



## Relationship of Systolic Blood Pressure with Well-Being in First Trimester of Pregnancy

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### Declaration

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All authors equally contributed to the study and approved the final manuscript

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### ABSTRACT

**Background:** Maternal health in early pregnancy is influenced by both physiological and psychological factors. Systolic blood pressure (SBP), a key cardiovascular parameter, may be linked to a woman's well-being during the first trimester a period of critical maternal adaptation. **Objectives:** To assess the relationship between systolic blood pressure and well-being among pregnant women in their first trimester using the WHO Well-Being Index. **Method:** A comparative cross-sectional study was conducted at OPD number 13, Gynecology & Obstetrics, Liaquat University Hospital, Hyderabad, over six months. A total of 278 pregnant women aged 15–35 years in their first trimester were selected using non-probability purposive and convenience sampling. Systolic blood pressure was measured using a digital monitor, and well-being was assessed with the WHO-5 Well-Being Index. Data were analyzed using Pearson correlation. **Results:** The majority of participants were aged 15–25 years (55%) and 58.27% were literate. Most (70.86%) had high well-being scores. A moderate negative correlation ( $r = -0.591$ ) was found between systolic blood pressure and well-being, indicating that increased SBP is associated with lower well-being. **Conclusion:** Higher systolic blood pressure levels in the first trimester are significantly associated with lower maternal well-being. Early screening and holistic antenatal care are recommended.

### INTRODUCTION

Pregnancy is a very important and sensitive phase in a woman's life. From the moment pregnancy begins, especially in the first trimester, a woman goes through many changes in her body and emotions. These early weeks bring hormonal shifts, morning sickness, fatigue, mood swings, and anxiety, all of which can affect her health and well-being. (Soma-Pillay et al., 2016)

The World Health Organization describes well-being as a state in which individuals understand their strengths, can cope with the normal stresses of life, work productively, and contribute to their communities. For a pregnant woman, this means feeling mentally and emotionally stable, along with having good physical health, especially in the first trimester when both mother and baby are adjusting. (Organization, 2022)

One important physical measure during pregnancy is systolic blood pressure (SBP), which is the pressure in the arteries when the heart beats. Normally, blood pressure may drop slightly in early pregnancy, but for some women,

it may increase due to stress, anxiety, poor lifestyle, or underlying health conditions. Elevated systolic blood pressure in early pregnancy has been linked to complications such as preeclampsia, stress, fatigue, and reduced emotional well-being. In many cases, high SBP may go unnoticed in the first trimester, but it can silently affect the mother's physical and mental health. (de Haas et al., 2022)

Recent research also shows that higher systolic blood pressure may be associated with poor emotional well-being during pregnancy. It was found pregnant women with high SBP in early pregnancy had lower scores on the WHO-5 Well-Being Index, another study showed that stress and emotional disturbance were more common in women with increased blood pressure in the first trimester. (Zhang et al., 2021)

Despite this evidence, in many low- and middle-income countries like Pakistan, early pregnancy care focuses more on physical health and less on emotional well-being. In most hospitals and clinics, women are not

routinely screened for their mental state during the first trimester. As a result, many women silently suffer from low mood, anxiety, or stress, which may affect their overall well-being and the health of their baby. Addressing mental health early in pregnancy is crucial. (Ahmed et al., 2025)(Bodeker et al., 2020)

WHO (2022) encourages countries to integrate mental health into primary care and maternal health services, especially during pregnancy. However, in Pakistan, this area is still developing, and there is a lack of local research on the connection between physical measures like blood pressure and emotional health in early pregnancy.(Organization, 2022) (Ahmed et al., 2025)

There is also a cultural dimension that may influence how women in Pakistan perceive and respond to stress and emotional changes during pregnancy. In many communities, talking about mental health is stigmatized, and women are expected to remain strong and quiet about their feelings. This absence of open communication may hinder early recognition of mental health issues and postponement of required interventions. It is vital to comprehend cultural attitudes and beliefs in order to develop productive and sensitive maternal health programs.(Omer et al., 2021)

In addition, healthcare systems in Pakistan experiences high patient volumes, insufficient mental health training, and absence resources. Such problems may discourage them from dealing with the physical and psychological requirements of pregnant women in a timely and proper way. There is a need of support and training of health workers in order to fill this gap and ensure complete antenatal care.(Muhammad et al., 2023)

Community awareness programmes play an important role in promoting early screening and emotional support during pregnancy. When families are informed about the importance of maternal mental health, it helps in reducing stigma and encourages women to seek help without hesitation. Trained community health workers can also make a significant difference by identifying early signs of emotional difficulties and referring women for counselling or medical care, especially in the first trimester when timely intervention is most effective. (Castillo et al., 2019)

It is important to explore the relationship between systolic blood pressure and well-being in pregnant women during the first trimester. Most existing research has been done in high-income countries, with limited attention to local or regional contexts. Since the first trimester is a crucial period, timely intervention can help prevent complications later in pregnancy. A better understanding of this link will help healthcare providers identify women at risk and offer appropriate support through counselling, lifestyle guidance, and regular monitoring.

### Objectives

- To analyze the correlation of Systolic Blood Pressure with well-being in pregnant women in the first trimester. Well-being will be measured using the "WHO well-being scale".
- To determine the correlation between systolic blood pressure levels and maternal well-being.

### Research Hypothesis

- There is a significant negative correlation between systolic blood pressure with well-being in the first trimester of pregnancy.

### METHODS

#### Study Design

This research used a comparative cross-sectional study design, where data was collected at one specific time to capture a snapshot of the participants' conditions.

#### Study Setting and Study Duration

Gynecology & obstetrics OPD#13 at the Liaquat University Hospital Hyderabad, the duration of the study was about two months from 22 April to 21 June 2025

#### Study Population and Sampling

**Target Population:** Pregnant mothers visiting Gynecology & obstetrics OPD#13 at the Liaquat University Hospital Hyderabad

**Sampling Technique:** The sampling technique will be non-probability purposive and convenience sampling.

#### Sample Size

- The study included 278 participants, and the sample size was determined using the calculator from Raosoft calculator with the following parameters:
- Confidence level: 95%
- The margin of error: 5%
- Prevalence of : 21%
- 10% more samples were added to deal with the expected problem.
- According to this formula, the estimated sample size was 252.

#### Sample Selection

##### Inclusion Criteria

- Age: Women in the first trimester of pregnancy of age  $\geq 15$  to 35 years.
- Trimester: Women must be in their first trimester of pregnancy.
- Location: Participants must be attending the Outpatient Department (OPD) #13 of Gynecology & obstructive at Liaquat University Hospital in Hyderabad.
- Consent: Women are required to give informed consent to take part in the study.
- Health Status: Participants should not have any severe medical or obstetric complications that could influence systolic blood pressure or well-being.

##### Exclusion Criteria

- Pregnant women who did not consent to participate in the study were excluded.
- Pregnant women with any psychological disability, and taking psychological medications.

### Research Variables

**Independent Variable:** Systolic Blood pressure

**dependent Variable:** Well-being

### Data Collection Instruments

Data was gathered from participants using different sections of the questionnaire.

### Section I: Demographics and Other Variables

It encompasses participant details, including Patient Name, Age, Education, and systolic blood pressure. Systolic Blood Pressure: The top number in a BP reading, measured in mmHg using a digital monitor during the first trimester.

**Section II:** Mental and emotional health was assessed using the highly reliable in previous studies WHO-5 Well-Being Index. (Organization, 2024)

### Data Analysis

- Data analysis was carried out utilizing the Statistical Package for Social Sciences (SPSS) version 22 was used.
- Descriptive statistics, including mean  $\pm$  standard deviation, were calculated for all continuous variables, providing a detailed overview of various factors.
- To examine the relationships between variables, the Pearson correlation test was utilized.
- A p-value of less than 0.05 was considered significant for determining associations.

### Ethical consideration

- This Study includes these Ethical considerations:
- Approval was granted by the Medical Superintendent of Civil Hospitals in Hyderabad.
- Informed consent was taken in written format from participants after explaining to them about the study.
- The identity and confidentiality of participant's information were kept private throughout the data collection, analysis, and interpretation process.

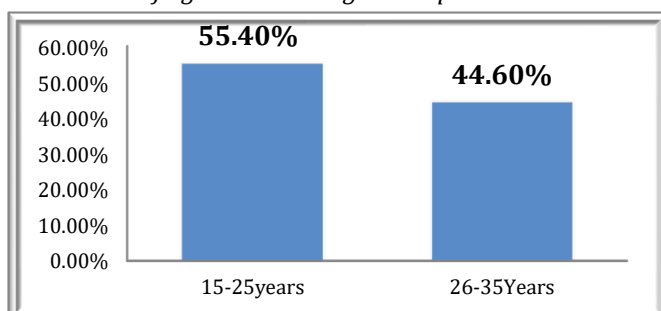
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### RESULTS

A total of 278 women in their 1<sup>st</sup> trimester were studies in my research project. The samples of demographic variables give a meaningful result for understanding the study findings. The demographic variable age of 15-25years that is 55.40% (154) and from the age of 26-35years of participants were 44.60% (124) this is a very young population of my study that is directly related to the my research variables well-being and systolic blood pressure.

**Figure 1**

*Distribution of Age levels among Participants*

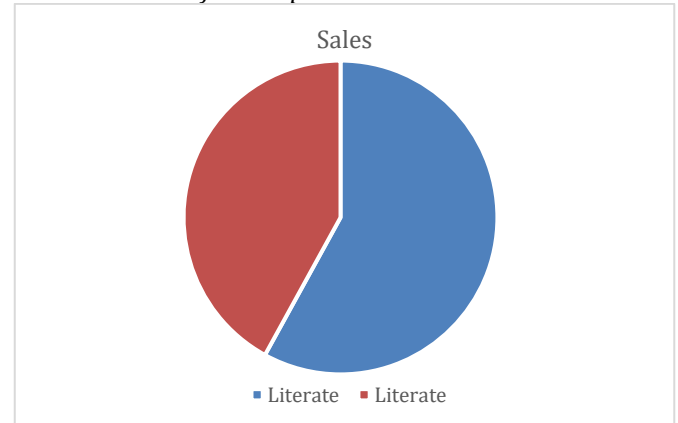


The education level of participant is also impact on systolic blood pressure and well-being, as in my study more than

half of the participant was literate that is 58% and reaming 42% were illiterate. These results indicate that most of the participant had basic knowledge about health awareness, blood pressure management and overall well-being during pregnancy.

**Figure 2**

*Education level of Participants*



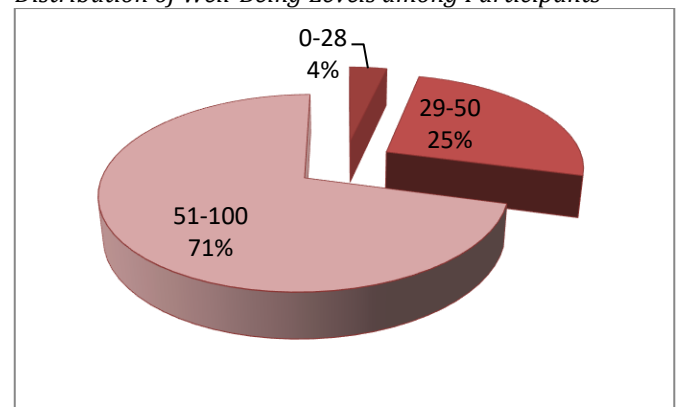
The data indicate that while a majority of the population revealed good mental well-being, that is 70.86% and well-being score range is 51-100. The data shows a low percentage which demonstrated as low well-being 25.54% and well-being score is 29-50 who are experiencing reduced well-being and may be at risk of depression, and only 3.5% are shown as likely depression and needs medical intervention after clinical diagnosis.

**Table 1**

Well-being category	Depression Category	Well-being score	Percentage
Very poor well-being	likely Depression	0-28	3.5%
Low Well-being	possible depression	29-50	25.54%
Good Well-being	(No Depression)	51-100	70.86%

**Figure 3**

*Distribution of Well-Being Levels among Participants*



The Pearson correlation analysis between systolic blood pressure and well-being shows a moderate and significant negative correlation  $-0.591(p<0.01)$  between systolic blood pressure and well-being. This suggests that higher systolic blood pressure is more likely to have lower well-being.

**Table 2**

*Pearson correlation analysis between systolic blood pressure and well-being*

Variable	Systolic Blood Pressure	Well-being
Systolic blood pressure	1.000	-.591(p<0.01)
Well-being	-.591(0.01)	1.000

## DISCUSSION

This research aimed to understand how systolic blood pressure relates to the overall well-being of women in their first trimester of pregnancy. It was found that there's a noticeable inverse link between the two meaning, as blood pressure goes up, the sense of well-being tends to go down ( $r = -0.591$ ,  $p < 0.01$ ). This relationship highlights how deeply connected a woman's physical health is with her emotional state during pregnancy. Previous studies have shown that mental health issues, like stress or depression, can worsen physical outcomes, including elevated blood pressure, which may negatively affect both mother and baby (Achwandi & Khusniyah, 2024).

Interestingly, the majority of participants—about 71%—reported feeling emotionally stable, suggesting that many women experience relatively good mental health early in pregnancy. Still, a small fraction, around 3.5%, showed signs of poor well-being, hinting at possible emotional distress or depression. Such cases are worrisome, as untreated mental health issues during pregnancy can increase the risk of premature delivery, low birth weight, and postpartum depression (Khedagi & Bello, 2021)

When it came to age, more than half of the women (55.4%) were between 15 and 25 years old. Younger mothers often face unique challenges—maybe not so much physically, but emotionally and socially. Fear of the unknown, lack of support, and unplanned pregnancies are some factors that might affect their blood pressure and mental wellness (Bodeker et al., 2020)

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Education appeared to make a meaningful difference too. About 58% of the women were educated, while 42% lacked basic literacy. This matters because educated women tend to better understand health advice, recognize danger signs, and follow through with medical care. As a result, they're more likely to avoid complications like high blood pressure or emotional distress. In fact, studies have shown that maternal education correlates strongly with better self-care and improved pregnancy outcomes.(Veerasetty et al., 2024)

These insights point to a critical need in prenatal care: addressing both the body and the mind. Blood pressure, especially in the early months of pregnancy, might act as a silent warning sign for emotional struggles. If a woman's readings are high and she seems emotionally withdrawn, it could be a cue for healthcare workers to offer counseling or mental health support. Screening tools like the WHO-5 Well-Being Index can be easily used during checkups to spot these issues early (Carvalho et al., 2025)

The findings clearly show that when systolic blood pressure inceases, emotional well-being decreases, especially during the first trimester. Since this stage is important for both mother and baby, it is important to care related to body and the mind. Health professionals should be trained to manage mental health. This approach can lead to healthier pregnancies and better outcomes overall.

## CONCLUSION AND RECOMMENDATIONS

This study found a moderate inverse relationship between systolic blood pressure and well-being in women during the first trimester of pregnancy. It also showed that younger age and lower education levels may influence both factors. These findings highlight the need for early screening of blood pressure and mental well-being during antenatal visits. Educating pregnant women about managing blood pressure and emotional health can improve outcomes. A combined medical and psychological support approach, along with community awareness, can enhance maternal and fetal health.

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