Prevalence of Anxiety and Depression in Chronic Neurological Disorders Using the (HADS) in Jeddah, Saudi Arabia

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Abstract

In this research, we screened for undiagnosed depression and anxiety in patients with chronic neurological diseases at the neurology outpatient clinic at King Abdulaziz University Hospital. A cross-sectional study was conducted Between January and July 2023. Using The Hospital Anxiety and Depression Scale (HADS) questionnaire. We excluded all patients with undiagnosed neurological disease and patients who have been previously diagnosed with anxiety and depression. In total 121 patients participated in our study. The mean age of the patients in the study was 33.58 (±SD 11.02. Most of which had no other comorbidities 95 (78.5%). The most common comorbidity found in 12 (9.9%) of the patients was Diabetes mellitus. Followed by Hypertension with 6 patients (3.9%). Epilepsy had the highest prevalence out of chronic neurological diseases with 50 patients (41.3%). Subsequently, multiple sclerosis had a high percentage of 42 (34.7%). The majority of patients had a normal depression score of 77 (63.6%). A significant number of patients had a borderline depression score (32 patients, 26.4%) and 12 patients (9.9%) had abnormal scores. Regarding anxiety scores, 59 patients (48.8%) had scores within the normal range, whereas 21 patients (17.4%) had a borderline score and 41 (33%) exhibited abnormal anxiety scores. Demonstrating a strong correlation between anxiety scores and chronic neurological diseases (P=0.033). According to our study, there is a significant relationship between anxiety and chronic neurological diseases, in contrast, no significant relationship between depression and chronic neurological diseases.

Keywords: Neurological diseases, Anxiety, Depression, Saudi Arabia

INTRODUCTION

Psychological issues such as anxiety and depression affect people all around the world. 301 million people have anxiety, and 280 million suffer from depression, as stated by the World Health Organization [1]. Anxiety and Depression may arise in patients with chronic neurological disorders from dealing with chronic and disabling diseases or psychosocial factors, such as insufficient coping mechanisms, missing social support, and the effects of chronic neurological disease on their daily activities. A study conducted in the United Kingdom found that 54.1% of 4178 participants with multiple sclerosis experienced anxiety, with most being female, meanwhile, 46.9% had depression, with most being male [2]. Louter *et al*. found that mood disorders and anxiety are common psychiatric comorbidities in patients with migraine, and they crucially affect disease prevalence, prognosis, treatment, and clinical outcomes [3]. Similarly, Minen *et al*. found that mood disorders and anxiety are 2-10 times more common in individuals with migraine than in the general population [4]. A different study involving 600 patients with migraine found that 50% of the patients experienced anxiety and 20% experienced depression [5]. Rai *et al*. found that anxiety and depression are extremely common in individuals with epilepsy, showing approximately one-third of the

individuals meeting the diagnostic criteria for said disorders at some point in their lives [6]. Similarly, Gandy *et al*. found that individuals with epilepsy are more susceptible to developing anxiety and depression than healthy controls or individuals with other medical conditions [7]. A study involving 349 individuals with epilepsy found that 48% experienced anxiety and 51% experienced depression [8]. Fiedorowiez *et al*. found that individuals often experience post-stroke depression and post-stroke anxiety after suffering from a stroke [9], similarly, Robinson and Spalletta and

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Burton *et al*. found that about 25% to 30% of stroke survivors experience post-stroke anxiety [10, 11].

Our study focuses on determining the prevalence of depression and anxiety among people with chronic neurologic disorders **(Table 1)**. In this study, we found that the majority of the patients with chronic neurological disorders have undiagnosed anxiety or depression, which raises the need to establish new interventions to improve the well-being of patients with chronic neurological disorders in Saudi Arabia.

MATERIALS AND METHODS

Study Design and Population

This cross-sectional study determined the prevalence of depression and anxiety among patients with chronic neurological disorders. The study population comprised patients aged 18 or older who could provide verbal consent and were diagnosed with a chronic neurological disorder at the King Abdulaziz University Hospital. Patients with terminal chronic diseases, psychiatric disorders, and those who had been previously diagnosed with anxiety and depression and received treatment for it were excluded. A total of 152 patients responded to our questionnaire, and among them, 121 met the inclusion criteria and were included in the study.

Data Collection

Data were collected from patients attending neurological clinics in King Abdulaziz University Hospital between January and July 2023. We collected participants' sociodemographic data, which are age and sex using a Google Form questionnaire. We also gathered information on chronic diseases they were diagnosed with, such as diabetes, hypertension, and heart disease, and whether they had been previously diagnosed with psychiatric disorders. Furthermore, we collected information on the neurological disorder they were diagnosed with. Participants' depression and anxiety levels were measured using the Hospital Anxiety and Depression Scale (HADS)

Hospital Anxiety and Depression Scale

The HADS is widely used to predict and diagnose anxiety and depression in hospital settings. We used a validated Arabic version of the HADS [12]. The questionnaire contains 14 items: seven items each for measuring anxiety and depression. All items are rated from 0 to 3. Although items measuring anxiety and depression are interspersed in the scale, they are scored separately. A score of 0-7 was considered normal, 8-10 denoted a borderline case, and 11-21 was considered abnormal and a case of anxiety or depression.

Data Entry and Analysis

The data were entered using Google Forms. Descriptive statistics were used to summarize the data. A univariate analysis was performed using frequency charts and a bivariate analysis using a chi-square test. The incidence was calculated as a percentage with a 95% confidence interval. All analyses were performed using Statistical Package for Social Sciences (version 21; Armonk, NY: IBM Corp). Statistical significance was set at $P < 0.05$.

RESULTS AND DISCUSSION

The male-to-female ratio among the participants was approximately 1:2 **(Figure 1)**. There were 108 (89.3%) Saudi and 13 (10.7%) non-Saudi patients. Participants' mean age was 33.58 ($\pm$ SD = 11.02). The highest number of participants (n = 51, 42.14%) were in the 31-50 age range, followed by those in the 18-30 (n = 49, 40.49%) and those older than 50 (n = 21, 17.35%). Although most participants had no comorbidity (n = 95, 78.5%), Diabetes mellitus was found (n = 12, 9.9%), followed by hypertension (n = 6, 3.9%).
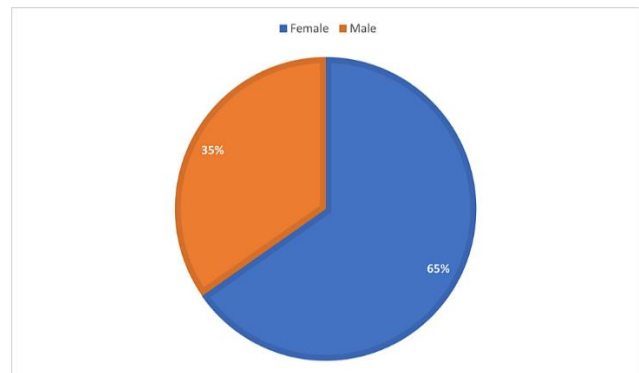

Figure 1. Percentage of male and female participants

Table 1 shows that the most common neurological disorder was epilepsy (n = 50, 41.3%), followed by multiple sclerosis (n = 42, 34.7%).

Table 1. Frequency of neurology disorder

	Neurological disorders	
	Frequency	**%**
Epilepsy	50	41.3
Multiple sclerosis	42	34.7
Migraine	13	10.7
Stroke	8	6.6
Cluster headache	4	3.3
Peripheral neuropathy	3	2.5
Optic neuritis	1	0.8

Regarding the assessment of depression, most (n = 77, 63.6%) had a normal score, many (n = 32, 26.4%) had a borderline score, and few had an abnormal score (n = 12, 9.9%). Regarding the assessment of anxiety, most participants had a normal score (n = 59, 48.8%), followed by

an abnormal score (n = 41, 33%) and a borderline score (n = 21, 17.4%).

Table 2. Scores for anxiety based on neurological disorder

Neurological disorder and score for anxiety				
Neurological disorder		**Score for anxiety**		
		Normal	**Borderline (borderline case of anxiety)**	**Abnormal (case of anxiety)**
Multiple sclerosis	Count	24	8	10
	% of Total	19.8%	6.6%	8.3%
Migraine	Count	4	5	4
	% of Total	3.3%	4.1%	3.3%
Cluster headache	Count	0	0	4
	% of Total	0.0%	0.0%	3.3%
Epilepsy	Count	22	8	20
	% of Total	18.2%	6.6%	16.5%
Stroke	Count	7	0	1
	% of Total	5.8%	0.0%	0.8%
Peripheral neuropathy	Count	2	0	1
	% of Total	1.7%	0.0%	0.8%
Optic neuritis	Count	0	0	1
	% of Total	0.0%	0.0%	0.8%

There was a statistically significant relationship between neurological disorders and scores for anxiety (P = 0.033), and all participants with cluster headaches (n= 4, 3.3%) and Optic neuritis (n= 1, 0.8%) had an abnormal score for anxiety (**Table 2**).

Regarding participants' sex and scores for anxiety, females (n = 29, 24%) had more abnormal scores for anxiety than males (n = 12, 9.9%) (**Figure 2**). Furthermore, a significant relationship was found between sex and the score for anxiety (P = 0.023).
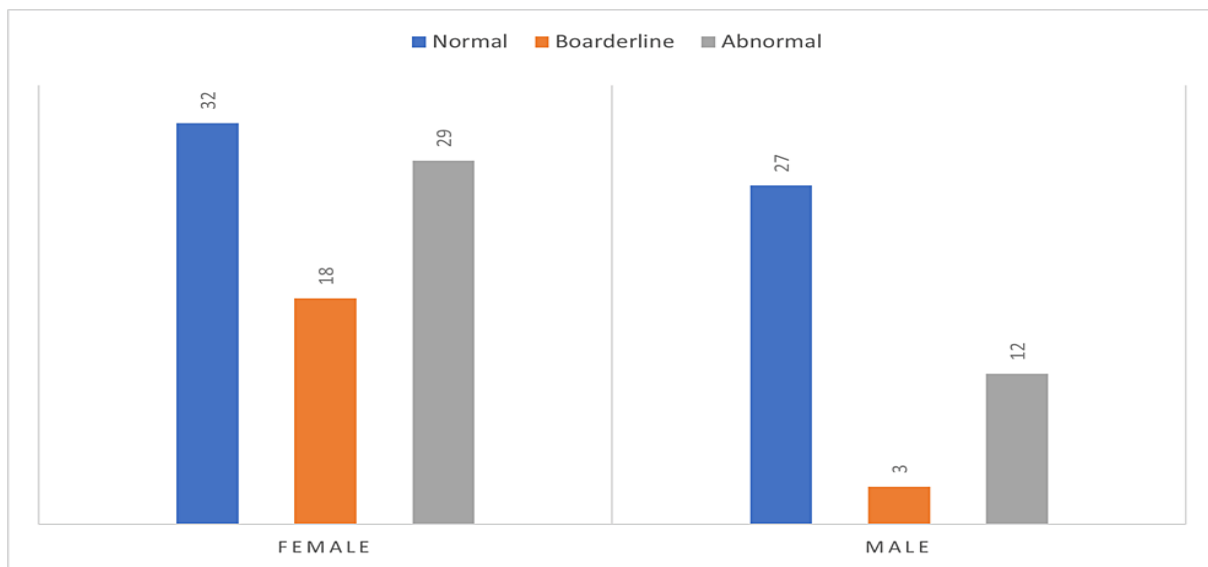

Figure 2. Scores for anxiety based on sex

No significant relationship was found between neurological disorders and scores for depression (P = 0.357). Moreover, most participants had normal scores for depression (n= 31, 25.6%) of Multiple sclerosis patients were normal score for depression (**Table 3**).

Table 3. Neurological disorder and score for depression

Neurological disorder		Score for depression		
		Normal	Borderline (borderline case of depression)	Abnormal (case of depression)
Multiple Sclerosis	Count	31	9	2
	% of Total	25.6%	7.4%	1.7%
Migraine	Count	10	2	1
	% of Total	8.3%	1.7%	0.8%
Cluster headache	Count	2	1	1
	% of Total	1.7%	0.8%	0.8%
Epilepsy	Count	28	17	5
	% of Total	23.1%	14.0%	4.1%
Stroke	Count	5	1	2
	% of Total	4.1%	0.8%	1.7%
Peripheral neuropathy	Count	1	1	1
	% of Total	0.8%	0.8%	0.8%
Optic neuritis	Count	0	1	0
	% of Total	0.0%	0.8%	0.0%

As for participants' sex and scores for depression, eight females (6.6%) and four males (3.3%) had an abnormal score (**Figure 3**). Furthermore, no significant relationship was found between sex and the score for depression (P = 0.992).
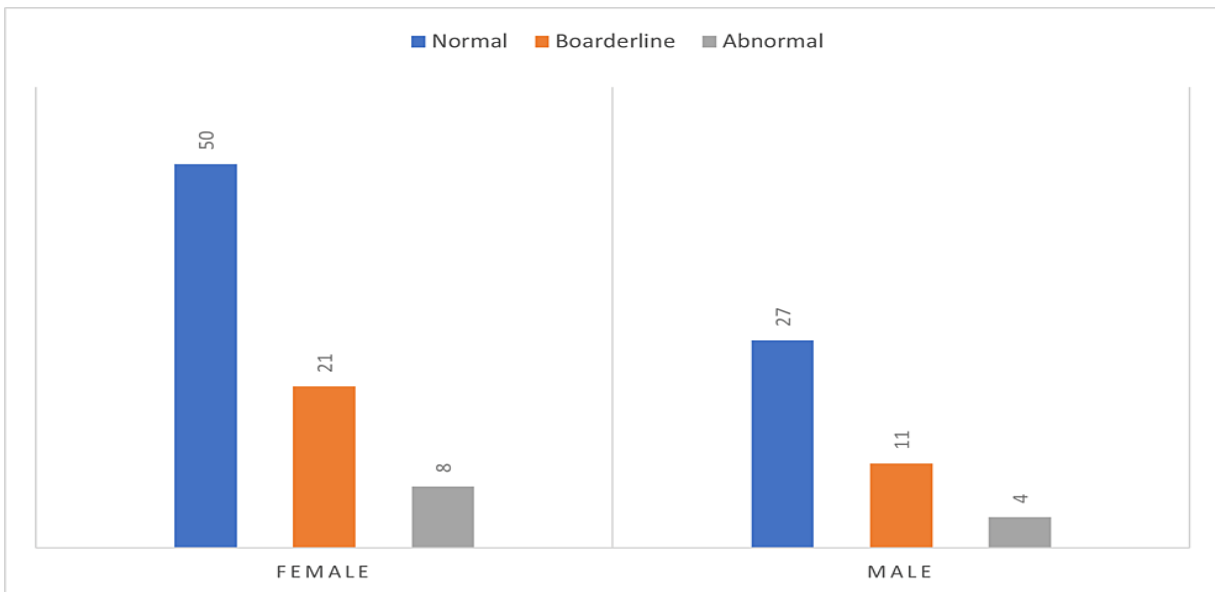

Figure 3. Scores for depression based on sex

The findings of this study align with those of previous studies. A study in Saudi Arabia [13] measured the psychological and physical aspects of patients who experienced stroke. It found that approximately 32% of the patients male had anxiety triggered by their neurological insults.

The prevalence of anxiety among individuals with migraine has differed significantly across countries. A Korean study found that 10.0% of patients with migraine suffered from anxiety [14]. In contrast, a population-based study in France reported that 46.8% of patients with migraine experienced anxiety. In this study, the percentage was closer to the France-based study: 30.8% of the participants with migraine had an abnormal score for anxiety. We believe that anxiety cases are rising among individuals with migraine because they are fearful of losing their social interests and professional lives due to the symptoms associated with the disorder [15].

A study in North America targeted patients with multiple sclerosis and conducted several diagnostic tests for psychiatric illnesses. Among 237 patients, 14% met the requirements for the diagnosis of generalized anxiety disorder [2]. A study in Riyadh conducted in two neuroimmunology outpatient departments in the middle of the capital city found that nearly a quarter of the patients with multiple sclerosis (25.7%) had anxiety [16].

Regarding epilepsy, a study in 2016 involving 1041 patients with epilepsy found that 55.3% of the patients suffered from anxiety based on the HADS. A strength of that study is that it was among the first to use the HADS among patients with epilepsy [6]. Unfortunately, we did not find any previous study that used the HADS and determined the prevalence of anxiety among patients with cluster headaches.

In this study, out of 42 patients with multiple sclerosis, only two had an abnormal score and nine had a borderline score for depression. These numbers are significantly lower than those reported in a study conducted in the United Kingdom [2]. That study found a clear relationship between having multiple sclerosis and depression, with almost 47% of the patients scoring eight or more on the HADS.

As for patients with epilepsy, 21 patients had an abnormal or borderline score in this study, this number being relatively higher than that among patients with multiple sclerosis. The finding that the incidence of depressive symptoms is higher among patients with epilepsy corresponds to that of a study conducted in the United Kingdom [8], which found an increased prevalence of depression in patients with epilepsy, especially drug-resistant epilepsy.

A study in France [15] used the HADS among patients with migraine and found that 3.5% of the patients suffered from depression and 19.1% suffered from both anxiety and depression in comparison with the normal population. Moreover, it recommended that depression should be systemically looked for and cared for in individuals who consult doctors for migraine, in our study, the percentage was 7.7% of the participants with migraine had an abnormal score for depression. We see that it is significant enough for depression to be systemically reviewed in Saudi Arabia.

Robinson and Spalletta [10] found that the overall prevalence of major depression is 21.7% among patients who had experienced a stroke. Moreover, the strongest single correlate of depression was the severity of impairment in activities of daily living. In this study, three patients had an abnormal or borderline score out of eight patients (37%), thus supporting the results of Robinson and Spalletta [10].

A study in Tunisia [9] found that the prevalence of depression is 65.6% among patients with peripheral neuropathy. The depression score was significantly and positively associated with pain intensity. Furthermore, individuals with depression had a poor quality of life according to the 12-Item Short Form Survey and Brief Pain Inventory. In this study, only one patient with peripheral neuropathy had an abnormal score for depression. Therefore, future studies should investigate the relationship between neuropathic pain and depression in Saudi Arabia.

We found a significant relationship between anxiety and sex, with females with common neurological disorders being more likely to develop anxiety than their male counterparts, as shown in **Figure 2**. This result is consistent with that of Jones *et al*. [2], who found that 54% of patients with multiple sclerosis had anxiety, and most were females. However, in the studies of Peres *et al*. and Devlen, most participants were female, but no relationship was found between anxiety and sex [5, 17]. Many studies have shown that the prevalence rates of anxiety disorders are higher among women. For instance, McLean *et al*. [18] found that the male-to-female ratio of the lifetime prevalence of any anxiety disorder is 1:1.7, and anxiety is more disabling in women than in men.

Our study found no significant relationship between depression and sex. Many studies have shown that females are more likely to develop depression than males. For example, Qin *et al*. conducted a meta-analysis on the prevalence of depression in patients with epilepsy and found it to be 27%. They also found that 20 studies reported that being female is a risk factor for depression [19]. To determine why this study did not find a significant relationship between depression and sex, a study conducted for a longer period with a larger sample size should be conducted, taking into consideration other social factors. Females are not only more likely to develop depression, but the disorder's impact among them is also greater than that among males. Buse *et al*. [20] assessed the impact of headaches on the lives of individuals with migraine using the Headache Impact Test-6 and found that females experience more adverse headaches than males.

Limitations
One major limitation of our study is the relatively small sample size. Another notable limitation was disregarding the

duration of chronic neurological disorders in each patient which could have an impact on their mental status. Additionally, the patient's ability to access the health care system for follow-up care related to their chronic neurological disorders is an important limitation, as it may have an impact on the patient's chronic neurological condition subsequently impacting their mental well-being. For future research, we recommend conducting more extensive sample sizes and taking into consideration the duration of chronic neurological disorders.

CONCLUSION

This study explores the frequency of undiagnosed depression and anxiety among patients with chronic neurological disorders in Saudi Arabia. According to our study, we found a significant relationship between chronic neurological disorders and anxiety, with almost half of the participants having abnormal or borderline scores for anxiety. Regarding depression and chronic neurological disorders, there is no significant relationship, with more than half of the patients having a normal score, despite that, it is important to note that 36% of the patients had abnormal or borderline scores. Therefore, routine screening for anxiety and depression deserves to be implemented by physicians among individuals diagnosed with chronic neurological disorders. As it may help identify undiagnosed cases earlier for better intervention and treatment.

ETHICS STATEMENT: Before data collection, ethical approval was obtained from the Faculty of Medicine Research Ethics Committee of King Abdulaziz University Hospital (126-23). Verbal consent was obtained from the participants before the questionnaire was administered. Their privacy and confidentiality were protected.

Written informed consent was obtained from all individual participants included in the study.

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