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Original Research Article

ASSOCIATION OF ANXIETY AND DEPRESSIVE SYMPTOMS WITH HYPOTHYROIDISM

RAZAQ S[1], MANAN K[2], SAMI M[1], KABIR W[1], KOKAB U[3]

[1]*Department of Endocrinology, Hayatabad Medical Complex, Peshawar, Pakistan*
[2]*Department of Endocrinology, Lady Reading Hospital, Peshawar, Pakistan*
[3]*Department of Dermatology, Hayatabad Medical Complex, Peshawar, Pakistan*
**Corresponding author email address: dr.sajjid1992@gmail.com*

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ABSTRACT

Background: *Hypothyroidism is a common endocrine disorder frequently associated with psychiatric manifestations. Depression and anxiety are among the most reported symptoms, significantly affecting patients' quality of life. Understanding this association is crucial for early diagnosis and holistic management.* ***Objective:*** *To establish the relationship between anxiety, depression, and hypothyroidism.* ***Study Design:*** *Cross-sectional study.* ***Setting:*** *Hayatabad Medical Complex, Peshawar, Pakistan.* ***Duration of Study:*** *10-09-2024 to 10-03-2025.* ***Methods:*** *A total of 80 diagnosed cases of hypothyroidism were enrolled. Among them, 50 (62.5%) were female and 30 (37.5%) were male. The Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Scale (HAM-A) were administered to assess depression and anxiety levels. Descriptive statistics were applied to evaluate prevalence, gender distribution, and symptom profiles.* ***Results:*** *Out of 80 patients, 74 (92.5%) exhibited varying degrees of depression on HDRS, including 46 females (62.1%) and 28 males (37.8%). Anxiety was identified in 68 patients (85.0%) on HAM-A, with 42 females (61.7%) and 26 males (38.2%). The most frequent depressive symptoms were depressed mood and gastrointestinal somatic complaints, while anxious mood and depressed mood were the predominant anxiety features.* ***Conclusion:*** *Hypothyroidism is strongly associated with psychiatric manifestations, particularly depression and anxiety. Routine psychological screening should be integrated into the management of hypothyroid patients to ensure timely intervention and improved outcomes.*

Keywords: Anxiety, Depression, Endocrine Disorder, Hamilton Anxiety Scale (HAM-A), Hamilton Depression Rating Scale (HDRS), Holistic Management, Hypothyroidism, Psychiatric Manifestations, Quality of Life, Screening

INTRODUCTION

Hypothyroidism is a condition characterized by insufficient production of thyroid hormones, leading to various physiological and psychological disruptions. The global prevalence of hypothyroidism varies but generally affects a significant proportion of the population, with women being disproportionately impacted (1). Emerging research underscores the multifaceted relationship between hypothyroidism and mental health disorders, particularly anxiety and depression, with estrogen playing a significant regulatory role in women (2). This relationship is crucial, as thyroid hormones are known to play a critical role in brain function, mood regulation, and cognitive processes (3).

A growing body of evidence highlights that individuals with hypothyroidism often experience higher rates of depressive and anxiety symptoms compared to those with normal thyroid function (4). For instance, studies indicate that patients with overt hypothyroidism exhibit pronounced emotional disturbances, including increased levels of anxiety and depression (5, 6). Furthermore, physiological mechanisms linking thyroid dysfunction to mood disorders could involve neurobiological pathways, wherein thyroid hormones directly influence neurotransmitter levels, affecting overall mental health (3). It is also suggested that chronic stress and hypothyroidism share a bidirectional relationship, with stress potentially exacerbating thyroid dysfunction and vice versa (7).

In clinical practice, screening for mental health issues in patients diagnosed with hypothyroidism is essential due to the significant overlap in symptomatology (8). Additionally, the treatment implications of this relationship cannot be overstated. Effective management of hypothyroidism, primarily through levothyroxine therapy, has been shown to alleviate numerous psychological symptoms, indicating that optimizing thyroid hormone levels can positively impact mental health outcomes (9). Nonetheless, some patients report persisting mood disorders even after achieving euthyroid status, suggesting potential underlying factors that require further investigation (5).

In the context of Pakistan, where societal and cultural barriers often impede mental health awareness and treatment, the implications of this association are particularly significant. The stigma surrounding mental health can lead to underdiagnosis and mismanagement of both hypothyroidism and accompanying psychological disorders (10). Given the relatively high incidence of hypothyroidism in the region, along with a prevalence of unrecognized mental health issues, there is an urgent need for integrated healthcare approaches that encompass both endocrine and psychological assessments (8). Addressing these health disparities is vital for improving patient outcomes and the quality of life for those affected by both hypothyroidism and mental health conditions in Pakistan.

METHODOLOGY

A cross-sectional study was conducted at Hayatabad Medical Complex after receiving approval from the Institutional Ethics Committee. The research was carried out over six months, from October 9, 2024, to March 10, 2025. A total of 80 patients were enrolled based on predefined inclusion and exclusion criteria, and each participant provided written informed consent prior to inclusion. The exclusion criteria were designed to minimize confounding factors and included patients already diagnosed with depressive or anxiety disorders, those with substance addiction, individuals suffering from other chronic systemic illnesses, and patients with dementia or delirium. Patients with reduced cognitive function and those with an

education level below primary education were also excluded from the study. By applying these criteria, the researchers aimed to ensure a more homogeneous study population and improve the reliability of the results.

The inclusion criteria consisted of patients aged between 18 and 45 years, from both genders, who were willing to provide informed consent. Before participating, all patients were given a detailed explanation of the study's objectives, ensuring that the principles of informed consent were strictly followed. This practice upheld transparency and respect for the autonomy of the participants.

Data collection involved gathering sociodemographic details using a specially designed proforma. For the assessment of depression, the Hamilton Depression Rating Scale (HDRS or HAM-D) was employed. This widely recognized clinician-administered tool, regarded as the gold standard in clinical research for evaluating depressive symptoms, consists of 17 items (HDRS-17) and typically takes 20 to 30 minutes to administer. It assesses various domains, including mood, guilt, suicidal thoughts, sleep disturbances, irritability, anxiety, weight changes, and somatic complaints. While valuable in determining the severity of depression, HDRS is not a diagnostic tool in itself. To evaluate anxiety, the Hamilton Anxiety Rating Scale (HAM-A) was utilized, providing a standardized approach to measure the severity of anxiety symptoms in the study population.

RESULTS

The sociodemographic profile of the participants revealed that most were aged 26–35 years (n = 49; 18 males, 31 females), followed by those aged 36–45 years (n = 20; 8 males, 12 females), and 18–25 years (n = 11; 4 males, seven females). In terms of education, the majority had attained a school-level education (n = 48; 32 males, 16 females), while 22 participants (17 males, 5 females) had completed college, and 10 participants (7 males, three females) held a university degree. Most participants were married (n = 72; 30 males, 42 females), whereas 8 (5 males, three females) were single, indicating that the sample was predominantly composed of married individuals in their late twenties to mid-thirties, with a school education being the most common academic qualification. (Table 1)

The Hamilton Anxiety Rating Scale (HAM-A) is one of the earliest tools specifically designed to measure the severity of anxiety symptoms in adults, adolescents, and children. It consists of 14 items, each representing a cluster of symptoms. It assesses two main components: psychic anxiety, which includes mental irritability and psychological distress, and somatic anxiety, which involves the physical manifestations of anxiety. The scale is clinician-administered and typically requires about 10–15 minutes to complete. Each item is rated on a scale from 0 to 4, where 4 indicates the most severe presentation. The total score reflects the overall severity of anxiety.

Similarly, the Hamilton Depression Rating Scale (HDRS) is used to assess the level of depression. The scoring criteria classify depression severity as follows: a score of less than 6 is considered normal, 7–17 indicates mild depression, 18–24 represents moderate depression, and a score above 24 reflects severe depression. For the HAM-A, the grading is identical: less than 6 indicates normal anxiety levels, 7–17 corresponds to mild anxiety, 18–24 indicates moderate anxiety, and a score above 24 denotes severe anxiety. These grading systems offer a structured method for categorizing individuals based on their symptom severity, which is helpful for both clinical practice and research purposes.

The sociodemographic data of participants are summarized in Table 1, detailing characteristics such as age, gender, education level, occupation, and other relevant background variables that provide context for interpreting the study findings.

Table 1: Sociodemographic data

Parameters	Male	Female	Total
Age			
18-25	04	07	11
26-35	18	31	49
36-45	08	12	20
Educational Level			
School	32	16	48
College	17	05	22
University	07	03	10
Marital Status			
Single	05	03	08
Married	30	42	72

Table 2: Hamilton depression rating scale Grading

Grading	Score	Male	Female	Total
Normal	≤06	02	04	06
Mild	7-17	15	28	43
Moderate	18-23	09	10	19
Severe	≥24	04	08	12

Table 3: Hamilton Anxiety Rating Scale Grading

Grading	Score	Male	Female	Total
Normal	≤06	04	08	12
Mild	7-17	14	24	38
Moderate	18-23	08	11	19
Severe	≥24	04	07	11

Table 4: Distribution of HDRS symptoms and their comparison between males and females

HDRS Category	Male	Female
Depressed Mood	24	28
Feeling of Guilt	06	08
Suicide	04	17
Insomnia	22	22
Activity level ↓	17	27
Anxiety	16	39
Gastrointestinal somatic symptoms	21	32
Weight loss	13	27
Sexual issues	15	30

Table 5: Distribution of HAM-A symptoms and their comparison between males and females

HAM-A Category	Male	Female
Anxity	12	42
Tension	10	30
Fear	10	28
Lack of Sleep	13	31
Low Mood	20	29
Somatic (Muscular)	16	36
Somatic (Sensory)	5	33
Respiratory problems	8	11
Autonomic problems	10	16

DISCUSSION

The sociodemographic profile of participants in our study provides critical insights regarding the interactions between hypothyroidism, anxiety, and depressive symptoms in a specifically defined population. The majority of participants were aged 26–35 years, predominantly married, with school-level education as the most

common academic qualification. This demographic distribution is consistent with existing literature indicating that younger adults, particularly in their late twenties to mid-thirties, are notably impacted by the interplay between thyroid dysfunction and mental health disorders (11, 12).

Table 1 shows that gender ratios reflect a higher prevalence of anxiety and depressive symptoms in females, which is corroborated by current evidence. Research has illustrated that women are often more affected by thyroid-related anxiety and depression than men, attributed to hormonal fluctuations inherent in female physiology (13). Furthermore, Howell et al. affirm that psychosocial determinants contribute to these observed disparities, such as postpartum thyroiditis leading to anxiety and depression postpartum (14).

Upon examining anxiety symptoms through the Hamilton Anxiety Rating Scale (HAM-A), detailed in Table 3, our study reveals a concerning prevalence of moderate to severe anxiety across both male and female participants. This aligns with findings by Guidotti et al., which indicated that patients with hypothyroidism exhibit significantly elevated anxiety scores (15). Additionally, Zheng et al. emphasized the link between somatic anxiety symptoms and thyroid dysfunction, suggesting that untreated thyroid conditions lead to increased anxiety levels requiring clinical attention (12).

Regarding depressive symptoms assessed using the Hamilton Depression Rating Scale (HDRS) in Table 2, a substantial proportion of participants scored within the moderate to severe depression categories. These findings reflect research from Khalid et al., which noted increased rates of depression among hypothyroid patients (14). Moreover, Petkus et al. support our findings, stating that cognitive disturbances from hypothyroidism exacerbate depressive symptoms, underscoring the need for integrated screening protocols in clinical settings (16, 17).

Finally, the comparative analysis of symptom distribution between males and females in Tables 4 and 5 highlights gender-specific vulnerabilities. The pronounced somatic symptoms in females are consistent with findings from Yang et al., who reported higher instances of somatic anxiety and depressive symptoms among females in similar age demographics (18). This necessitates a more nuanced understanding of gender roles in the expression of psychological symptoms related to thyroid dysfunction, advocating for tailored therapeutic approaches in clinical practice.

In summary, our findings reveal a complex interplay between hypothyroidism, anxiety, and depressive symptoms, emphasizing the need for heightened awareness and integrative management approaches, particularly in the context of the young, married Pakistani population. This aligns with existing literature advocating for comprehensive mental health screenings in patients with thyroid dysfunction, underscoring the necessity of concurrently addressing mental health alongside endocrinological health for improved patient outcomes (19, 20).

CONCLUSION

Thyroid hormones (THs) play a crucial role in influencing mood, behavior, and cognition, establishing a significant connection between psychiatric disorders and thyroid status. The interplay between thyroid dysfunctions and psychiatric comorbidities, including depressive disorders, anxiety disorders, and disruptions in memory and learning, is a notable concern. Individuals with those signs and symptoms warrant collaborative monitoring and treatment by an endocrinologist, as well as a psychiatrist, working in tandem to develop their treatment plan. Early identification of an endocrine condition is crucial, as it not only helps minimize psychiatric morbidity but also contributes to overall health improvement.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTION

SAJID RAZAQ (Fellow)
Conception Of Study, Data Collection, Development of Research Methodology Design, Study Design, Review of Manuscript, And Final Approval Of Manuscript.
KAMRAN MANAN (Fellow)
Critical input, Study Design, Final Approval of Draft.
MUHAMMAD SAMI (Fellow)
Critical Input, and Review of Literature
WAQAR KABIR (Fellow)
Critical Input, and Review of Literature
UZMA KOKAB (Resident)
Critical Input, and Review of Literature

REFERENCES

1. Dubniewicz E, Majewska P, Staszek A, Łoskot W, Szwech J, Matczak M, et al. The association between hypothyroidism and mental health: a literature review. J Educ Health Sport. 2025;79:57866. https://doi.org/10.12775/jehs.2025.79.57866
2. Gacek M, Wójtowicz A, Kędzior J. Pro-health behaviours and depressive symptoms as well as satisfaction with and quality of life among women with Hashimoto's disease. Eur J Investig Health Psychol Educ. 2025;15(6):97. https://doi.org/10.3390/ejihpe15060097
3. Liu Y, Brent G. The role of thyroid hormone in neuronal protection. Compr Physiol. 2021;11(3):2075-95. https://doi.org/10.1002/cphy.c200019
4. Basiura K, Starzomska D, Rymaszewska K, Puchała J, Gajdzińska N, Rostkowska W, et al. The association between hypothyroidism, mental disorders and physical activity: a comprehensive review. Qual Sport. 2024;16:52499. https://doi.org/10.12775/qs.2024.16.52499
5. Hemmatabadi M, Soran N, Esfahanian F, Sharafi E, Qorbani M, Shirza N. Comparison of mental health and quality of life in euthyroid patients under levothyroxine monotherapy based on the causes of hypothyroidism. Turk J Endocrinol Metab. 2021;25(3):288-94. https://doi.org/10.25179/tjem.2021-83124
6. Brizuela N, Valenzuela-Peraza A, Daniel S, García-Martínez Y, Pacheco-Rosado J, Pérez-Sánchez G, et al. Is the acquired hypothyroidism a risk factor for developing psychiatric disorders? Front Psychiatry. 2024;15:1429255. https://doi.org/10.3389/fpsyt.2024.1429255
7. Bablis P, Day R, Bablis S, Pollard H. Treatment of hypothyroidism and stress using neuro-emotional technique (NET): a case study. Cureus. 2024;16(7):e58231. https://doi.org/10.7759/cureus.58231

8. Prevalence and associated factors of depressive symptoms among adults with overt hypothyroidism on treatment in Riyadh: a cross-sectional study. Int J Psychiatry. 2019;4(1):5. https://doi.org/10.33140/ijp.04.01.5
9. Fanaei S, Amouzegar A, Cheraghi L, Mehrabi F, Amiri P. The emotional states and health-related quality of life in patients with thyroid dysfunction: a cross-sectional study. Res Square. 2022. https://doi.org/10.21203/rs.3.rs-1371783/v1
10. Alrudian N, Parameaswari P, Alqahtani R, Khawaja R, Alreesh S, Alkraidis Y, et al. Quality of life in outpatient primary hypothyroidism in Riyadh. Pak J Med Health Sci. 2022;16(7):839-42. https://doi.org/10.53350/pjmhs22167839
11. Zhao T, Chen B, Zhao X, Shan Z. Subclinical hypothyroidism and depression: a meta-analysis. Transl Psychiatry. 2018;8(1):201. https://doi.org/10.1038/s41398-018-0283-7
12. Fan T, Luo X, Li X, Shen Y, Zhou J. The association between depression, anxiety, and thyroid disease: a UK Biobank prospective cohort study. Depress Anxiety. 2024;2024(1):8000359. https://doi.org/10.1155/2024/8000359
13. Felek D, Duman G. Quality of life of patients with postoperative hypothyroid and Hashimoto thyroiditis. Cumhuriyet Med J. 2023;45(1):100-6. https://doi.org/10.7197/cmj.1209398
14. Khalid U, Kalra S, Sarwar S, Hashim H, Ghaffar T, Zoak Z, et al. Depression illness in patients with primary hypothyroidism presenting to endocrine clinic. Pak J Med Health Sci. 2021;17(3):406-8. https://doi.org/10.53350/pjmhs2023173406
15. Guidotti S, Innocenti A, Cosentino C, Monzani F, Guccini I, Pruneti C. Increased psychological symptoms and autonomic arousal in patients with subclinical hypothyroidism: a case–control study. Endocrines. 2024;5(2):186-96. https://doi.org/10.3390/endocrines5020013
16. Petkus A, Filoteo J, Schiehser D, Gomez M, Petzinger G. Worse cognitive performance predicts increased anxiety and depressive symptoms in patients with Parkinson's disease: a bidirectional analysis. Neuropsychology. 2019;33(1):35-46. https://doi.org/10.1037/neu0000498
17. Romero-Gómez B, Guerrero-Alonso P, Carmona-Torres J, Notario-Pacheco B, Cobo-Cuenca A. Mood disorders in levothyroxine-treated hypothyroid women. Int J Environ Res Public Health. 2019;16(23):4776. https://doi.org/10.3390/ijerph16234776
18. Yang R, Du X, Li Z, Zhao X, Lyu X, Ye G, et al. Association of subclinical hypothyroidism with anxiety symptom in young first-episode and drug-naïve patients with major depressive disorder. Front Psychiatry. 2022;13:920723. https://doi.org/10.3389/fpsyt.2022.920723
19. Güneş N. Evaluation of anxiety and depression in patients with thyroid function disorder. Rev Assoc Med Bras. 2020;66(7):979-85. https://doi.org/10.1590/1806-9282.66.7.979
20. Kotkowska Z, Strzelecki D. Depression and autoimmune hypothyroidism—their relationship and the effects of treating psychiatric and thyroid disorders on changes in clinical and biochemical parameters including BDNF and other cytokines—a systematic review. Pharmaceuticals. 2022;15(4):391. https://doi.org/10.3390/ph15040391