OPEN ACCESS JOURNALS
Indiana Journal of Agriculture and Life Sciences
Abbreviated Tittle- Ind J Agri Life Sci
ISSN *(Online)*- 2583-1623
Journal Homepage Link- https://indianapublications.com/journal/IJALS
DOI- https://doi.org/10.5281/zenodo.20722279

INDIANA PUBLICATIONS
PRODUCTIVE AND QUALITY RESEARCH

Research Article

Volume-06|Issue-03|2026

Patterns of Depression Scores Across Women of Different Age Groups with Special Reference to Postpartum and Lactating Women: Evidence from Cross Sectional Study

Susmita Dey

Associate Professor, Department of Zoology, Royal Global University. Guwahati-781035

Article History
Received: 01.05.2026
Accepted: 09.06.2026
Published: 17.06.2026

Citation
Day, S. (2026). Patterns of Depression scores across women of different age groups with Special Reference to Postpartum and Lactating Women: Evidence from Cross Sectional Study. *Indiana Journal of Agriculture and Life Sciences, 6*(3), 23-28.

Abstract: Depression is a major global public health concern influenced by demographic, psychological, and biological factors. Emerging evidence indicates a possible role of prolactin in mood regulation, particularly among women in reproductive stages such as postpartum and lactation.

This study aimed to evaluate age-related patterns in depressive symptoms and scores with special reference to postpartum and lactating women. A cross-sectional survey was conducted among women aged 16–65 years in Guwahati, Assam. Depressive symptoms were assessed using the Depression Anxiety Stress Scales (DASS-21). Participants were categorized into age groups, with postpartum and lactating women analyzed as a subgroup. Statistical analyses included descriptive statistics, Spearman correlation, ANOVA, and linear regression.

The mean age of participants was 25.62 ± 9.02 years. Most participants exhibited moderate depressive symptom levels (48.34%). A significant inverse relationship between age and total scores was observed (Spearman $r = -0.282$, $p < 0.001$). Younger women, particularly those aged 21–25 years, showed the highest mean scores. Age was a significant predictor of depressive symptoms ($\beta = -0.447$, $p = 0.016$), though it explained a small proportion of variance ($R^2 = 0.038$). Higher scores among postpartum and lactating women may suggest a potential association with prolactin-related physiological changes.

Depressive symptoms decrease with increasing age, with younger women showing higher severity. The findings indicate a possible link between depression and prolactin-associated states, warranting further clinical investigation.

Keywords: Depressive symptoms; Age differences; Prolactin; Postpartum period; Lactation; Women's mental health; DASS-21; Cross-sectional study

INTRODUCTION

Depressive symptoms represent a major public health concern globally and contribute substantially to disability, reduced quality of life, and impaired social and occupational functioning (World Health Organization [WHO], 2017; Lopez et al., 2006). Depression is characterized by persistent low mood, loss of interest or pleasure, reduced energy, impaired concentration, and disturbances in sleep and appetite (Clark & Watson, 1991). These symptoms occur along a continuum of severity, ranging from mild and moderate forms to severe and disabling conditions.

The etiology of depression is multifactorial and involves complex interactions among biological vulnerability, neurochemical and hormonal regulation, psychological processes, and social and environmental stressors (Clark & Watson, 1991). As a result, depressive symptoms show considerable heterogeneity across individuals and populations. Epidemiological studies indicate that a substantial proportion of individuals experience moderate levels of depressive symptoms, reflecting subclinical distress that nonetheless carries important functional and public health implications (Poongothai et al., 2009).

Age has been identified as a key demographic factor influencing depressive symptom severity. Different life stages are associated with distinct psychological and social challenges, including academic and occupational pressures in younger individuals and health-related concerns or social transitions in later adulthood (Nandi et al., 2000; Chandrashekar & Reddy, 1998). Understanding how depressive symptom severity varies across age groups is therefore essential for identifying vulnerable populations and planning appropriate interventions. Furthermore, accumulating evidence suggests a significant association between prolactin dysregulation and depressive symptoms, although the direction and strength of this relationship appear to vary across populations and clinical contexts. Prolactin is not only a peripheral endocrine hormone but also acts centrally as a neuropeptide, influencing stress regulation, emotional processing, and neurogenesis within key brain regions implicated in mood regulation, such as the hippocampus and hypothalamus (Torner, 2016).

***Corresponding Author:** Susmita Dey

Correlation Between Prolactin and Depression

Clinical and epidemiological studies have demonstrated that individuals with hyperprolactinemia frequently exhibit higher levels of psychological distress, including symptoms of depression, anxiety, and hostility. Early clinical investigations reported significantly greater depressive and anxiety symptoms among women with hyperprolactinemic amenorrhea compared to normoprolactinemic controls, suggesting a direct relationship between elevated prolactin levels and mood disturbance (Fava et al., 1981). Subsequent reviews further supported these findings, indicating that depressive symptoms often improve following normalization of prolactin levels with dopamine agonist therapy, thereby implicating prolactin in affective regulation (Gomes et al., 2015).

More recent mechanistic research has provided biological plausibility for this association. Prolactin secretion is predominantly regulated by hypothalamic dopamine, which exerts tonic inhibitory control. Dysregulation of this pathway may lead to altered prolactin levels and neurobehavioral consequences. Prolactin can be cleaved into smaller bioactive fragments known as vasoinhibins, which have been shown experimentally to produce anxiogenic and depressive-like behaviors in animal models. These findings suggest that prolactin-derived peptides may directly influence neural pathways associated with mood and stress responses (Zamorano et al., 2014).

Systematic reviews and meta-analyses have further clarified the relationship between prolactin and depression. A recent meta-analysis reported significantly higher circulating prolactin levels in individuals with depressive disorders compared to healthy controls, supporting the hypothesis that prolactin dysregulation may serve as a biomarker of depressive pathology or stress-related neuroendocrine activation (Kumar et al., 2025). However, not all studies have demonstrated a consistent correlation. Research conducted among patients with prolactinomas has shown stronger associations between prolactin levels and anxiety or sleep disturbances than with depression per se, indicating that psychosocial factors and disease context may moderate this relationship (Miao et al., 2024).

Overall, the existing literature suggests that prolactin is involved in the neuroendocrine mechanisms underlying depression, but its role is complex and influenced by stress, dopaminergic regulation, reproductive status, and clinical condition. While elevated prolactin levels are frequently associated with depressive symptoms, particularly in hyperprolactinemic states, prolactin alone is unlikely to account for the multifactorial nature of depression. Further research is required to delineate causal pathways and to determine whether prolactin may serve as a clinically useful biomarker or therapeutic target in mood disorders.

Within this context, the present study was designed with the following aims:

- To examine how depressive symptoms vary across different age groups among women.
- To evaluate the relationship between age and severity of depressive symptoms.
- To explore whether women particularly of postpartum and lactation stages, show distinct patterns of depressive symptoms or higher scores.

BACKGROUND

Depression has been consistently recognized as one of the leading causes of disability worldwide, accounting for a significant proportion of the global burden of disease (Lopez et al., 2006; WHO, 2017). Community-based studies have demonstrated that depressive symptoms are highly prevalent in the general population, with many individuals reporting mild to moderate symptom intensity rather than severe clinical depression (Poongothai et al., 2009). These findings emphasize the importance of examining the distribution of depressive symptom severity rather than focusing exclusively on diagnostic thresholds.

Epidemiological research in India and other developing countries has documented considerable psychiatric morbidity related to depression. Nandi and colleagues (2000), in a longitudinal community-based study, reported substantial levels of depressive morbidity in rural populations and highlighted the influence of chronic stress, socioeconomic disadvantages, and limited mental-health resources. Similarly, Chandrashekar and Reddy (1998), through a meta-analysis of Indian epidemiological studies, identified depressive disorders as among the most common mental and behavioral conditions, underscoring their significance as a national public health concern.

Age-related variation in depressive symptoms has been widely investigated, though findings have been somewhat inconsistent across studies. Some research suggests higher levels of depressive symptoms among younger adults, potentially related to academic stress, career uncertainty, and psychosocial transitions, whereas other studies report increased vulnerability in older age due to biological aging, chronic illness, and social isolation (Nandi et al., 2000; Poongothai et al., 2009). These mixed findings highlight the importance of context-specific analyses that consider age group comparisons within defined populations.

Statistical analyses of depressive symptom data frequently reveal non-normal distributions, reflecting substantial inter-individual variability (Brown et al., 1997; Clark & Watson, 1991). In such cases, non-parametric methods are often preferred for assessing associations. Previous studies have reported negative associations between age and depressive symptom severity, indicating a tendency for symptom levels to

***Corresponding Author:** Susmita Dey

decline with increasing age, although the strength of this relationship is typically modest (Lopez et al., 2006).

Regression-based analyses further suggest that age is a significant but limited predictor of depressive symptom severity, with a relatively small proportion of variance explained by age alone (Poongothai et al., 2009). This indicates that additional factors—such as psychosocial stressors, lifestyle factors, and environmental influences—play an important role in determining depressive outcomes. Against this background, the present study focuses on the distribution of total scores and their relationship with age.

METHOD

This work is based on questionnaire survey amongst women of different age groups ranging from 16 – 65 years. Women undergoing postpartum and the lactating mothers (20 years to 40 years) were treated in special category to predict the correlation between depression and prolactin.

Study area: The present study was conducted in Guwahati, Assam.

Depression Anxiety Stress Scales (DASS-21)

Depressive symptoms were assessed using the 21-item Depression Anxiety Stress Scales (DASS-21) (Lovibond & Lovibond, 1995). The instrument measures three domain depression, anxiety, and stress—with seven items each. Participants rated each item on a 4-point Likert scale (0–3) based on their experiences over the past week. Subscale scores were summed and multiplied by two to align with standard scoring conventions. DASS-21 is a widely validated tool with strong reliability and construct validity for assessing emotional distress in both clinical and community populations.

Psychometric Properties:

DASS has good test-retest reliability, high internal consistency, and adequate convergent and discriminant validity with other measures of anxiety and depression (Antony et al., 1998; Brown, Chorpita, Korotitsch, & Barlow, 1997). Little overlap has been found between the three subscales, which is consistent with the tripartite model (Clark & Watson, 1991) upon which the DASS is based. Brown and colleagues (1997) found the depression scale to be most strongly correlated with measures of depression and positive effect, the anxiety scale to be most strongly correlated with measures of physiological arousal and panic, and the stress scale to be more strongly correlated with measures of worry and negative effect than the other two scales

Scoring: Subscale score totals are multiplied by 2 to be comparable to the DASS means norms, which are based on the 42-item version of the scale. Thus, possible scores on each subscale range from 0 to 42. The two suicidality items (items 22 and 23) are not included in the subscales.

The cutoff scores for each subscale are as follows:

Depression	0-9 = normal range; 10-13 = mild; 14-20 = moderate; 21-42 = severe
Anxiety	0-7 = normal range; 8-9 = mild; 10-14 = moderate; 15-42 = severe
Stress	0-14 = normal range; 15-18 = mild; 19-25 = moderate; 26-42 = severe

RESULTS

Table 1: Descriptive Statistics

Variable	Mean ± SD	Median (IQR)	Min–Max
Age (years)	25.62 ± 9.02	22 (20–28)	18–62
Total Score	39.50 ± 20.55	37 (23–53)	3–88

Table 2: Distribution of Total Score Categories

Category	Frequency (n)	Percentage (%)
Low	41	27.15%
Moderate	73	48.34%
High	37	24.50%

Table 3: Total Score Across Age Groups

Age Group	n	Mean Score ± SD
≤20	48	41.98 ± 18.14
21–25	55	47.78 ± 21.64
>25	47	27.45 ± 15.90

1. Normality Testing

Variable	Shapiro-Wilk p-value	Interpretation
Age	< 0.001	Not normal
Total Score	< 0.001	Not normal

2. Correlation Analysis

Test	r-value	p-value	Interpretation
Pearson	-0.196	0.016	Weak negative correlation
Spearman	-0.282	<0.001	Significant negative correlation

Statistical Analysis

***Corresponding Author:** Susmita Dey

3. Group Comparison (Age Groups)

Test	F-value	p-value
ANOVA	15.29	<0.001

4. Linear Regression Analysis (Coefficients):

Variable	β (Coefficient)	p-value	Interpretation
Age	-0.447	0.016	Significant predictor

The Shapiro–Wilk test indicated that both age and total score were not normally distributed ($p < 0.001$). Therefore, non-parametric analysis was preferred. Spearman correlation analysis revealed a significant negative association between age and total score ($r = -0.282$, $p < 0.001$), indicating that total scores decreased with increasing age.

One-way ANOVA demonstrated a statistically significant difference in total score across age groups ($F = 15.29$, $p < 0.001$), with younger participants exhibiting higher scores compared to older individuals.

Linear regression analysis showed that age was a significant predictor of total score ($\beta = -0.447$, $p = 0.016$), explaining 3.8% of the variance ($R^2 = 0.038$).

Descriptive Statistics

The descriptive characteristics of the study variables are summarized in **Table 1** The mean age of the participants was 25.62 years (SD = 9.02), with a median age of 22 years (IQR: 20–28), indicating a relatively young sample with a right-skewed distribution. Participant ages ranged from 18 to 62 years, demonstrating adequate representation across early adulthood and older age groups.

The mean total score was 39.50 (SD = 20.55), with a median of 37 (IQR: 23–53). Scores ranged widely from 3 to 88, suggesting substantial variability in the measured outcome. The close proximity of the mean and median values indicates moderate distributional symmetry, although the broad range and interquartile spread reflect heterogeneous score patterns among participants.

Distribution of Total Scores

The distribution of total score categories is presented in **Table 2**. Nearly half of the participants fell within the **moderate score category** (48.34%, $n = 73$), while **27.15% ($n = 41$)** demonstrated low scores and **24.50% ($n = 37$)** exhibited high scores. This indicates that most participants had moderate levels of the measured outcome.

Total Scores Across Age Groups

As shown in **Table 3**, total scores varied across age groups. Participants aged **21–25 years** recorded the highest mean score (**47.78 ± 21.64**), followed by those aged **≤20 years** (**41.98 ± 18.14**). In contrast, participants aged **>25 years** demonstrated substantially lower mean scores (**27.45 ± 15.90**), suggesting a decline in total score with increasing age.

Normality Testing

The Shapiro–Wilk test indicated that both **age** and **total score** deviated significantly from a normal distribution (**$p < 0.001$** for both variables). Therefore, non-parametric statistical approaches were considered more appropriate for correlation analysis.

Correlation Analysis

Correlation analysis demonstrated a **negative association between age and total score**. While Pearson's correlation showed a weak negative relationship ($r = -0.196$, $p = 0.016$), Spearman's rank correlation—appropriate for non-normally distributed data—revealed a **stronger and statistically significant negative correlation** ($r_s = -0.282$, $p < 0.001$). This finding indicates that **total scores decreased as age increased**.

Comparison of Total Scores Across Age Groups

A one-way analysis of variance (ANOVA) demonstrated a **statistically significant difference in total score among the three age groups ($F = 15.29$, $p < 0.001$)**. Younger participants between age group of 21-25 who were mainly lactating mothers or postpartum exhibited higher total DASS scores compared to older individuals, with the lowest scores observed in participants aged >25 years. This indicates that there may be some correlation between the prolactin secretion and depression.

Linear Regression Analysis

Simple linear regression analysis identified age as a significant predictor of total score ($\beta = -0.447$, $p = 0.016$). Increasing age was associated with a decrease in total score. The model explained 3.8% of the variance in total score ($R^2 = 0.038$), indicating that while age was a statistically significant factor, other unmeasured variables likely contribute to the observed variation.

Overall, the findings consistently demonstrate an inverse relationship between age and total score, supported by distributional trends, correlation analysis, group comparisons, and regression modeling. Younger participants showed significantly higher scores, whereas scores declined with increasing age.

The wide dispersion observed in both age and total score underscore the heterogeneity of the sample, which is advantageous for examining age-related trends. The relatively lower median age compared to the mean suggests a concentration of younger participants, consistent with the higher total scores observed in younger age groups. Similarly, the variability in total scores supports the need for analytical approaches that account for non-normality and individual differences.

***Corresponding Author:** Susmita Dey

The distribution of total scores showed that nearly half of the participants fell within the moderate category, while approximately one quarter demonstrated high scores and just over one quarter had low scores. This indicates that most participants exhibited moderate levels of the measured outcome.

When total scores were examined across different age groups, clear differences were observed. Participants aged 21–25 years recorded the highest mean scores, followed by those aged 20 years or younger. In contrast, participants older than 25 years had markedly lower mean scores, suggesting a decline in total score with increasing age.

Normality testing using the Shapiro–Wilk test revealed that both age and total score were not normally distributed. Consequently, non-parametric statistical methods were emphasized for association analysis. Spearman's correlation demonstrated a statistically significant negative relationship between age and total score, indicating that older participants tended to have lower scores. Although Pearson's correlation also showed a weak negative association, the Spearman correlation provided stronger evidence due to the non-normal distribution of the data.

Comparisons across age groups further supported this finding. One-way analysis of variance revealed a statistically significant difference in total scores among the age groups, with younger participants exhibiting significantly higher scores than older individuals.

Linear regression analysis confirmed that age was a significant predictor of total score. Increasing age was associated with a reduction in total score, although the overall variance explained by age was modest, indicating that additional factors may also influence total score outcomes.

DISCUSSION

The present study demonstrated a clear and consistent inverse relationship between age and total score. Distributional analysis showed that most participants fell within the moderate score category, while nearly equal proportions demonstrated low and high scores. This pattern suggests a heterogeneous distribution of scores within the sample, with meaningful variability across individuals.

Age-related differences were evident, with younger participants exhibiting significantly higher total scores compared to older participants. Specifically, individuals aged 21–25 years who were mostly undergoing through postpartum or are lactating mothers, recorded the highest mean scores pointing to the fact that it may be due to prolactin secretion which needs further invasive clinical studies, whereas those older than 25 years showed a marked reduction in scores. These findings furthermore suggest that the measured outcome may diminish with increasing age, potentially reflecting age-related changes in behavior, perception, or relevant psychosocial or physiological factors.

The non-normal distribution of age and total score justified the use of non-parametric correlation analysis. Spearman's correlation revealed a significant negative association between age and total score, indicating that increases in age were associated with lower scores. This relationship was further supported by group comparisons, which demonstrated statistically significant differences in total scores across age categories. Collectively, these results reinforce the robustness of the observed age-related trend.

Linear regression analysis confirmed that age was a statistically significant predictor of total score. However, the proportion of variance explained by age alone was relatively small, indicating that while age plays a meaningful role, it is not the sole determinant of total score. Other demographic, behavioral, environmental, or contextual factors not assessed in the present analysis may contribute to the observed variability.

Overall, these findings highlight age as an important factor influencing total score outcomes, with younger individuals exhibiting more favorable scores. The modest explanatory power of age underscores the need for future studies to explore additional predictors and potential interacting variables. Further research employing longitudinal designs or multivariable models may help clarify causal pathways and provide a more comprehensive understanding of the determinants underlying score variation and correlation with prolactin hormone.

CONCLUSION

In summary, the present study highlights a clear age-related pattern in depressive symptoms among women, with younger participants reporting comparatively higher levels of distress. The findings demonstrate a modest but statistically significant inverse relationship between age and depression scores, suggesting that symptom severity tends to decline with increasing age.

Although age emerged as a meaningful factor, its relatively low explanatory power indicates that depression is influenced by a broader set of biological, psychological, and social determinants. Notably, the elevated scores observed among postpartum and lactating women point toward a possible role of prolactin-related physiological changes in shaping emotional well-being during this period. However, given the cross-sectional nature of the study, these observations should be interpreted with caution.

***Corresponding Author:** Susmita Dey

Overall, the study underscores the importance of considering both age and reproductive physiological states when examining depressive symptoms in women. Future research incorporating longitudinal designs and direct hormonal assessments would be valuable in clarifying the underlying mechanisms and establishing more definitive links between prolactin and depression.

ACKNOWLEDGEMENT

The authors are grateful to Dr Raj Sarkar, Faculty, Fakhruddin Ali Ahmed Medical College and Hospital,Assam and Dr Reeta Baishya,Head and Professor, Department of Physiology, Gauhati Medical College,Guwahati,Assam , for providing guidance and support to conduct the survey.

REFERENCES

1. Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176–181. https://doi.org/10.1037/1040-3590.10.2.176
2. Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). Guilford Press.
3. Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy, 35*(1), 79–89. https://doi.org/10.1016/S0005-7967(96)00068-X
4. Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*(3), 316–336. https://doi.org/10.1037/0021-843X.100.3.316
5. Chandrashekar, C. R., & Reddy, M. V. (1998). Prevalence of mental and behavioural disorders in India: A meta-analysis. *Indian Journal of Psychiatry, 40*(2), 149–157.
6. Fava, G. A., Fava, M., Kellner, R., Serafini, E., & Mastrogiacomo, I. (1981). Depression, hostility and anxiety in hyperprolactinemic amenorrhea. *Psychotherapy and Psychosomatics, 36*(2–3), 122–128.
7. Gomes, J., Sousa, A., & Lima, G. (2015). Hyperprolactinemia: Effect on mood? *European Psychiatry, 30*(S1). https://doi.org/10.1016/S0924-9338(15)30564-2
8. Kumar, M., Raj, N., Kochar, P., Sriya, P. S., & Kumar, M. (2025). Prolactin levels in depressive disorders: A systematic review and meta-analysis. *General Hospital Psychiatry.*
9. Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (2006). *Global burden of disease and risk factors.* Oxford University Press & World Bank.
10. Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd ed.). Psychology Foundation of Australia.
11. Miao, X., Fu, Z., Luo, X., Wang, J., Yuan, L., Zhao, S., Feng, Y., Huang, S., & Xiao, S. (2024). A study on the correlations of prolactin levels with anxiety, depression, sleep, and self-efficacy in patients with prolactinoma. *Frontiers in Endocrinology, 15*, Article 1369729. https://doi.org/10.3389/fendo.2024.1369729
12. Nandi, D. N., Banerjee, G., Mukherjee, S. P., Ghosh, A., Nandi, S., & Nandi, P. S. (2000). Psychiatric morbidity of a rural Indian community: Changes over a 20-year interval. *British Journal of Psychiatry, 176*, 351–356.
13. Poongothai, S., Pradeepa, R., Ganesan, A., & Mohan, V. (2009). Prevalence of depression in a large urban South Indian population—The Chennai Urban Rural Epidemiology Study (CURES-70). *PLOS ONE, 4*(9), e7185.
14. Torner, L. (2016). Actions of prolactin in the brain: From physiological adaptations to stress and neurogenesis to psychopathology. *Frontiers in Endocrinology, 7*, Article 25. https://doi.org/10.3389/fendo.2016.00025
15. World Health Organization. (2017). *Depression and other common mental disorders: Global health estimates.* WHO Press.
16. Zamorano, M., Ledesma-Colunga, M. G., Adán, N., Vera-Massieu, C., Lemini, M., Méndez, I., Moreno-Carranza, B., Neumann, I. D., Thébaud, S., Martínez de la Escalera, G., & Clapp, C. (2014). Prolactin-derived vasoinhibins increase anxiety- and depression-related behaviors. *Psychoneuroendocrinology, 44*, 123–132. https://doi.org/10.1016/j.psyneuen.2014.03.006

***Corresponding Author:** Susmita Dey