

## ORIGINAL ARTICLE

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

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## ABSTRACT

**Background:** Psychological issues have a significant effect on pregnant women's health before, during, and after childbirth and can cause a number of issues.

**Aim:** The aim of this study was to explore the association of psychological wellbeing with healthy pregnancy, maternal and neonatal outcomes

**Material and method:** The present prospective study was carried out at the department of Psychiatry and Department of Obstetrics and Gynecology, Bacha Khan Medical College Mardan Medical Complex Mardan from July 2022 to December 2022 after taking permission the ethical committee of the hospital. Pregnant women of 1<sup>st</sup> 2<sup>nd</sup> and 3<sup>rd</sup> trimester of different age groups (ranged 17-38 years) who visited the gynecology and antenatal department were included in this study. Rasoft calculator was used to determine the sample size and was determined to be 300. The Kupposwami scale was used to measure socioeconomic status. The participant's average level of satisfaction with their life was measured using the Satisfaction with Life Scale. The WIP and SWLS scales were examined using the appropriate techniques. Cross-tabulation and the paired sample t test were used to examine the relationship between the two variables. The risk assessment between psychiatric problems and adverse pregnancy results was done using the odds ratio test. Using the chi-square test, the significance of the mean difference was examined, with the p-value of less than 0.05 being considered significant.

**Results:** A total of 300 pregnant women were examined in this study. The mean age of the study population was  $28.5 \pm 7.5$  (ranged 17-38) years. According to their trimester, participants were classified. The average SWL score was  $11.10 \pm 8.1$ , indicating a low level of life satisfaction. The most often reported maternal outcome was emergency cesarean section 33.0%, followed by induced labor 22%, and preterm labor 15%. Neonatal outcomes revealed that after birth Excessive hospitalization observed in 33 (1%) cases, respiratory problems was noted in 18 (6%) cases, low birth weight was seen in 2.3%. Maternal outcomes were positively correlated with pre-term labor, hemorrhage, and emergency caesarian sections, while neonatal outcomes were positively correlated with SGA, excessive hospitalization, and neonatal mortality.

**Conclusion:** The present study concluded that maternal mental health distress has negative effect on both the health of the mother and neonate.

**Keywords:** Association; Psychological Wellbeing; Pregnancy; Maternal; Neonatal.

## INTRODUCTION

Pregnancy-related health concerns have gained considerable attention among researchers worldwide. Although the impact of psychological well-being on prenatal women in relation to conditions such as diabetes mellitus, maternal weight, and complications during childbirth has been widely studied, findings remain inconsistent. Anxiety and depression have been associated with increased cortisol secretion and insulin resistance, thereby elevating the risk of gestational diabetes mellitus in pregnant women.<sup>1</sup> Excessive gestational weight gain may disrupt the hypothalamic-pituitary-adrenal (HPA) axis, and previous studies have shown that stress during pregnancy can adversely affect fetal outcomes.<sup>2</sup> Elevated stress levels increase cortisol production, encourage the intake of calorie-dense "comfort" foods, and contribute to central fat accumulation. However, despite these biological mechanisms, earlier research has not consistently demonstrated a clear association between psychosocial stress during pregnancy and either excessive or inadequate gestational weight gain.<sup>3</sup>

Evidence suggests that exposure to psychological distress during pregnancy can exert both direct and indirect effects on maternal health, as well as on the child's long-term development, functional capacity, and overall health and well-being.<sup>4</sup> Indirect effects of prenatal stress may contribute to an increased risk of adverse birth outcomes by influencing fetal growth and development.<sup>5</sup> For instance, stress can increase the likelihood of prenatal depression, which may compromise the quality of postnatal care by limiting maternal-infant interaction during the early postpartum period.<sup>4</sup> Direct effects of prenatal stress include alterations in the neurobiological development of the infant.<sup>6</sup> Psychological stress during pregnancy has also been linked to

several adverse pregnancy outcomes, including low birth weight, neonatal morbidity, and spontaneous preterm birth.<sup>7</sup>

Maintaining good mental well-being during pregnancy is essential for the long-term physical and psychological health of both mothers and their unborn children. Routine screening for common mental health conditions such as stress, anxiety, and depression is therefore essential.<sup>8</sup> Numerous studies assessing the prevalence and risk factors of comorbid depression and anxiety during the postpartum period provide valuable insight into potential risk factors during pregnancy. For example, exposure to three or more stressors such as financial difficulties, traumatic experiences, or emotional relationship problems—has been shown to increase the likelihood of comorbid depression and anxiety symptoms by up to six times. Maternal age, childcare-related stress, perceived social support, and perceived stress levels have also been identified as significant predictors of increased comorbid depressive and anxiety symptoms.<sup>9</sup>

The present study was therefore conducted to determine the association between psychological well-being and healthy pregnancy outcomes, including maternal and neonatal outcomes.

## MATERIAL AND METHOD

The present prospective study was carried out at the department of Psychiatry and Department of Obstetrics and Gynecology, Bacha Khan Medical College Mardan Medical Complex Mardan from July 2022 to December 2022 after taking permission the ethical committee of the hospital. Pregnant women of 1<sup>st</sup> 2<sup>nd</sup> and 3<sup>rd</sup> trimester of different age groups (ranged 17-38 years) who visited the gynecology and antenatal department were included in this study. Individuals with history of any chronic disease like mental disorder, diabetes mellitus, cardiac disorder and hypertension

before their pregnancy were excluded from the study. Rasoft calculator was used to determine the sample size and was determined to be 300. Each participant was followed up till delivery and complication after delivery were recorded. The psychological well-being of pregnant women was related to maternal and neonatal details, including any negative situation. Age, parity, history of miscarriages, history of abortions, stillbirth, small for gestational age in previous pregnancies, need for excessive hospitalization, and previous newborn mortality were among the demographic and before pregnancy details that were recorded. The Kupposwami scale was used to measure socioeconomic status. The results were divided into five groups based on total scores: 29-26, 25-16, 15-11, 10-5, and < 5, which correspond to Upper (I), Upper Middle (II), Lower Middle (III), Upper Lower (IV), and Lower (V), respectively. The Wellbeing in Pregnancy questionnaire was used for the psychological evaluation. The 18 items on the WiP scale were scored on a Likert scale to assess the fundamental six elements of pregnant women's psychological well-being: autonomy, personal development, environment, life purpose, positive relationships with others, and self-esteem. The Likert scale was used to estimate these elements, with 01 denoting "not agree at all" and 05 denoting "strongly agree." A participant's average level of satisfaction with their life was measured using the Satisfaction with Life Scale (SWLS), which has seven points that range from "strongly agree" to "strongly disagree." The neutral point on the scale is 20, and scores range from 5 to 35. Respondents who score between thirty-one and thirty-five indicate that they are extremely pleased with life, whereas those who score between 5 and 9 indicate that they are extremely unsatisfied. Mothers' and babies' post-delivery information was recorded in order to evaluate the study's premise. Age, parity, the number of miscarriages and abortions, and other demographic information were examined using mean  $\pm$  standard deviation. For pregnancy outcomes, postpartum information, and socioeconomic status scale categories, frequency and percentages were computed. The WiP and SWLS scales were examined using the appropriate techniques. Cross-tabulation and the paired sample t test were used to examine the relationship between the two variables. The risk assessment between psychiatric problems and adverse pregnancy results was done using the odds ratio test. Using the chi-square test, the significance of the mean difference was examined, with the p-value of less than 0.05 being considered significant. Pregnancy details, personal issues, SES, and other information were guaranteed to be kept private. To maintain the individuals' identity, each participant was assigned a unique case number.

## RESULTS

A total of 300 pregnant women were examined in this study. The mean age of the study population was  $28.5 \pm 7.5$  (ranged 17-38) years. According to their trimester, participants were classified. Most of the individuals were in the 3<sup>rd</sup> trimester 140 (46.6%), followed by 2<sup>nd</sup> 120 (40%) and 1st 40 (13.3%) respectively. The mean parity was described as  $4.0 \pm 1.2$  ranging from 0-5. Out of all the participants in the previous pregnancies 65 (21.6%) had a positive history of miscarriages, 25 (8.3%) reported abortions, 6 (2%) had stillbirths, and 40 (13.3%) had a history of small for gestational age in previous pregnancies. Ten (3.3%) women had antenatal mortality, and five (1.6%) had under-five mortality. K-SES results were as follows: 130 (43.3%) in the Lower Middle (III) class, 68 (22.6%) in the Upper Lower (IV) class, and 110 (36.6%) in the Lower (V) class. The 18-item well-being in pregnancy scale yielded mean  $\pm$  standard deviation scores for autonomy, personal development, environment, life purpose, positive relationships with others, as well as self-esteem of  $3.1 \pm 1.4$ ,  $1.8 \pm 2.4$ ,  $1.6 \pm 2.7$ ,  $1.2 \pm 2.6$ ,  $1.4 \pm 1.3$ , and  $2.2 \pm 0.5$ , respectively. The findings indicate that research participants had a weaker feeling of personal development and esteem. The results were classified as 31-35, 26-30, 21-25, 20, 15-19, 10-14, and 5-9 as extremely satisfied, satisfied, slightly satisfied, neutral, dissatisfied, and extremely dissatisfied, respectively, according to the five components of the Satisfied with Life scale. The average

SWL score was  $11.10 \pm 8.1$ , indicating a low level of life satisfaction as presented in table 1. The association between SES and WiP and SWLS revealed that the majority of pregnant women in the Lower Middle (III) and Upper Lower (IV) classes were distressed and dissatisfied, with sixty (20%) and 75 (25%) from WiP and 73 (24.3%) and 37 (12.3%) from the SWL scale, respectively. In contrast, women in the lower (V) class were less stressed and had higher life satisfaction. The study's results were divided into two categories: maternal outcomes and neonatal outcomes.

Table 1. Pregnancy well-being scale and life satisfaction scale outcomes.

WiP scale components	Mean	SD
Personal growth	1.8	0.5
Self-esteem	2.2	0.7
Positive relationships with others	2.6	1.4
Life purpose	2.7	1.2
Environment	2.6	1.4
Autonomy	3.1	1.4
SWL Components	Mean	SD
My idol is near to my life.	21.9	7.5
I have a great life.	13.8	7.2
I'm happy satisfied my life	14	7.9
I've achieved my goals in life.	34.6	4.7
Won't make my life better	31.2	5.0

Table 2. neonatal and maternal outcomes among the study participants

Maternal outcomes	Frequency /percentage
Cesarean section in	99 (33.0)
Induced labor	66(22)
Preterm labor	45(15)
Maternal death	7(2.3)
Uterine rupture	4(1.3)
Obstructed labor	12(4)
Neonatal outcomes	
Neonatal mortality	11(3.6%)
Low gestational weight	12(4.0)
Respiratory problems	18(6)
Hospitalization after birth	33(11.0)

Table 3. Odds ratio assessment of study individuals' outcomes during pregnancy and WiP and SWL scale results

Neonatal outcomes				
Outcomes	WiP		SWL	
	OR	CL 95%	OR	CL 95%
mortality	1.5	0.6-2.1	1.9	1.2-2.8
Hospitalization	1.1	0.7-2.2	2.4	1.8-4.2
Respiratory disorders	0.8	0.2-1.1	1.3	0.9-2.6
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
Maternal outcomes				
Mortality	0.8	0.04-1.8	1.1	0.8-2.2
Cesarean	2.3	1.9-1.5	1.9	1.1-2.8
Obstructed labor	0.8	0.04-1.5	1.3	0.6-2.7
Pre-term labour	1.4	0.07-2.5	1.8	1.2-3.4
Hemorrhage	1.7	0.5-0.4	1.4	0.1-1.4
Uterine rupture	0.02	0.007-0.8	0.8	0.2-1.5

The most often reported maternal outcome was emergency cesarean section in 99 cases (33.0%), followed by induced labor in 66 cases (22%), and preterm labor in 45 cases (15%). Maternal death was recorded in 7 (2.3%), uterine rupture in 4 (1.3%), and obstructed labor in 12 (4%). neonatal outcomes revealed that after birth Excessive hospitalization observed in 33 (11%) cases, respiratory problems was noted in 18 (6%) cases, low birth weight (<1500) was seen in 7 (2.3%), small gestational age was reported in 12 (4.0%) individuals and neonatal mortality in 11 (3.6%) as presented in table 2. Overall results for WiP and SWLS were classified into satisfactory, neutral, and dissatisfied groups, with p-values of 0.01 and 0.07 for WiP and SWLS, respectively, and 74 (24.6%), 80 (26.6%), and 160 (53.3%) in WiP and 90 (30%), 134 (34.8%), and 115 (38.3%) in SWLS. Adverse maternal and neonatal outcomes were positively correlated with unsatisfactory WiP and

SWLS estimation results. Maternal outcomes were positively correlated with pre-term labor, hemorrhage, and emergency caesarian sections, while neonatal outcomes were positively correlated with SGA, excessive hospitalization, and neonatal mortality. Obstructed labor, preterm labor, induced labor, hemorrhage, emergency caesarian section, and maternal death are all positively correlated with the SWLS scale, but respiratory problems, excessive hospitalization, and newborn mortality were the adverse effects as presented in table 3.

## DISCUSSION

For many years, developing countries have been concerned about maternal and neonatal mortality in their efforts to sustain population health. According to the World Health Organization, neonatal mortality is estimated at 42 per 1,000 live births, accounting for approximately 7% of total infant deaths globally, while maternal mortality is estimated at 184 deaths per 100,000 live births worldwide.<sup>10,11</sup> Policymakers in Pakistan were alarmed by a reported 32% increase in the national maternal mortality rate between 2017 and 2022. Research suggests that Pakistan must reassess the contributing factors to maternal and neonatal mortality in order to reduce this rapidly increasing burden.<sup>12</sup> The broader issue of women's overall well-being and the expansion of the national healthcare system must also be considered when addressing maternal mortality.

Approximately five million women in Pakistan become pregnant each year, and nearly 70,000 of them—about 15% of all pregnant women—are expected to develop obstetric or medical complications.<sup>13</sup> Pregnancy-related complications account for a large proportion of deaths among women younger than 20 years and older than 40 years. Maternal causes, including complications during pregnancy, childbirth, and the first six weeks postpartum, contribute to approximately 20% of adult female mortality.<sup>14</sup> Mental well-being during pregnancy is crucial for the long-term physical and psychological health of both mothers and their unborn children. Common mental health concerns such as anxiety, depression, and stress require appropriate evaluation and management.

The present study was therefore conducted to explore the association between psychological well-being and healthy pregnancy outcomes, including maternal and neonatal outcomes. A total of 300 pregnant women were enrolled. The mean age of the study population was  $28.5 \pm 7.5$  years (range: 17–38 years). Participants were categorized according to gestational trimester; the majority were in the third trimester (46.6%), followed by the second trimester (40%) and the first trimester (13.3%). A similar demographic pattern was reported in a study by Razzak et al., supporting the findings of the present research.<sup>15</sup>

Our findings indicated that poor mental health and low life satisfaction during pregnancy were significantly associated with adverse maternal and neonatal outcomes, including preterm labor, antepartum hemorrhage, emergency cesarean section, prolonged hospital stay, and increased maternal and neonatal mortality. These results are consistent with findings from previous studies.<sup>16</sup> Given the relatively high mortality rates, intensive follow-up care for mothers and newborns is essential, particularly during the first 30 days following delivery.<sup>17</sup>

In the present study, a large proportion of pregnant women from lower-middle and upper-lower socioeconomic classes reported psychological distress and dissatisfaction, suggesting exposure to stress and anxiety related to interpersonal relationships, environmental factors, and internal coping mechanisms. Most participants also reported low levels of life satisfaction. These findings are comparable to those reported by Aneja et al.<sup>18</sup> The most common maternal outcome observed was emergency cesarean section (33.0%), followed by induced labor (22%) and preterm labor (15%). Maternal mortality was recorded in 2.3% of cases, uterine rupture in 1.3%, and obstructed labor in 4%.

Neonatal outcomes showed prolonged hospitalization in 33 (11%) cases, respiratory complications in 18 (6%), low birth weight (<1500 g) in 7 (2.3%), small-for-gestational-age infants in 12 (4.0%),

and neonatal mortality in 11 (3.6%) cases. Similar outcomes have been reported in previous studies, supporting our findings.<sup>15</sup> Likewise, Nagahawatte reported that women experiencing stress, anxiety, or depression during pregnancy were more likely to deliver preterm, irrespective of sociodemographic differences.<sup>19</sup> Compared to developed countries,<sup>20</sup> data from developing nations such as Pakistan indicate higher rates of preterm birth, low birth weight, small-for-gestational-age infants, and neonatal mortality.<sup>9</sup> These adverse outcomes are largely attributable to preventable factors including poor nutrition, infectious diseases, short interpregnancy intervals, gender-based and intimate partner violence, substance use, limited access to healthcare services, sociocultural barriers, poverty, and health inequities.<sup>16</sup>

Studies on stress among pregnant women indicate that approximately 40% experience moderate stress, while nearly 10% report high stress levels. Younger women (<20 years), unmarried women, those from lower socioeconomic backgrounds, individuals with less than secondary education, and those lacking social support are at greater risk of severe stress.<sup>21</sup> Our study similarly revealed that pregnant women from lower-middle socioeconomic groups reported multiple stressful life events and reduced life satisfaction. Stress, depression, and overall poor psychological well-being were independently associated with adverse neonatal outcomes such as low birth weight for gestational age, respiratory infections, and neonatal mortality, as well as maternal complications including preterm delivery, emergency cesarean section, and prolonged labor. However, no significant association was observed between uterine rupture and maternal psychological health.

The limitations of this study include potential recall bias, challenges related to follow-up, and participants' reluctance to disclose psychological distress. A major strength of the study lies in the identification of psychological issues and stressors among pregnant women. However, women receiving care from local gynecologists may hesitate to report emotional distress due to concerns about family presence or social stigma. To mitigate psychological distress during early pregnancy, antenatal care facilities should collaborate closely with psychologists and psychiatrists. Integrating mental health professionals into community outreach programs may further enhance awareness, early identification, and management of psychological disorders among women of reproductive age.

## CONCLUSION

The present study concluded that maternal mental health distress has negative effect on both the health of the mother and neonate. Decreased life satisfaction and increased psychological problems during pregnancy are associated with low birth weight and premature births.

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