

Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

Renuka Jakhar^{1*}, Poorvi Mathur², Priyanka Siwach³, Meghana Reddy⁴

¹Assistant Professor, School of Physiotherapy SGT University, Gurugram, 122505, Haryana, India

²MPT Student, School of physiotherapy SGT University, Gurugram, 122505, Haryana, India

³Assistant Professor, School of Physiotherapy SGT University, Gurugram, 122505, Haryana, India

⁴MPT Student, School of Physiotherapy SGT University, Gurugram, 122505, Haryana, India

***Corresponding Author-** Dr. Renuka Jakhar, renuka_sphy@sgtuniversity.org

ABSTRACT

Background- Fatigue is a common symptom in pregnancy, especially in the first and third trimester, caused by hormonal changes like increased progesterone, increased blood volume and heart rate, and the physiological demands of supporting fetal development.

Objective- This study aimed to assess the prevalence and severity of fatigue among pregnant women using the FAS questionnaire and to explore its association with demographic and obstetric variables.

Methodology- A cross-sectional survey was conducted among 155 pregnant women attending, Obstetrics and Gynecology OPD using Convenient Sampling Technique. Participants were administered the FAS questionnaire, a 10-item self-reported measure of fatigue. Demographic characteristics and obstetric history were collected. The questionnaire was distributed to pregnant females coming for antenatal checkups; completely filled questionnaires were collected; the data was coded and stored in MS Excel.

Result- Responses were analyzed using chi square test to assess the statistical association between fatigue and age, gravida and trimesters. Severity of fatigue experienced in various trimesters and their effect on QOL, physical and mental wellbeing of the pregnant women was also calculated.

Discussion- Fatigue is highly prevalent among pregnant women and warrants greater attention in routine antenatal care. The FAS questionnaire is a valid tool for assessing fatigue, highlighting the need for early identification and supportive interventions to improve maternal well-being.

Keywords- Antenatal care; Fatigue; Fatigue Assessment Scale; Maternal health; Pregnancy

How to cite this article: Jakhar R, Mathur P, Siwach P, Reddy M. Assessment of fatigue among pregnant women using the Fatigue Assessment Scale: a cross-sectional study. *Int J Drug Deliv Technol.* 2026;16(73s): 1387-1392. DOI: 10.25258/ijddt.16.73s.145

INTRODUCTION

Fatigue is a multi-factor, multidimensional complex state in which the person feels exhausted and loses physical strength and mental capacity [1]. Often associated with difficulty in performing voluntary activities. Overall, about 60% of pregnant women report experiencing fatigue during the third trimester [2].

A common discomfort experienced during pregnancy, can negatively impact quality of life and may lead to serious consequences such as intense labor pain, postpartum depression and increased likelihood of cesarean delivery. It can also adversely influence fetal heart rate, causing fetal distress and raising the risk of instrumental or caesarian births [3]. Studies have shown that shorter sleep duration during the third trimester experience greater fatigue compared to those in the first and second trimesters. As it affects both mind and body, Fatigue is broadly divided into two categories: Mental fatigue and Physical fatigue. Mental fatigue involves the cognitive or perceptual

aspects, resulting from prolonged mental effort or stress. Physical fatigue pertains to the motor system and is characterized by a decreased ability of the muscles to sustain or generate force during activity [4].

Based on physiological principles and theories, fatigue during pregnancy results from an energy imbalance caused by hormonal and metabolic changes, as well as the body's mental and physical adaptation to pregnancy or illness [5].

Multiple studies have demonstrated that acute fatigue tends to manifest at specific times of the day and following particular activities. This type of fatigue is generally transient in nature and typically subsides after adequate rest, particularly a full night's sleep. The extent of discomfort associated with fatigue varies according to its intensity and duration [5]. A wide range of intrinsic and extrinsic factors influence fatigue, including the accumulation of metabolic byproducts, fluctuations in energy levels and enzymatic activity, patterns of rest and activity, circadian rhythms, lifestyle habits, social and

Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

psychological conditions, environmental influences, and the presence, severity, and management of underlying health conditions [6]. During the first trimester of pregnancy, individuals commonly experience a variety of physical symptoms—such as fatigue, nausea, and dizziness—accompanied by emotional fluctuations. In contrast, the second trimester is typically better tolerated, with notable improvements in emotional stability and overall well-being [7].

Hormonal and physiological changes, along with heightened levels of stress, fear, and uncertainty, contribute to the increased vulnerability observed in pregnant women. Exercise can be just as effective as psycho-therapeutic or pharmacological treatments in reducing depressive symptoms. Shakeel et al. (2018) found that women who met the WHO's recommended levels of physical activity during pregnancy had a lower risk of developing postpartum depressive symptoms.

Another study reported positive correlations between engaging in at least 30 minutes of vigorous daily exercise such as brisk walking, cycling, gardening, swimming, tennis, or running and improved maternal wellbeing. Conversely, women who reduced their exercise frequency experienced higher levels of depression and anxiety from the first trimester [8]

Despite being a common and impactful symptom, fatigue in pregnancy is often overlooked in clinical practice. Many women normalize fatigue and avoid reporting it unless specifically asked. Without adequate assessment, women experiencing significant fatigue may remain unsupported, potentially compromising maternal health, emotional well-being, and obstetric outcomes. Documenting the prevalence of fatigue and its associated determinants provides essential insight for improving antenatal care and allows for early intervention through counseling, lifestyle modification, nutritional correction, and physiotherapy-based strategies. This study seeks to address the existing knowledge gap by providing epidemiological data on fatigue among pregnant women in the study setting.

METHODOLOGY

Study design

This cross-sectional study administered a questionnaire to assess severity of Fatigue and its implication on maternal wellbeing. Data collection was done in Obstetrics and Gynecology OPD for a duration of 2 months from August 2025 to October 2025, A total of 200 questionnaires were distributed out of which 155 completely filled questionnaire were collected. Sampling was done using Consecutive sampling technique. Inclusion criteria were-

- Females above 18 years

- Antenatal female with positive Beta-hcg test
- Carrying single foetus.

Exclusion Criteria-

- Pre-existing severe chronic disease eg. Chronic kidney or cardiac condition
- Currently participating in another interventional study

Questionnaire and validity

A self-completion questionnaire Fatigue Assessment Scale (FAS) was administered. The questionnaire consists of 10 items, five questions of the FAS reflect physical fatigue and five assess mental fatigue, the scores on the FAS range from 10 to 50. Each item of the FAS is answered using a five-point, Likert-type scale ranging from 1 ("never") to 5 ("always"). Items 4 and 10 are reverse-scored. Total scores can range from 10, indicating the lowest level of fatigue, to 50, denoting the highest. Reliability and Validity measured by developers Michielsen and colleagues analyzed the scale's psychometric properties and found an internal consistency of 0.90. [9] found The Fatigue Assessment Scale (FAS) has demonstrated excellent internal consistency (Cronbach's $\alpha = 0.90$) and strong construct, convergent, and discriminant validity in clinical populations, supporting its use as a reliable and valid measure of fatigue. The ten questions include physical as well as mental aspects, there are two subscales:

1. Mental fatigue (items 3, 6, 7, 8, and 9) – a measure of the cognitive impacts of fatigue for the client (e.g. lack of motivation, problems beginning tasks, problems thinking).
2. Physical fatigue (items 1, 2, 4, 5 and 10) – a measure of the physical impacts of fatigue for the client (e.g. physical exhaustion, lack of energy).

The total score is calculated by adding up the responses collected, out of total score 50 cutoff scores less than 22 indicates "normal" (i.e. healthy) levels of fatigue, between 22 and 34 indicates mild-to-moderate fatigue, 35 or more indicates severe fatigue

Exposure Variables

Apart from the questionnaire demographic details like age of mother, gravida, period of gestation, parity was also recorded. Questions like "I'm bothered by fatigue" "I get tired easily" and "Physically I feel exhausted" show the physical implication of fatigue on the other hand mental implications are shown by, "I

Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

don't do much during the day" "Mentally I feel exhausted", "I feel no desire to do anything".

After obtaining written informed consent, study objectives and time required to fill the questionnaire were explained to respondents. They were informed that they can refuse to participate and can withdraw from study anytime.

Completed questionnaires were collected by the research team and stored in sealed envelopes, handled with strict confidentiality. The data were subsequently coded and entered into Microsoft Excel for analysis.

Statistical Analysis

The data collected was kept and encoded in MS Excel 2016, to which only the research group had access. Demographic variables were calculated, including age (in years), gravida, and gestational age (in weeks), using descriptive statistics. The chi-square test was used to determine the statistical relationship between the FAS score and named variables age, trimester, and gravida. The level of significance was set at $p < 0.05$.

RESULT

Clinical and sociodemographic characteristics

A total of 155 patients participated in this cross sectional study, Mean age of the participants was 26.54 ± 0.3 , the majority of participants were in age group 18-25 ($n=71$, 45%) followed by age group 26-30 ($n=55$, 35%) and age group 31-40 ($n=30$, 19%). The mean gestational age was 26.86 ± 06 and mean gravida was 1.69 ± 0.06 . Out of total participants 60.8% were in their third trimester, 37.1% were in second trimester and 1.92% were in their first trimester

Fatigue and health status

35.5% females reported mild fatigue having fatigue score less than 22 and 65.5% reported moderate fatigue with total score between 23-34. No participant reported severe fatigue. Shown in Table 2.

The mean scores for each item of the Fatigue Assessment Scale (FAS) was calculated. The highest mean scores were observed for the statements "*I have enough energy for everyday life*" (Mean = 2.6 ± 1.5) and "*When I am doing something, I can concentrate quite well*" (Mean = 2.5 ± 1.6).

Moderate mean values were noted for items such as "*I am bothered by fatigue*" (2.3 ± 1.4), "*I get tired very quickly*" (2.3 ± 1.4), and "*Physically, I feel exhausted*" (2.3 ± 1.5). Lower mean scores were seen for items like "*I have problems to start things*" (1.7 ± 1.1), "*I have problems to think clearly*" (1.8 ± 1.1), and "*I feel no desire to do anything*" (1.8 ± 1.1). Overall, the mean scores highlight a moderate level of fatigue among pregnant women, with physical exhaustion being more prominent than mental fatigue. Table 3 shows the mean and standard deviation for each of the questions of the FAS.

Association between FAS scores and clinical and sociodemographic characteristics

The only variable that displayed significant statistical association with fatigue was patient's age ($p < 0.05$). On the other hand, Trimester and Gravida were not significantly associated with the FAS ($p > 0.05$).

For more details regarding the association between clinical and sociodemographic variables and the FAS, see Table 4

Table 1

Variables	Mean $\pm$ SD
Age group	26.54 ± 0.3
Gestational age	26.86 ± 06
Gravida	1.69 ± 0.06

TABLE 2 The prevalence of fatigue

Fatigue severity	Number	Percentage
Mild	55	35.5%
Moderate	100	65.5%

TABLE 3 The mean and standard deviation for each of the questions of the FAS

Question no.	Question description	Mean	SD
1	I am bothered by fatigue	2.09	0.82
2	I get tired very quickly	2.87	0.76
3	I don't do much during the day	2.59	0.77
4	I have enough energy for everyday life	2.39	0.85
5	Physically, I feel exhausted	2.60	0.73
6	I have problems to start things	2.08	0.86
7	I have problems to think clearly	2	0.66
8	I feel no desire to do anything	2.35	0.65
9	Mentally, I feel exhausted	2.39	0.75
10	When I am doing something, I can concentrate quite well	1.83	0.72

Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

TABLE 4 The association between FAS score and independent variables

Variables	n	p-value
Age		0.02
18-25	70(45.1%)	
26-30	56(35.4%)	
31-40	29(19.3%)	
Trimester		0.15
1	3(1.92%)	
2	57(36.7%)	
3	95(61.2%)	
Gravida		0.88
1	80(51.6%)	
2	50(32.2%)	
3	21(13.5%)	
4	4 (2.5%)	

DISCUSSION

The present study examined the prevalence of fatigue among pregnant women and explored its association with selected maternal characteristics. Our findings indicate a high burden of fatigue in pregnancy, with a significant correlation observed only between fatigue and maternal age. In contrast, trimester of pregnancy and gravida did not show statistically significant relationships with fatigue. These findings highlight the need to reconsider common assumptions about predictors of pregnancy-related fatigue and align with emerging evidence that fatigue is multifactorial rather than solely driven by gestational stage.

The significant association between higher maternal age and increased fatigue in our study is noteworthy. In earlier studies, it is suggested by an increasing number of publications that advancing maternal age may contribute to a reduction in physiological reserve, poorer quality of sleep, and vulnerability to stress-all factors known to exacerbate fatigue [10] [11] In addition, older pregnant women are more often faced

with increasing life responsibilities, such as occupation and caregiving burdens, which may enhance subjective fatigue.

Interestingly, some of the classic studies reported greater fatigue among younger pregnant women [12], which might indicate that the age-fatigue relationship varies across populations and depends on contextual factors like occupation, physical activity patterns, and socioeconomic status. Recent evidence shows that women who have lower levels of dedicated exercise and higher household physical activity report more fatigue [13], which could partly explain age-related differences depending on lifestyle profiles.

Contrary to widely held assumptions, neither trimester nor gravida was significantly correlated with fatigue in our study. Traditionally, fatigue has been described to peak in the first trimester and rise again in late gestation on account of hormonal shifts, metabolic demands, and sleep disruption [5]. However, a number of factors may explain why this trend did not unfold in our sample. First, fatigue may be influenced more by sleep quality, mood, and inflammatory processes than by gestational age alone. [10] have shown the reciprocal relationship between sleep quality and fatigue across pregnancy and suggested that trimester effects are overshadowed by modifiable behavioral predictors.

Secondly, gravida was not statistically significant, which agrees with studies in which parity was not a strong predictor of fatigue [6]. It is also likely that multiparous women learn to cope more adequately, which balances the increased physical burden and diminishes the difference connected with parity. On the other hand, research on postpartum fatigue indicates that the influence of parity might be revealed at later stages rather than during pregnancy [14].

The study findings broadly support recent evidence regarding the multifactorial nature of fatigue in pregnancy. The high prevalence rate in this and other studies [5] underlines fatigue as a significant clinical symptom with meaningful impacts on maternal well-being and quality of life. Similarly, other studies from different populations have identified how nutritional factors (for example, vitamin D), socio-environmental factors, and sleep disturbances interact in their influence on fatigue [15]. These influences may diffuse or mask the effect of gravida and gestational age when measured in a cross-sectional manner, as is seen in our results.

Given its high prevalence and the fact that it disproportionately affects pregnant women of older age, clinicians should engage in age-sensitive screening during antenatal care. For instance, fatigue has been linked to poor physical functioning, poor

Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

adherence to physical activity, and increased psychological distress [10]. The identification of high-risk groups should, for this reason, provide a basis for targeted interventions like sleep counselling, structured exercise programs, and nutritional optimization.

CONCLUSION

This study highlights a substantial frequency of fatigue among pregnant women and reveals that maternal age, rather than trimester or gravida, is the only significant predictor of fatigue in this population. These findings emphasize the multifactorial nature of pregnancy-related fatigue and suggest that physiological, behavioral, and psychosocial factors may apply lesser influence than gestational age alone. The lack of association with trimester and gravida challenges traditional beliefs and points toward the need for further personalized assessment of fatigue, with particular attention to aged pregnant women. Future research should concentrate on relating adjustable contributors similar as sleep quality, physical exertion patterns, stress, and life demands, which may play a central part in shaping fatigue trajectories across gestation.

REFERENCES

1. Behrenz, K. (1999). *Fatigue in pregnancy: A comparative study*. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 28, 11–18.
2. Lee, K. A., Zaffke, M. E., & McEnany, G. (1999). Longitudinal changes in fatigue and energy during pregnancy and the postpartum period. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 28(2), 183–191.
3. Chien, L.-Y., & Ko, Y.-L. (2004). Fatigue during pregnancy predicts caesarean deliveries. *Journal of Advanced Nursing*, 45.
4. De Vries, J., Michielsen, H. J., Van Heck, G. L., & Drent, M. (2004). Measuring fatigue in sarcoidosis: The Fatigue Assessment Scale (FAS). *British Journal of Health Psychology*, 9(3), 279–291.
5. Çınar, S., Dede Çınar, N., Gorpelioglu, S., Uludağ, C., & Sözeri, S. (2007). Prepartum and postpartum acute fatigue and the influencing factors. *Revista Brasileira em Promoção da Saúde*, 20(1), 60–64.
6. Gruet, M., Temesi, J., Rupp, T., Levy, P., Millet, G. Y., & Verges, S. (2013). Stimulation of the motor cortex and corticospinal tract to assess human muscle fatigue. *Neuroscience*, 231, 384–399.
7. Effati-Daryani, F., Mirghafourvand, M., Mohammad-Alizadeh-Charandabi, S., Shiri-Sarand, F., & Zarei, S. (2017). Sleep quality and its relationship with quality of life in Iranian pregnant women. *International Journal of Nursing Practice*, 23(2), e12505.
8. Haßdenteufel Katherine., Feißt, M., Brusniak, K., Lingenfelder, K., Matthies, L. M., Wallwiener, M., & Wallwiener, S. (2020). Reduction in physical activity significantly increases depression and anxiety in the perinatal period: A longitudinal study based on a self-report digital assessment tool. *Archives of Gynecology and Obstetrics*, 302(1), 225–233.
9. Effati-Daryani, F., Mohammad-Alizadeh-Charandabi, S., Mohammadi, A., Zarei, S., & Mirghafourvand, M. (2021). Fatigue and sleep quality in different trimesters of pregnancy. *Sleep Science*, 14(1), 7–13.
10. Watkins, V. Y., O'Donnell, C. M., Perez, M., Zhao, P., England, S., Carter, E. B., Kelly, J. C., Frolova, A., & Raghuraman, N. (2021). The impact of physical activity during pregnancy on labor and delivery. *American Journal of Obstetrics & Gynecology*, 225(4), 430.e1–430.e11.
11. Al-Musharaf, S., et al. (2022). Changes in sleep patterns during pregnancy and their association with vitamin D and other risk factors. *Nutrients*, 14(13), 2757.
12. Ma, D., Kang, Y., Wang, D., Chen, H., Shan, L., Song, C., Liu, Y., Wang, F., & Li, H. (2022). Association of fatigue with sleep duration and bedtime during the third trimester. *Frontiers in Psychiatry*, 13, 952626.
13. Xia, H., et al. (2022). Associations between pro-inflammatory cytokines and prenatal fatigue. *PeerJ*, 10, e13763.

14. Zhu, X., et al. (2022). Trajectory patterns and factors influencing perinatal fatigue among Chinese women from late pregnancy to 6 months after delivery. *PeerJ*, 10, e13760.
15. Malmir, M., Masoumi, S. Z., Kazemi, F., & Refaei, M. (2022). *Effect of squat exercises on fatigue and quality of life (QoL) of pregnant women: A randomized controlled trial study. Journal of Holistic Nursing and Midwifery*, 32(4), 274–282.
16. Yan, S., Jiang, H., Yang, Z., Tang, X., Chen, Z., Chen, Z., Liu, H., & Zhang, F. (2024). Physical activity trajectory during pregnancy and associations with maternal fatigue using a growth mixture modeling approach. *Scientific Reports*, 14, 597.
17. Baattaiah, B. A., et al. (2024). Factors associated with postpartum fatigue: An exploration. *Frontiers in Public Health*, 12, 1398229.
18. Abay, H., et al. (2024). The effect of maternal sleep quality in late pregnancy on prenatal, birth, and early postnatal outcomes. *Journal of Sleep Research*, 33(2), e14031.
19. Fan, Z., et al. (2025). Longitudinal association between sleep quality and fatigue during pregnancy: An observational cohort study. *BMC Psychiatry*, 25, 67.