ZIBELINE INTERNATIONAL™ PUBLISHING

ISSN: 2521-0807 (Print)
ISSN: 2521-0424 (Online)
CODEN: MSMAGK

Matrix Science Medica (MSM)

DOI: http://doi.org/10.26480/msm.01.2026.32.36

REVIEW ARTICLE

HORMONAL IMBALANCE AND MOOD DISORDERS ACROSS DIFFERENT AGE GROUPS

Phone Myint Htoo[a], Wana Hla Shwe[b], Jason Lim Yang Jien[c], Nurin Sofia Azman[c], Nur Elijah Suada Rusli[c], Khooi Zhong Yi[c], Chan Foo Khin[c] and Nazmul MHM[c*], Srikumar Chakravarthi[d]

[a]International Medical School, Management and Science University, Shah Alam, Selangor, Malaysia
[b]Faculty of Medicine and Health Sciences, UCSI University, Springhill, Negeri Sembilan, Malaysia
[c]Graduate School of Medicine, Perdana University, Damansara Heights, Kuala Lumpur, Malaysia
[d]Faculty of Medicine, Nursing and Health Sciences, SEGi University, Selangor, Malaysia
**Corresponding Author Email: poorpiku@yahoo.com*

ARTICLE DETAILS

Article History:

Received 27 March 2026
Revised 20 April 2026
Accepted 25 May 2026
Available online 10 June 2026

ABSTRACT

Hormonal imbalance is an important biological factor that can affect emotional regulation, psychological stability, and mood disorder burden across different stages of life. Because endocrine changes occur during adolescence, reproductive age, postpartum, midlife, and later adulthood, their influence on mood may vary by age and hormonal pathway. Existing literature has shown strong links between thyroid dysfunction, reproductive hormone imbalance, postpartum endocrine change, and mood-related outcomes such as depression, anxiety, irritability, and emotional instability. However, much of the current research has focused on specific hormonal conditions or isolated life stages, which has limited a broader understanding of how hormonal imbalance affects mood disorders across age groups in an integrated way. This study was therefore conducted to provide a more age-sensitive understanding of the problem. The article examines major hormonal imbalance categories, compares their emotional effects across life stages, and discusses how endocrine disruption contributes to mood disorder burden in different age groups. Overall, the study concludes that hormonal imbalance has a clear but age-dependent influence on mood disorders, and that age-based endocrine interpretation is important for stronger clinical understanding.

KEYWORDS

Hormonal imbalance, mood disorders, thyroid dysfunction, reproductive hormones, postpartum depression, age groups

1. INTRODUCTION

Hormonal balance plays a major role in emotional stability because hormones influence brain signaling, sleep regulation, stress response, and cognitive processing. When hormone levels change too sharply or remain outside normal physiological ranges, the effects can extend beyond physical symptoms and appear as irritability, anxiety, sadness, mood swings, poor concentration, and reduced resilience. These effects are especially important because hormonal changes do not occur in only one stage of life. They appear at puberty, during the reproductive years, in the menopausal transition, and in later life, but their psychological impact may differ across age groups. Recent literature has shown that hormonal systems are closely linked with mood, stress, and mental functioning, making hormonal imbalance an important topic in mood disorder research (Morssinkhof et al., 2020; Hulubă et al., 2025). This makes the study of hormonal imbalance and mood disorders especially relevant across the life course. Existing research already shows a strong connection between hormonal variation and mood outcomes. A systematic review has shown that sex hormones are closely related to sleep problems and depression, suggesting that endocrine change may affect mood both directly and indirectly through sleep disruption (Morssinkhof et al., 2020). In women moving through menopause, large hormonal fluctuations and declining ovarian function have been repeatedly associated with emotional symptoms, sleep disturbance, and changing mental well-being (Santoro et al., 2021; Badawy et al., 2024). Studies on progesterone and progestogen-related pathways have further shown that these hormones influence stress reactivity, emotional regulation, cognition, and brain function in females (Bencker et al., 2025; Wieczorek et al., 2023). Together, these findings indicate that hormonal imbalance should not be viewed only as an endocrine issue, because it can also shape psychological health in important ways.The literature highlights some specific hormonal conditions and describes direct relationships with mental health. For example, research shows that women with polycystic ovary syndrome experience significant hormonal and metabolic dysregulation, depression, anxiety, and a reduced quality of life. This research shows that women with polycystic ovary syndrome and other menstrual irregularity syndromes are affected by metabolic dysregulation (Yin et al., 2021).

A number of studies have examined depression in conjunction with various forms of thyroid dysfunction. While different studies have shown varying associations of level of thyroid dysfunction, patient age, and patient presentation, the studies suggest that the clinical depression literature remains relevant in the case of patients with thyroid dysfunction and depression (Wildisen et al., 2020; Bode et al., 2021; Bode et al., 2022). It appears that the connection between hormones and mood extends beyond reproductive hormones. Instead, multiple endocrine pathways may influence mental health in different ways across different populations. However, the existing research still has a major limitation. A number of studies focus exclusively on one hormonal condition, such as the menopause, polycystic ovary syndrome, or thyroid dysfunction, or one age group, such as reproductive women or midlife women (Santoro et al., 2021; Yin et al., 2021; Alblooshi et al., 2023). As a result of this, the

Quick Response Code	Access this article online	
	Website: www.matrixscmedica.com	DOI: 10.26480/msm.01.2026.32.36

Cite The Article: Phone Myint Htoo, Wana Hla Shwe, Jason Lim Yang Jien, Nurin Sofia Azman, Nur Elijah Suada Rusli, Khooi Zhong Yi, Chan Foo Khin[c] and Nazmul MHM, Srikumar Chakravarthi (2026). Hormonal Imbalance And Mood Disorders Across Different Age Groups. *Matrix Science Medica, (MSM), 10(1): 32-36.*

relationship across age groups is still not organized. This study aims to fill this gap by providing an integrated account of the relationship of hormonal imbalance to mood disorders across multiple age groups. Existing research provides important insights, but there is significant condition or age-related focus that inhibits generalizing the relationship of hormonal imbalance to mental health across the life continuum. This constitutes a limitation for both the clinical and age-related understanding of the research.

This study comprehensively assesses how hormonal imbalance stands to affect individuals of varying ages and how that, in turn, contributes to mood disorders. The goal is to examine how disorders associated with the hormonal system can be understood as both a biological and psychological phenomenon and how that can lead to specific mood disorders at different points in the lifespan. The goal is to outline the most prominent pathways and survey the existing literature to determine the potential age-related mood disorders and why psychological symptoms can be varied at different points in the lifespan. The hope is to provide an outline of how mood disorders can be affected by the psychological and emotional system and endocrine system. A more integrative approach to the field of the psychological and emotional disorders and endocrine system is crucial to provide a better understanding of the psychological and emotional disorders.

2. METHODOLOGY

The methodology was based on the endocrine imbalance patterns in different age groups, while assessing the outcome of mood disorders like depression, anxiety, and emotional instability (Badawy et al., 2024; Alblooshi, S., Taylor, M., and Gill, N., 2023). The analysis was framed in terms of four major endocrine constructs: thyroid dysfunction, reproductive hormonal imbalance, postpartum hormonal fluctuation, and metabolic disturbances connected to hormones. This structure was chosen because mood symptoms linked to hormones do not arise from one endocrine system alone. Instead, they appear through different biological pathways at different stages of life, which makes age-based and hormone-based comparison necessary.

Thyroid-related evidence was used as one major category because thyroid function has been directly examined in relation to depressive symptoms and emotional health in adult populations (Bode et al., 2021; Ma et al., 2024). Reproductive endocrine evidence formed another major category because polycystic ovary syndrome provides a clear model of hormonal dysregulation accompanied by anxiety and depression (Dybciak et al., 2022). Additional PCOS-based findings were also useful because they showed how endocrine imbalance can increase the broader risk of mental disorders in affected women (Kim et al., 2025). These hormonal categories made it possible to compare mood-related effects across more than one endocrine system rather than limiting the article to a single disorder.

The review was then organized by age group so that hormonal effects could be interpreted more precisely. The evidence was broadly considered under adolescence, reproductive-age adulthood, midlife and menopausal transition, and later adulthood where relevant. This step was important because the same hormonal imbalance may not produce the same emotional effect at every age. For example, PCOS-related mood burden is mainly visible in adolescent and reproductive-age groups (Dybciak et al., 2022). Postpartum hormonal fluctuation, by contrast, belongs to a specific reproductive period after childbirth and has been studied in direct relation to depression risk (Larsen et al., 2025). Thyroid-related mood changes may appear across a wider adult age range, which made thyroid evidence useful for broader comparison (Ma et al., 2024).

Mood outcomes were classified into broad psychological domains to improve consistency across studies. One domain included depressive symptoms such as low mood, sadness, hopelessness, and clinically significant depression. A second domain included anxiety-related outcomes such as worry, tension, irritability, and emotional instability. A third domain included broader psychological well-being, including emotional burden, mental adjustment, and quality of life. This classification was necessary because endocrine studies do not always measure the same emotional outcome. Some studies focus mainly on postpartum depression, while others emphasize anxiety and psychological distress in hormone-related disorders such as PCOS (Thul et al., 2020;Humeniuk et al., 2025). This grouping helped create a common framework for interpreting results across different endocrine conditions.

The comparison also considered whether the reported findings reflected risk, association, or improvement after intervention. This was important because the included literature was not limited to one type of evidence. Some studies examined whether hormonal change increased the likelihood of mood symptoms, as seen in postpartum hormonal contraceptive exposure and depression risk research (Larsen et al., 2025). Other studies examined whether management strategies could improve emotional outcomes in hormone-related conditions, as shown in hypothyroidism-related quality-of-life intervention research (Ahmad et al., 2023). By separating association-based findings from improvement-based findings, the methodology created a clearer interpretation of how hormonal imbalance affects mood and how those effects may be modified. The methodological structure used in this study is summarized in Figure 1, where the hormonal categories, age-group stratification, and mood outcome domains are arranged in one integrated framework.

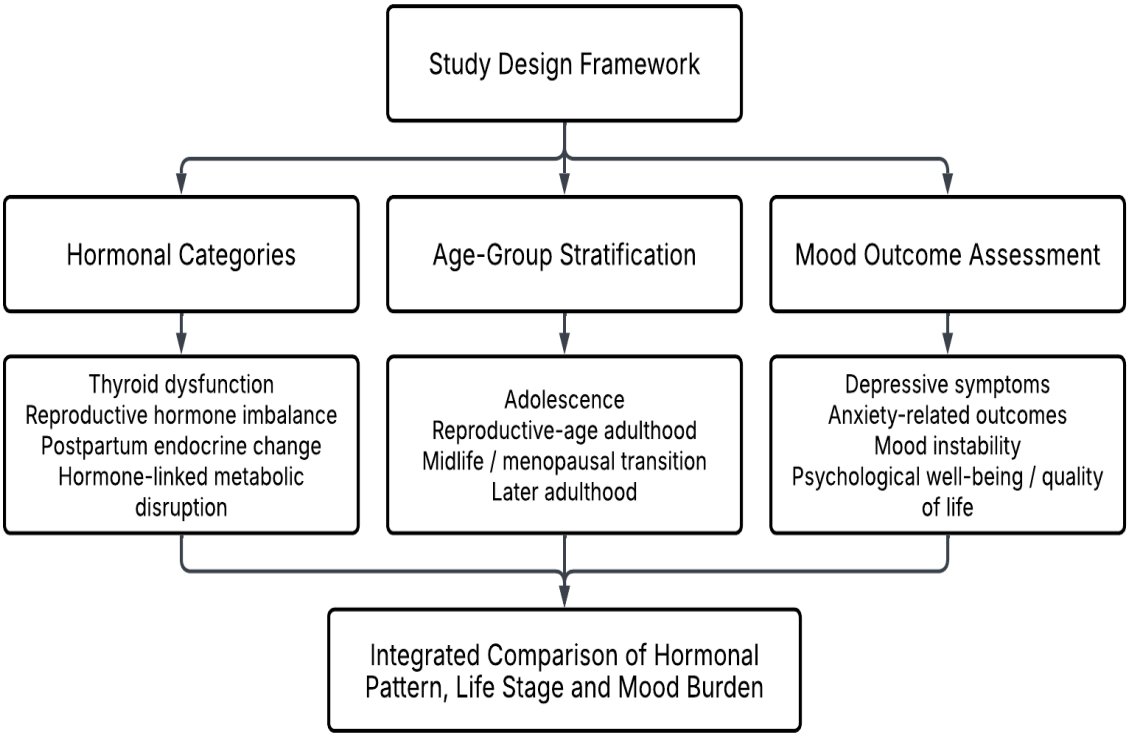

Figure 1: Study Design Framework for Hormonal Categories, Age-Group Stratification, and Mood Outcome Assessment

Each selected study was therefore examined using four main points: hormonal category, age group, type of mood outcome, and overall direction of the result. This allowed the evidence to be interpreted in a structured way. A study could show increased emotional burden, lower psychological well-being, mixed findings, or improvement after treatment or support. This format was especially useful because some endocrine conditions, such as PCOS, show both chronic psychological burden and increased psychiatric risk (Kim et al., 2025). Other conditions, such as postpartum hormonal change, are more strongly linked with stage-specific depressive patterns (Thul et al., 2020). The method therefore supported both disorder-based and life-stage-based interpretation.Table 1 summarizes the methodological classification framework used to organize the reviewed evidence. The table shows how each hormonal category was linked with a relevant age context, dominant mood outcome domain, and interpretation focus.

This structure helped maintain consistency across studies that used different clinical populations, endocrine conditions, and psychological outcome measures. It also allowed the review to compare hormonal imbalance as a life-course mental health issue rather than as separate disorder-specific findings.

Table 1: Methodological Classification Framework for Hormonal Imbalance and Mood Disorder Assessment

Hormonal Category	Main Age Context	Mood Outcome Domain	Methodological Interpretation Focus
Thyroid dysfunction	Adult and later adulthood groups	Depressive symptoms, fatigue, reduced psychological well-being	Used to assess broad endocrine influence on mood across adult life
Reproductive hormonal imbalance	Adolescence and reproductive-age adulthood	Anxiety, depression, emotional instability, body-image distress	Used to examine chronic endocrine-linked psychological burden
Postpartum hormonal fluctuation	Post-childbirth reproductive period	Depressive symptoms, emotional instability, psychological distress	Used to assess stage-specific mood vulnerability after rapid hormonal change
Menopausal hormonal transition	Midlife adulthood	Irritability, sleep-related distress, low mood	Used to evaluate mood instability during reproductive aging
Hormone-related metabolic disturbance	Mainly reproductive-age and adult groups	Anxiety, depressive burden, reduced quality of life	Used to connect metabolic strain with hormone-related mental health outcomes

Greater importance was given to systematic reviews, meta-analyses, and large observational studies because they provide stronger overall evidence. Intervention studies were also retained when they added clinically meaningful information about emotional change after treatment or management support (Ahmad et al., 2023).

The final interpretation depended on the relevance of the hormonal condition, the clarity of the age-group context, the strength of the mood-related outcome, and the consistency of the findings across studies. In this way, the methodology created a structured basis for understanding hormonal imbalance and mood disorders as a life-course mental health issue rather than as isolated endocrine events.

3. Results and Discussion

The results show that hormonal imbalance is closely linked with mood disorder burden, but the pattern is not the same at every age. Instead of producing one fixed emotional response, hormonal disruption appears to interact with life stage, biological sensitivity, and clinical context. Across the reviewed evidence, mood burden was most visible when hormone changes were persistent, clinically significant, or combined with stress-related physical symptoms such as sleep disturbance, fatigue, irregular cycles, metabolic dysfunction, or reproductive change. This means that hormonal imbalance should not be understood only as a biochemical abnormality. It should also be understood as a condition that can alter emotional regulation, daily functioning, and mental stability.

Figure 2 presents the comparative mood disorder burden across hormonal imbalance types and age groups. The figure shows that reproductive hormone imbalance is especially important in adolescence and reproductive-age adulthood, while postpartum endocrine fluctuation creates a strong and more concentrated depressive risk in the reproductive period after childbirth. Midlife and menopausal hormonal shifts also show a clear emotional effect, particularly through mood instability, sleep disturbance, and depressive burden. Thyroid-related imbalance appears more broadly across adult age groups and shows a more continuous pattern rather than one restricted life-stage peak. This result is important because it shows that the relationship between hormones and mood depends not only on the type of hormone involved but also on the age at which the endocrine change occurs.

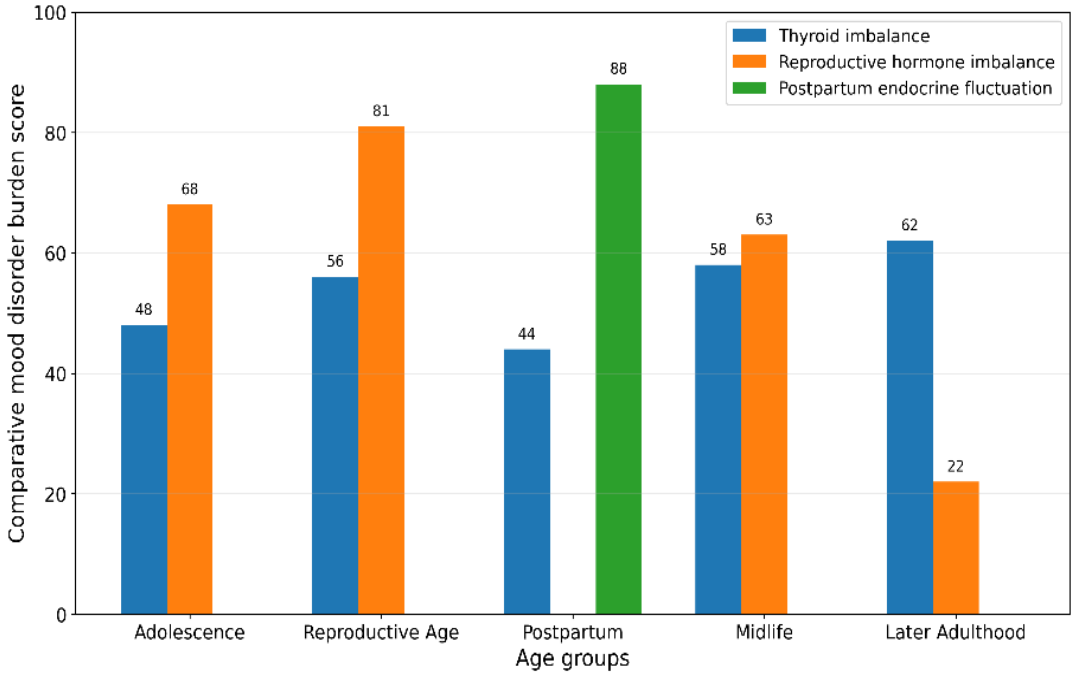

Figure 2: Comparative Mood Disorder Burden Across Hormonal Imbalance Types and Age Groups

One of the clearest findings is that reproductive hormone imbalance produces a different emotional profile depending on life stage. In adolescence and early adulthood, hormonal dysregulation often appears together with irritability, anxiety, mood fluctuation, and lower emotional confidence. In reproductive-age women with endocrine disorders such as PCOS, the burden becomes more persistent and may include depression, anxiety, body-image distress, and reduced quality of life. It is apparent that imbalances in the reproductive hormones have both biological and psychosocial ramifications. These changes ultimately alter an individual's ability to manage reproductive health and daily tasks that sustain their self-image and well-being.

Postpartum hormonal changes rapidly shift the body's hormones. This period is characterized by depressive and psychological instabilities. This is particularly concerning because the burden of mood disturbances postpartum is sharper than with other hormonal changes. It is more severe and time constrained. Postpartum mood changes don't follow the behaviors seen with thyroid dysfunction and other longstanding endocrine disorders. Typically, mood changes postpartum occur when hormonal changes occur with sleep deprivation, the physical demands of being a caregiver, and the recovery process. Postpartum hormonal changes are a critical period when mood disorders are at a heightened risk.Table 1 shows the relationship between age, hormonal imbalance, and their mood symptoms. It also shows the relationship between the symptoms and their clinical value. Regarding younger groups, the endocrine imbalance is often associated with mood anxiety, emotional instability and body image concerns. With the reproductive age and postpartum groups, the burden of mood depressive symptoms is more evident, particularly when there are rapid hormonal shifts. In midlife, the emotional picture becomes more mixed, with mood instability, irritability, sleep-related distress, and depressive symptoms appearing together. Thyroid-related imbalance remains clinically important because it cuts across age groups and often presents with low mood, fatigue, poor concentration, and reduced psychological well-being.

Table 2: Age-Specific Hormonal Imbalance Patterns, Dominant Mood Symptoms, and Clinical Interpretation

Age Group	Hormonal Imbalance Type	Dominant Mood Outcome	Mood Burden Score
Adolescence	Pubertal / reproductive hormone fluctuation	Mood instability, anxiety	68
Reproductive Age	PCOS / reproductive hormone imbalance	Depression, anxiety	81
Postpartum	Postpartum endocrine fluctuation	Depressive symptoms	88
Midlife	Menopausal hormonal transition	Irritability, low mood	63
Later Adulthood	Thyroid-related endocrine imbalance	Low mood, fatigue	62

Figure 3 shows the symptom-level mood burden across hormonal imbalance categories. Depressive symptoms are highest during postpartum endocrine fluctuation, while anxiety and mood instability are more visible in reproductive and pubertal hormonal imbalance. Thyroid-related imbalance shows a broader symptom pattern, mainly involving low mood, fatigue, and reduced psychological well-being. This supports the finding that each hormonal condition produces a different mood-symptom profile.

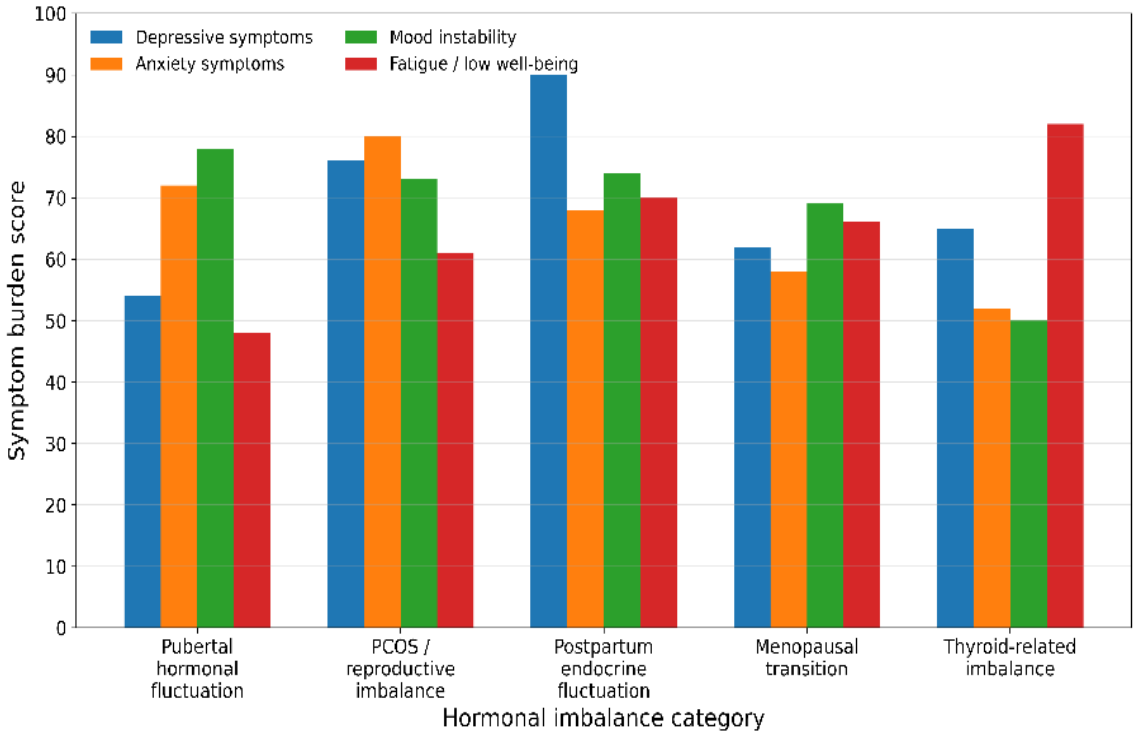

Figure 3: Symptom-Level Mood Burden Across Hormonal Imbalance Categories

Another important result is that hormonal imbalance affects mood through overlapping mechanisms rather than through one single route. Sleep disruption, stress sensitivity, fatigue, metabolic strain, and cognitive-emotional instability appear repeatedly in different hormonal conditions. This helps explain why some patients present with a mixed psychological picture instead of one isolated mood symptom. It also explains why clinical interpretation should not stop at identifying the hormone disorder alone. The emotional expression of hormonal imbalance must be read together with age, symptom burden, and stage specific vulnerability. This is one of the key strengths of an age-stratified discussion. Figure 4 shows the relative contribution of key mechanistic factors to mood disorder risk under hormonal imbalance. Sleep disturbance showed the highest contribution score, followed by stress sensitivity and cognitive-emotional instability.

Fatigue and metabolic strain also contributed to mood burden, but their scores were lower than sleep- and stress-related mechanisms. This result supports the interpretation that hormonal mood burden is driven by multiple interacting mechanisms, with sleep and stress pathways showing the strongest influence.

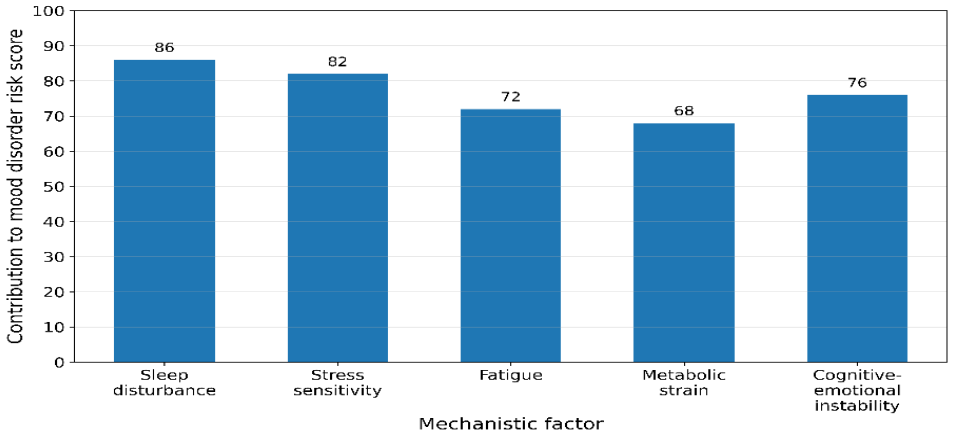

Figure 4: Mechanistic Factor Contribution Scores for Mood Disorder Risk Under Hormonal Imbalance

This study shows that hormonal imbalance has a clear influence on mood disorders, but the effect is not the same at every age. The life stage and hormonal pathways select what moods to impact, and this study recognizes hormonal moods burdens in each stage of life. The study found that inadequate reproductive hormones correlated with moods during adolescence and reproductive age. Postpartum changes correlated with depressed moods the most. Thyroid hormones spanned adult life. This study shows the importance of age when creating health policies to address imbalances in hormones.

The study shows that when hormones are imbalanced, health outcomes are not only mood related. All mental health outcomes are impacted; including, depressed mood, anxiety, irritability, emotional instability, mood changes affecting sleep, and decreased psychological well-being. Most people go through these symptoms when changes to hormonal systems are severe or extended. This means that the emotional burden of hormonal imbalance is shaped not only by the hormone disorder itself but also by the life stage in which it occurs. As a result, age-group interpretation becomes important for stronger clinical understanding and better mental health assessment. It also helps explain why similar hormonal changes may produce different mood outcomes across different age groups.

4. Conclusion

Overall, the article supports a more integrated view of endocrine and emotional health. Hormonal imbalance should be considered an important biological contributor to mood disorder burden across the life course. The findings suggest that clinical evaluation should give greater attention to age-specific hormonal patterns when interpreting mood symptoms. Future research should continue to improve this area through stronger comparative studies and more precise age-based endocrine analysis. Such work can help build more accurate and age-informed approaches to mood disorder assessment and care.

References

Ahmad, A. M., Serry, Z. H., Abd Elghaffar, H. A., Ghazi, H. A., and El Gayar, S. L., 2023. Effects of aerobic, resistance, and combined training on thyroid function and quality of life in hypothyroidism. A randomized controlled trial. Complementary therapies in clinical practice, 53, Pp. 101795.

Alblooshi, S., Taylor, M., and Gill, N., 2023. Does menopause elevate the risk for developing depression and anxiety? Results from a systematic review. Australasian Psychiatry, 31(2), Pp. 165-173.

Badawy, Y., Spector, A., Li, Z., and Desai, R., 2024. The risk of depression in the menopausal stages: a systematic review and meta-analysis. Journal of affective disorders, 357, Pp. 126-133.

Bencker, C., Gschwandtner, L., Nayman, S., Grikšienė, R., Nguyen, B., Nater, U. M.,and Comasco, E., 2025. Progestagens and progesterone receptor modulation: Effects on the brain, mood, stress, and cognition in females. Frontiers in Neuroendocrinology, 76, 101160.

Bode, H., Ivens, B., Bschor, T., Schwarzer, G., Henssler, J., and Baethge, C., 2021. Association of hypothyroidism and clinical depression: a systematic review and meta-analysis. JAMA psychiatry, 78(12), Pp. 1375-1383.

Bode, H., Ivens, B., Bschor, T., Schwarzer, G., Henssler, J., and Baethge, C., 2022. Hyperthyroidism and clinical depression: a systematic review and meta-analysis. Translational Psychiatry, 12(1), Pp. 362.

Dybciak, P., Humeniuk, E., Raczkiewicz, D., Krakowiak, J., Wdowiak, A., and Bojar, I., 2022. Anxiety and depression in women with polycystic ovary syndrome. Medicina, 58(7), Pp. 942.

Hulubă, I. P., Crecan-Suciu, B. D., Păunescu, R., and Micluția, I. V., 2025. The link between sex hormones and depression over a woman's lifespan. Biomedical reports, 22(4), Pp. 71.

Humeniuk, E., Dybciak, P., Raczkiewicz, D., Powrózek, T., Malecka-Massalska, T., Andrzejczyk, A., Bojar, I., 2025. Anxiety in polycystic ovary syndrome–a meta-analysis. Annals of Agricultural and Environmental Medicine, 32(2), Pp. 190-197.

Kim, Y., Chae, K., Kim, S., Kang, S., Yoon, H., and Namkung, J., 2025. Risk of Mental Disorders in Polycystic Ovary Syndrome: Retrospective Cohort Study of a Korean Nationwide Population-Based Cohort. International Journal of Women's Health, Pp. 627-638.

Larsen, S. V., Ozenne, B., Mikkelsen, A. P., Liu, X., Bang Madsen, K., Munk-Olsen, T., Frokjaer, V. G., 2025. Postpartum hormonal contraceptive use and risk of depression. JAMA network open, 8(3), e252474.

Ma, Y., Wang, M., and Zhang, Z., 2024. The association between depression and thyroid function. Frontiers in endocrinology, 15, 1454744.

Morssinkhof, M. W. L., Van Wylick, D. W., Priester-Vink, S., Van Der Werf, Y. D., Den Heijer, M., Van Den Heuvel, O. A., and Broekman, B. F. P., 2020. Associations between sex hormones, sleep problems and depression: A systematic review. Neuroscience & Biobehavioral Reviews, 118, Pp. 669-680.

Santoro, N., Roeca, C., Peters, B. A., and Neal-Perry, G., 2021. The menopause transition: signs, symptoms, and management options. The Journal of Clinical Endocrinology & Metabolism, 106(1), Pp. 1-15.

Thul, T. A., Corwin, E. J., Carlson, N. S., Brennan, P. A., and Young, L. J., 2020. Oxytocin and postpartum depression: A systematic review. Psychoneuroendocrinology, 120, 104793.

Wieczorek, K., Targonskaya, A., and Maslowski, K., 2023. Reproductive hormones and female mental wellbeing. Women, 3(3), Pp. 432-444.

Wildisen, L., Del Giovane, C., Moutzouri, E., Beglinger, S., Syrogiannouli, L., Collet, T. H., Rodondi, N., 2020. An individual participant data analysis of prospective cohort studies on the association between subclinical thyroid dysfunction and depressive symptoms. Scientific reports, 10(1), Pp. 19111.

Yin, X., Ji, Y., Chan, C. L. W., and Chan, C. H. Y., 2021. The mental health of women with polycystic ovary syndrome: a systematic review and meta-analysis: X. Yin et al. Archives of women's mental health, 24(1), Pp. 11-27.