectively in SWLS, with p-value of 0.01 and 0.07 for WiP and SWLS. Association of adverse maternal and neonatal outcomes with dissatisfied results of WiP and SWLS estimation indicated positive results of pre-term labor, hemorrhage, and emergency caesarian in maternal outcomes, while neonatal outcome association with WiP was positive in SGA, excessive hospitalization, and neonatal mortality. SWLS scale indicates a positive association with obstructed labor, pre-term labor, induced labor, hemorrhage, emergency caesarian, and maternal mortality while neonatal adverse effects were respiratory issues, excessive hospitalization, and neonatal mortality. (Table 2)

**Table 2:** Odds ratio analysis of study participant's WiP and SWL scale results and pregnancy outcomes.

Outcomes	WiP		SWLS		
	OR	CI 95%	OR	CI 95%	
Maternal Outcomes	Obstructed labor	0.7	0.04-1.4	1.3	0.7-2.6
	Pre-term labour	1.3	0.07-2.4	1.8	1.2-3.4
	Induced labor	0.9	0.3-1.8	1.2	0.5-2.4
	Uterine rupture	0.01	0.006-0.8	0.7	0.1-1.4
	Hemorrhage	1.7	0.6-2.4	1.3	0.9-2.6
	Emergency Cesarean	2.1	1.8-4.1	1.9	1.1-2.8
	Maternal mortality	0.9	0.04-1.8	1.1	0.7-2.2
Neonatal outcomes	SGA	1.2	0.9-2.4	1.9	1.3-2.1
	LBW < 1500 gm	0.04	0.007-0.8	0.9	0.5-1.8
	Respiratory issues	0.8	0.2-1.1	1.3	0.9-2.6
	Excessive hospitalization	1.1	0.7-2.2	2.4	1.8-4.2
	Neonatal mortality	1.6	0.6-2.1	1.9	1.2-2.8

## Discussion

Our study aimed to provide an overview of psychological issues during pregnancy and their impact on healthy pregnancy in Pakistani females, results of this study indicated that decreased psychological well-being in pregnancy and satisfaction with life leads to maternal and neonatal adverse outcomes including pre-term labor, hemorrhage, emergency caesarian, SGA, excessive hospitalization and maternal and neonatal mortality.<sup>18</sup> Specific mother and newborn care after birth is essential, especially within the first 30 days after birth, as the mortality rate is comparatively higher.<sup>19</sup> Psychological distress was identified in 198 (51.5%) pregnant females indicating they had experienced stress and anxiety due to relationships with others, environment, and self-esteem while satisfaction with life was not good in respectively in 142 (36.9%) pregnant females. Aneja J et.al.,<sup>20</sup> reported



30.9% stress prevalence during pregnancy in India, while KJ Gold,<sup>21</sup> indicated maternal depression as an independent determinant of low birth weight and premature delivery. While N Schneid-Kofman<sup>22</sup> reported a higher prevalence of perinatal mortality rate, congenital disorders, malformations, low APGAR score, and low birth weight, the OR results reported in the study indicated 2.4 (1.5-3.7) and 1.4 (1.01-1.9) for perinatal mortality and congenital disorders respectively. The results supported our study data of maternal and neonatal mortality rate, low birth weight, and SGA. Similarly, N Tanya Nagahawatte,<sup>23</sup> reported that pregnant females with stress, anxiety, and depressive illness are at higher risk of preterm delivery without any discrimination of Sociodemographic differences. Data from developing countries such as Pakistan<sup>1,7,10</sup> Bangladesh,<sup>24</sup> and India,<sup>20</sup> indicated higher rates of preterm deliveries, low birth weight, SGA, and neonatal mortality as compared to developed countries<sup>25</sup>, the reason behind these higher prevalence rates are predictable and avoidable, including nutritional issues, Infectious diseases, Short pregnancy interval, gender-based violence, intimate partner violence, use of tobacco and other addictive substances, poor access to healthcare providers, social norms, poverty, and ethical disparities.<sup>26,27</sup> Evidence from South Asia has demonstrated that postnatal depression in mothers, a frequent and possibly curable mental health condition, is one of the reasons why newborns do not flourish.<sup>28</sup> Risk factors for postnatal depression in this area and the developing world include low income, the birth of a daughter when a son was desired, issues with the mother-in-law and parents, a lack of physical assistance, and unfavorable life events during pregnancy. According to studies on stress in pregnant women, 40% of them describe their lives as being just moderately difficult, while one in ten pregnant women report experiencing severe levels of stress. High-stress levels are more common in women who are under 20 years old, single, from low socioeconomic backgrounds, have educations below grade 11, and lack social support.<sup>29,30</sup>

Our study showed that pregnant females from the lower middle class of SES have reported several factors of stressful events and dissatisfaction with life, stress, depression, and generalized declined psychological well-being are independent risk factors for low birth weight, small for gestational age, respiratory infections and mortality in newborn, while maternal mortality,

preterm delivery, emergency caesarian and prolonged labor are aspects for pregnant females to be concerned about. However, uterine rupture had no association with the psychological well-being of pregnant females. Follow up protocol, recall bias and hesitancy to share are limitation of this study. The strengths of this study is identification of determinants of psychological issues and triggers for pregnant females, However, fear of being exposed in front of family members and close connection with area gynecologist's patients might feel reluctant in describing their distress.

A proper association of antenatal institutes with psychologist and psychiatrist will help ensuring psychological distress on early stages of pregnancy, adding psychologists in community mobilizing team will be helpful for population of reproductive age to identify and manage psychological issues.

### Conclusion

This study concludes that maternal mental health distress not only adversely impacts the mother's health but also neonatal well-being, low birth weight, and preterm deliveries are indecent risk factors in mothers with declined satisfaction with life and higher psychological issues during pregnancy. In Pakistan, maternal and neonatal health is a major concern, and policies to establish better nutritional and medical care are essential for pregnant females, however, psychological well-being is been neglected and needs proper recognition to get counseling, and treatments and achieve a healthy pregnancy. Association of psychologists and psychiatrist in antenatal clinics are necessary to identify issues early and adding the mental health assessment and counseling's members in community mobilizer's team will ensure early identification and management of psychological issues in reproductive aged population.

**Ethical Approval:** The Institutional Ethical Review Board (IERB) SZABIST, Karachi Campus approved this study vide Ref. No. IERB(18)/SZABIST-KHI (PH)/19104134/200125.

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**Authors' Contribution**

**LR:** Conception and design, acquisition of data, drafting the article

**ST:** Acquisition of data, analysis and interpretation, drafting the article, revising it critically for important intellectual content

**NB:** Acquisition of data, analysis and interpretation,

**NK:** Analysis and interpretation, drafting the article

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