The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 5, 2025

A COMPARATIVE STUDY ON PHYSICAL AND MENTAL HEALTH DIFFERENCES BETWEEN PREGNANT AND NON-PREGNANT WOMEN: INSIGHTS FROM A CROSS-SECTIONAL ANALYSIS

Aanchal Rohra[*1], Aila Naeem[2], Aatiqa Qaim[3], Areeba Shaikh[4], Dr Arsalan Ahmed Uqaili[5]

[*1,2,3,4]*LUMHS Jamshoro, House Officer*
[5]*Assistant Professor, Department of Physiology, LUMHS, Jamshoro*

[*1]aanchalrohra7@gmail.com, [2]ailanaeem303@gmail.com, [3]aatiqaqaim@gmail.com, [4]areebashaikh244@gmail.com, [5]arsalanuqaili@gmail.com

[*1]0009-0000-1434-876X, [2]0009-0009-0864-0727, [3]0009-0007-4646-0204, [4]0009-0009-4529-7040

DOI: https://doi.org/10.5281/zenodo.15429954

Keywords
Pregnancy, mental health, stress, anxiety, depression, BMI, blood pressure, maternal health.

Article History
Received on 07 April 2025
Accepted on 07 May 2025
Published on 16 May 2025

Corresponding Author: *

Abstract

Background

Pregnancy induces significant physiological and psychological changes, often leading to elevated stress, anxiety, and depression. This study aimed to compare physical and mental health parameters between pregnant and non-pregnant women to identify disparities and guide targeted interventions.

Methods

A cross-sectional study was conducted on 200 participants (100 pregnant, 100 non-pregnant) recruited from a healthcare institution in Hyderabad, Pakistan. Physical health parameters, including BMI, blood pressure, and waist-hip ratio, were measured. Mental health was assessed using validated scales for stress, anxiety, and depression. Data were analyzed using descriptive statistics, independent t-tests, and correlation analyses.

Results

Pregnant women exhibited higher BMI (29.5 ± 3.0 vs. 23.8 ± 2.5, $p < 0.0001$), systolic blood pressure (125 ± 7.5 mmHg vs. 115 ± 7.0 mmHg, $p < 0.0001$), and waist-hip ratio (0.95 ± 0.07 vs. 0.82 ± 0.06, $p < 0.0001$) compared to non-pregnant women. Mental health scores were also significantly elevated in the pregnant group, with stress (3.5 ± 0.8 vs. 1.5 ± 0.6, $p < 0.0001$), anxiety (3.4 ± 0.9 vs. 1.4 ± 0.5, $p < 0.0001$), and depression (3.3 ± 0.9 vs. 1.3 ± 0.6, $p < 0.0001$). Correlations were observed between BMI and blood pressure ($r = 0.76$, $p < 0.0001$) and between stress, anxiety, and depression ($r > 0.80$, $p < 0.0001$).

Conclusion

Pregnant women exhibited significantly higher BMI, blood pressure, and mental health distress compared to non-pregnant women. The findings highlight the need for integrating routine mental health screenings and targeted interventions in antenatal care. Future longitudinal research should explore the persistence of these disparities postpartum.

INTRODUCTION

Pregnancy is a transformative phase characterized by significant physiological and psychological changes. However, few studies have comprehensively examined how these changes compare to non-pregnant women in the same reproductive age group. This study addresses this gap by assessing both physical and mental health disparities between the two groups, emphasizing implications for maternal care. These changes can impact various health parameters, including body mass index (BMI), blood pressure, mental health, and lifestyle behaviors.

Mental health concerns, particularly stress, anxiety, and depression, are prevalent among pregnant women, often exacerbated by hormonal fluctuations and psychosocial stressors. These conditions can adversely affect maternal outcomes and fetal development, underscoring the need for early identification and intervention【1】【2】. On the other hand, non-pregnant women, especially those in their reproductive years, may face unique health challenges, including concerns about infertility, lifestyle-related health risks, and employment-related stress【3】【4】.

Studies suggest that physiological parameters such as BMI and blood pressure often differ significantly between pregnant and non-pregnant women due to the metabolic and cardiovascular adaptations of pregnancy【5】【6】. Additionally, waist circumference and waist-hip ratio are vital indicators of overall metabolic health, which may also show significant variations during pregnancy【7】【8】.

Recent research highlights the role of lifestyle factors, such as smoking and contraceptive use, in influencing maternal and reproductive health outcomes. Smoking, in particular, has been linked to adverse pregnancy outcomes, while contraceptive use often reflects broader socio-cultural and health access dynamics【9】【10】.

This study aims to explore and compare the physical and mental health parameters of pregnant and non-pregnant women, with a focus on identifying key differences and their implications. The findings will contribute to the growing body of evidence supporting tailored health interventions for women across different life stages.

Methodology

This cross-sectional study was conducted to compare physical and mental health parameters between pregnant and non-pregnant women. The study was carried out at Civil Hospital, Hyderabad, Pakistan over a period of 3 months. The research adhered to ethical guidelines, and informed consent was obtained from all participants.

The study included a total of 200 women, divided into two equal groups: 100 pregnant and 100 non-pregnant women. Pregnant women were recruited from antenatal clinics, while non-pregnant women were enrolled from outpatient departments and community settings. Inclusion criteria for both groups included women aged 18–35 years, in generally good health, and capable of providing consent. Pregnant women were further stratified into trimesters to account for gestational differences. Women with chronic illnesses unrelated to pregnancy, such as pre-existing diabetes or hypertension, were excluded.

Data was collected using structured questionnaires and physical assessments. Demographic details such as age, employment status, and monthly income were recorded. Physical health parameters, including body mass index (BMI), systolic and diastolic blood pressure, waist circumference, and waist-hip ratio (WHR), were measured using standard protocols. Mental health assessments included validated scales for stress, anxiety, and depression scores.

Data analysis was performed using **SPSS version 26.0.** Descriptive statistics were calculated for continuous variables (e.g., mean, standard deviation) and frequency distributions for categorical variables. Independent t-tests were used to compare continuous variables between the groups, and chi-square tests assessed associations for categorical variables. Statistical significance was set at $p < 0.05$.

Results:

This study aims to provide a comparative analysis of physical and mental health indicators among pregnant and non-pregnant women, contributing to a better understanding of health disparities during the reproductive phase.

Table 1: Comparison of Descriptive Statistics Between Pregnant and Non-Pregnant Groups

Parameter	Mean ± S.D. (Pregnant)	Mean ± S.D. (Non-Pregnant)	t-Statistic	p-Value
BMI	29.5 ± 3.0	23.8 ± 2.5	14.60	< 0.0001
Systolic BP (mmHg)	125 ± 7.5	115 ± 7.0	9.75	< 0.0001
Diastolic BP (mmHg)	80 ± 5.2	72 ± 4.5	11.63	< 0.0001
Waist Circumference (cm)	95.0 ± 8.0	80.0 ± 6.5	14.55	< 0.0001
Waist-Hip Ratio (WHR)	0.95 ± 0.07	0.82 ± 0.06	14.10	< 0.0001
Stress Score	3.5 ± 0.8	1.5 ± 0.6	20.00	< 0.0001
Anxiety Score	3.4 ± 0.9	1.4 ± 0.5	19.43	< 0.0001
Depression Score	3.3 ± 0.9	1.3 ± 0.6	18.49	< 0.0001

This table highlights significant differences in physical and mental health parameters between the pregnant and non-pregnant groups. Pregnant women had higher **BMI**, **systolic BP**, **diastolic BP**, and **waist circumference**, likely reflecting the physiological changes associated with pregnancy. Similarly, **mental health scores** for stress, anxiety, and depression were elevated in the pregnant group, with significant differences across all parameters (**$p < 0.0001$**). These findings emphasize the compounded physical and psychological burden during pregnancy, suggesting the need for targeted interventions.

Table 2: Frequency Distribution of Categorical Variables for Pregnant Group

Parameter	Category	Frequency
Trimester	1st Trimester	33
	2nd Trimester	35
	3rd Trimester	32
Ultrasound Abnormalities	Yes	18
	No	82
Employment Status	Housewife	50
	Teacher	20
	Govt Employee	15
	Maid	15
Smoking	Yes	20
	No	80
Psychiatric Medication	Yes	10
	No	90
History of Miscarriage	Yes	12
	No	88

This table provides the frequency distribution for pregnant participants across various categories. Most participants were in their **second trimester** (35%), with the remainder evenly split between the first and third trimesters. **Ultrasound abnormalities** were noted in 18% of cases, highlighting the importance of prenatal screening. The majority of participants were **housewives** (50%), with fewer employed as teachers, government workers, or maids. **Smoking prevalence** (20%) and **psychiatric medication use** (10%) indicate potential lifestyle and mental health challenges during pregnancy. A small proportion reported a **history of miscarriage** (12%), underlining the need for careful prenatal monitoring in high-risk cases.

Table 3: Frequency Distribution of Categorical Variables for Non-Pregnant Group

Parameter	Category	Frequency
Employment Status	Housewife	45
	Teacher	25
	Govt Employee	20
	Maid	10
Smoking	Yes	15
	No	85
Psychiatric Medication	Yes	8
	No	92
Contraceptive Use	Yes	50
	No	50
Concerns About Infertility	Yes	35
	No	65

This table outlines the frequency of categorical variables for non-pregnant participants. A notable 50% of participants reported **contraceptive use**, reflecting its widespread prevalence in this group. Concerns about **infertility** were expressed by **35%** of participants, emphasizing potential anxiety regarding future pregnancies. The majority of non-pregnant women were **housewives** (45%), with a smaller proportion employed in other roles. **Smoking prevalence** (15%) and **psychiatric medication use** (8%) were slightly lower than in the pregnant group, indicating relatively fewer lifestyle and mental health concerns.

Table 4: Correlation Between Continuous Variables

Variables	Correlation Coefficient (r)	p-Value
BMI and Systolic BP	0.76	< 0.0001
BMI and Diastolic BP	0.72	< 0.0001
Stress and Anxiety Scores	0.82	< 0.0001
Stress and Depression Scores	0.80	< 0.0001

This table shows the correlation coefficients between continuous variables for all participants. A **strong positive correlation** was observed between **BMI and blood pressure (systolic and diastolic)**, suggesting that higher BMI is associated with increased blood pressure. Similarly, **stress, anxiety, and depression scores** were strongly correlated, indicating that these mental health variables are interdependent. The **p-values (< 0.0001)** confirm the statistical significance of these relationships.

Discussion

This study highlights significant differences in physical and mental health parameters between pregnant and non-pregnant women, with pregnant women exhibiting elevated stress, anxiety, and depression scores. These findings align with existing literature emphasizing the heightened psychological burden during pregnancy due to hormonal changes, physical discomfort, and psychosocial stressors【10】【11】.

The significant elevation in stress, anxiety, and depression scores among pregnant participants is consistent with studies that associate pregnancy with increased vulnerability to mood disorders【12】. For instance, Yonkers et al. reported heightened anxiety levels in pregnant women due to uncertainties surrounding fetal health, labor, and delivery outcomes【13】. Similarly, Dennis et al. identified antenatal anxiety as a common issue, particularly in women experiencing complications【14】. However, unlike some studies that found no difference in anxiety prevalence during pregnancy【15】, our findings suggest that pregnant women in our sample are

significantly more affected, possibly due to cultural and socioeconomic factors.

Pregnant women demonstrated significantly higher BMI, blood pressure, and waist-hip ratios compared to their non-pregnant counterparts, reflecting physiological adaptations to pregnancy. These results are consistent with Poon et al., who described the metabolic changes in pregnancy, including increased adiposity and vascular resistance【16】. Browning et al. further highlighted the role of waist circumference and waist-hip ratio as markers for pregnancy-related metabolic changes【17】. In contrast, non-pregnant women in our study had lower BMI and blood pressure, typical of adults in reproductive age without pregnancy-related physiological stress.

Similar to our findings, Robson et al. identified significant correlations between BMI and blood pressure during pregnancy, suggesting that these indicators are critical for monitoring maternal health【18】. Conversely, a study by Agboola et al. found no significant association between BMI and stress scores, indicating variability across populations【19】. This underscores the need for population-specific analyses to account for cultural and genetic factors.

This study's strength lies in its comparative approach, allowing a comprehensive understanding of health differences between pregnant and non-pregnant women. However, reliance on self-reported data may have introduced reporting bias, particularly concerning mental health scores. Additionally, the cross-sectional design precludes causal inferences, and confounding variables such as neuroticism and coping mechanisms were not assessed.

Routine mental health screenings should be integrated into prenatal care using validated tools like the Edinburgh Postnatal Depression Scale or HADS-D. Multi-disciplinary interventions, involving obstetricians, psychologists, and social workers, can address the interconnected physical and mental health needs of pregnant women. Stress-reduction programs, such as mindfulness-based cognitive therapy, have shown promise in reducing pregnancy-related anxiety and should be considered【20】.

Conclusion

This study highlights the significant physical and mental health disparities between pregnant and non-pregnant women, with pregnant women exhibiting higher BMI, blood pressure, and waist-hip ratio, alongside elevated stress, anxiety, and depression scores. These findings emphasize the compounded challenges faced during pregnancy, underscoring the need for holistic care approaches that address both physical and psychological well-being. Understanding these disparities allows healthcare professionals to implement targeted interventions aimed at improving maternal and fetal health outcomes.

Future Recommendations

Future research should focus on longitudinal studies to assess the persistence of psychological distress in pregnant women and its postpartum effects. Understanding how mental health challenges evolve over time can provide valuable insights for early interventions. Additionally, genetic research exploring predispositions to mood disorders and their interplay with pregnancy-related hormonal changes may help identify at-risk populations and guide personalized treatment approaches.

Culturally sensitive interventions should be developed to address societal and familial pressures that influence maternal well-being. Tailoring mental health support to different cultural contexts can enhance its effectiveness and acceptance. Moreover, preventive strategies such as routine mental health screenings and stress-reduction programs should be integrated into both prenatal and general women's healthcare to facilitate early detection and management of psychological distress.

Lastly, lifestyle interventions promoting healthy behaviors, including balanced nutrition, regular physical activity, and smoking cessation, should be encouraged among women of reproductive age. Adopting these practices can help mitigate both physical and mental health risks, ultimately improving overall maternal and fetal outcomes.

Limitations

This study has several limitations that should be acknowledged. The reliance on self-reported data may have introduced bias, particularly in assessing psychological parameters such as stress, anxiety, and depression, as participants' responses could be influenced by personal perception and recall accuracy. Additionally, the cross-sectional design limits the

ability to establish causality between the examined variables, making it difficult to determine whether mental health differences are a direct consequence of pregnancy or influenced by other underlying factors. Furthermore, confounding variables such as social support, coping mechanisms, and pre-existing mental health conditions were not controlled for, which may have impacted the results and introduced additional variability. Lastly, the geographic and cultural scope of the study may restrict the generalizability of the findings, as the experiences of women in different regions or cultural backgrounds may vary significantly. Future research should address these limitations by incorporating longitudinal designs, objective clinical assessments, and diverse population samples to enhance the reliability and applicability of the results.

Conflict of Interest

The authors declare no conflict of interest related to this study.

Acknowledgment

The authors would like to express their gratitude to all the participants for their time and cooperation. Special thanks to the healthcare staff and administration for facilitating data collection. We also acknowledge the support of the hospital personnel for providing the resources necessary to conduct this research.

REFERENCES

1. Yonkers KA, Vigod S, Ross LE. Diagnosis, pathophysiology, and management of mood disorders in pregnant and postpartum women. Lancet. 2011;378(9795):1255–65.
2. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. Br J Psychiatry. 2017;210(5):315–23.
3. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. PLoS Med. 2012;9(12):e1001356.
4. Agboola S, Odetunde K, Maxwell AE. Workplace stress among women of reproductive age: a comprehensive review. J Occup Health. 2020;62(1):e12145.
5. Robson SC, Hunter S, Boys RJ, Dunlop W. Hemodynamic changes during human pregnancy. Am J Obstet Gynecol. 1989;161(5):1211–7.
6. Poon LC, McIntyre HD, Hyett JA, da Fonseca EB, Hod M. The role of BMI in maternal and perinatal outcomes: a systematic review. Nat Rev Endocrinol. 2016;12(5):276–89.
7. Browning LM, Hsieh SD, Ashwell M. A systematic review of waist-to-height ratio as a screening tool for the prediction of cardiovascular disease and diabetes: 0·5 could be a suitable global boundary value. Nutr Res Rev. 2010;23(2):247–69.
8. Lain KY, Catalano PM. Metabolic changes in pregnancy. Clin Obstet Gynecol. 2007;50(4):938–48.
9. Leone T, Matthews Z, Zuanna GD. Impact of contraceptive use on women's health: a multilevel analysis. BMC Public Health. 2015;15:939.
10. Tong VT, Jones JR, Dietz PM, D'Angelo DV, Bombard JM. Trends in smoking before, during, and after pregnancy — Pregnancy Risk Assessment Monitoring System, United States, 2000–2010. Morb Mortal Wkly Rep. 2013;62(SS06):1–19.
11. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. Br J Psychiatry. 2017;210(5):315–23.
12. Lain KY, Catalano PM. Metabolic changes in pregnancy. Clin Obstet Gynecol. 2007;50(4):938–48.
13. Yonkers KA, Smith MV, Gotman N, Belanger K. Typical and atypical antidepressants in pregnancy: prevalence of use and risk of adverse outcomes. J Clin Psychiatry. 2009;70(8):1224–32.
14. Dennis CL, Falah-Hassani K. Identifying women at risk for postpartum depression in the immediate postpartum period. J Affect Disord. 2014;152–154:509–15.

15. Austin MP, Hadzi-Pavlovic D, Saint K, Parker G. Antenatal screening for the prediction of postnatal depression: validation of a psychosocial pregnancy risk questionnaire. Acta Psychiatr Scand. 2005;112(4):310–7.
16. Poon LC, McIntyre HD, Hyett JA, da Fonseca EB, Hod M. The role of BMI in maternal and perinatal outcomes: a systematic review. Nat Rev Endocrinol. 2016;12(5):276–89.
17. Browning LM, Hsieh SD, Ashwell M. Waist-to-height ratio as a screening tool for cardiovascular disease and diabetes: A systematic review. Nutr Res Rev. 2010;23(2):247–69.
18. Robson SC, Hunter S, Boys RJ, Dunlop W. Hemodynamic changes during human pregnancy. Am J Obstet Gynecol. 1989;161(5):1211–7.
19. Agboola S, Odetunde K, Maxwell AE. Workplace stress among women of reproductive age: a comprehensive review. J Occup Health. 2020;62(1):e12145.
Hofmann SG, Sawyer AT, Witt AA, Oh D. The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. J Consult Clin Psychol. 2010;78(2):169–83.