



Headache and mental disorders in practice

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Introduction

Migraine is a major cause of global functional disability and is frequently associated with psychiatric disorders such as anxiety and depression. Although the literature highlights this association, few studies have explored these relationships in real-life contexts, outside controlled clinical environments.

Objective

To analyze the relationship between anxiety and depression levels and the impact of headache on the quality of life of patients with migraine in a real-life context.

Methods

A prospective longitudinal observational study was conducted between January and December 2024, involving 46 patients treated at a tertiary headache center. Data were collected using the REBRACEF questionnaire. Statistical analyses included correlation tests and comparisons between the MIDAS, PHQ-9, and GAD-7 scales, as well as the variables sex and age.

Results

The majority of participants were female (87%), with a mean age of 44.5 years. A significant negative correlation was found between age and MIDAS score ($p=0.036$), suggesting greater functional impact in younger patients. No significant correlation was found between MIDAS and PHQ-9 or GAD-7 scores. However, a positive correlation was observed between PHQ-9 and GAD-7 scores ($p<0.001$), indicating comorbidity between depression and anxiety.

Conclusion

The findings suggest that younger patients experience greater functional impairment due to migraine. Despite the high prevalence of anxiety and depression symptoms, these comorbidities did not show a direct association with the functional impact of pain. The results underscore the importance of multidimensional approaches and highlight the need for studies with larger samples and longitudinal designs.

Keywords:

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Introduction

Migraine is one of the most frequently reported complaints in medical practice and, according to the World Health Organization (WHO), it corresponds to the second leading cause of global disability (1). This condition affects approximately 15.3% of the Brazilian population and has several impacts on affected individuals, including reduced functional capacity, limited work performance, and decreased quality of life (2–5).

In addition to the functional impairment caused by migraine, this clinical condition is often associated with psychiatric comorbidities, such as anxiety and depression, which also have a significant impact on the quality of life of affected individuals. Mood disorders, in addition to being highly prevalent in the general population, are up to 10 times more common in patients with migraine, highlighting the relevance of this association for the clinical management of the disease (4,6,7).

The relationship between migraine and mood disorders is widely documented in the literature and is bidirectional (8). Studies indicate that individuals with migraine are more predisposed to developing psychiatric disorders, possibly due to shared genetic and neurobiological mechanisms, such as serotonin transporter gene polymorphism, serotonergic and dopaminergic neurotransmission dysfunctions, and hypothalamic-pituitary-adrenal axis dysregulation (4,8). On the other hand, anxiety and depression can intensify pain perception, reduce tolerance to headache episodes, and increase the frequency and severity of attacks, making clinical management of migraine difficult. In addition, the functional impact and limitations caused by recurrent pain can aggravate depressive and anxiety symptoms, creating a vicious cycle that further compromises patients' quality of life (5).

Although the relationship between migraine and mood disorders is widely documented, most studies are conducted in controlled clinical settings, which often hinders them from fully reflecting patients' everyday experiences. In addition, there are still gaps in our understanding of how these factors interact in order to impact the quality of life in a real context, in which multiple variables, such as lifestyle, socioeconomic status, comorbidities, and access to treatment, can influence this relationship.

Thus, this study aims to analyze the relationship between anxiety and depression levels and the impact of headache on the quality of life of migraine patients in a real-life context, allowing for a closer analysis of these individuals' reality and contributing to the improvement of clinical management strategies.

Methods

This was a prospective longitudinal observational study conducted between January and December 2024. Prospective data were collected in the form of questionnaires completed by participants and medical staff and in the form of headache diaries, called the Brazilian Headache Registry (REBRACEF) (9). The REBRACEF is a system that uses the observational method to collect patient data in a standardized manner. One of its objectives is to study the natural history of the disease in question; determine the effectiveness and safety of one or more treatments; and study the effect of specific conditions, such as pregnancy and comorbidities. Participants were recruited at the MD Paolucci Multiprofessional Academic Center (CAM FAME) specialized in treating headaches in the region.

All patients aged 18 or over, who sought treatment for headaches at this tertiary center, and who agreed to participate in the study, were considered eligible. The exclusion criterion was the presence of cognitive limitations regarding understanding the informed consent statement and/or completing the structured questionnaire.

The study protocol was approved by the research ethics committee of (Barbacena School of Medicine). The initial interview was conducted after obtaining the patient's informed consent, immediately after a consultation at a specialized outpatient clinic or through an interview.

Forty-six patients who completed the entire REBRACEF questionnaire were evaluated. The initial questionnaire contained 138 questions divided into modules: Identification data, with 10 questions; Sociodemographic data, with 8 questions; Anthropometric data, with 2 questions; Lifestyle habits, with 7 questions; Headache, with 36 questions; Impact of headache, with 13 questions; Quality of life, with 8 questions; Quality of life and Comorbidities, but the remaining questions were developed by the researchers.

In this study, we analyzed the relationship between anxiety and depression levels and the impact of headache on the quality of life of migraine patients by analyzing the responses in the module Migraine Disability Assessment Scale (MIDAS) and of the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7).

The impact was assessed using Migraine Disability Assessment Scale (MIDAS) because, although this scale is more sensitive for screening disability among migraine patients, it also makes it possible to assess the impact of other types of headaches (5,10). It consists of five questions about the number of days lost in the last three months, in whole or in part, in relation to three domains: work/school, household tasks, and non-work-related events (family, social, and leisure). Scores range from zero to 276 and are classified as grade I (scores from 0 to 5, representing no or



minimal disability), grade II (6 to 10, mild disability), grade III (11 to 20, moderate disability), and grade IV (greater than or equal to 21, severe disability). The standardized questionnaires used to assess psychiatric comorbidities were the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder-7 (GAD-7). The PHQ-9 is a self-administered questionnaire for screening symptoms of depression presented in the previous two weeks (11) that has been validated for migraine patients (12). Each response, referring to a specific symptom, is scored from 0 (none) to 3 (almost every day). The total score can range from 0 to 27, meaning that the severity of depression is classified as follows: minimal depression (scores from 0 to 4), mild depression (5 to 9), moderate depression (10 to 14), moderately severe depression (15 to 19), and severe depression (20 to 27).

The impact of depressive symptoms is assessed in a final question, in which performing daily activities is classified as no difficulty, some difficulty, very difficult, and extremely difficult. Anxiety symptoms in the previous two weeks were assessed using GAD-7, which is a self-administered scale that has also been validated for migraine patients. Each of the seven responses is scored from 0 (none) to 3 (almost every day) (13).

Continuous variables were expressed as mean and standard deviation or median and interquartile range (IQR) when nonparametric. Correlations between continuous variables were calculated using Kendall's Tau-b method, and differences in distribution between continuous variables according to MIDAS, PHQ9, and GAD7 were verified using the Mann-Whitney U test. All tests were performed using SPSS Statistics software version 26.0. A critical p-value of 0.05 was used to reject the null hypothesis.

Results

The sample consisted of 46 individuals aged between 17 and 78 years old, with a mean age of 44.5 ± 15.6 years. The population consisted mainly of females, who represented 87% of the total sample (Table 1).

Table 1. Sample Description

	n	Average	SD
Age	46	44.5	15.6
Sex			
female	40 (87%)		
male	6 (6%)		
MIDAS	46	15.0*	34.0*
PHQ9	46	9.7	6.1
GAD7	46	9.4	5.7

*Median and Interquartile Range

Statistical Modeling

When comparing scores on the MIDAS, PHQ-9, and GAD7 scales according to sex, no significant differences were observed in the results obtained between male and female patients ($p=0.534$; 0.070 and 0.087, respectively).

Age correlated significantly with the MIDAS scale score, with lower scores on this scale as age increased ($\tau\text{-}b -0.22$, $p=0.036$). There were no significant correlations between the MIDAS scale score and other variables.

The scores on the GAD-7 and PHQ-9 scales were found to be significantly correlated in a direct manner ($\tau\text{-}b 0.391$, $p<0.001$). The summary of correlations is described in Table 2.

Table 2. Correlation Matrix

	Age	MIDAS	PHQ9	GAD7
Age				
Tau-b	1.000	-0.221	0.085	-0.042
P	.	0.036	0.419	0.690
n	46	46	46	46
MIDAS				
Tau-b	-0.221	1.000	0.087	-0.024
P	0.036	.	0.416	0.826
n	46	46	46	46
PHQ9				
Tau-b	0.085	0.087	1.000	0.391
P	0.419	0.416	.	<0.001
n	46	46	46	46
GAD7				
Tau-b	-0.042	-0.024	0.391	1.000
P	0.690	0.826	<0.001	.
n	46	46	46	46

Discussion

The results of this study show that the impact of migraine on patients' lives, as measured by the MIDAS scale, is significantly associated with age, with younger individuals experiencing greater functional impairment due to headache. This finding is in line with previous findings in the literature, which suggest that young adulthood is a period particularly vulnerable to the functional impact of migraine, since this age group is often involved in more intense academic, professional, and social activities, in which the limitations caused by pain can lead to greater practical and emotional harm (6).

However, contrary to what some studies suggest, no significant correlation was identified between MIDAS scores and PHQ-9 and GAD-7 scores, which assess depressive and anxiety symptoms, respectively. Several hypotheses may explain this discrepancy: the small sample size may have limited the statistical power of the



analysis; the nature of the sample, which came from a specialized tertiary center, may not represent the general population of migraine patients; and contextual factors in patients' daily lives, such as social support, individual coping strategies, and access to health care (7), may have influenced the scores in a heterogeneous manner.

On the other hand, the PHQ-9 and GAD-7 scales showed a strong correlation between them ($p < 0.001$), which reinforces the evidence of comorbidity between depression and anxiety, already well established in the literature (7,8). This interrelationship between mood disorders may represent an additional challenge in the treatment of patients with migraine, although in this study it was not possible to demonstrate that these comorbidities directly influence the functional severity of headache.

No statistically significant differences were found between the sexes in terms of scores on the scales used. Although the literature suggests a higher prevalence of migraine and greater severity of depressive and anxiety symptoms in women (4), the findings of the present study do not indicate a functional impact differentiated by gender, which may be related to the small size of the male sample (13%), limiting the comparative analysis.

The limitations of this study include the small number of participants, the cross-sectional design of statistical analysis, and the reliance on self-reported instruments, which may be subject to response bias. Despite these limitations, the data contributes to understanding the nuances between the functional impact of migraine and mood disorders in a real-world setting outside of controlled clinical environments.

Conclusion

As a conclusion to the analysis of the above model, the data suggest that younger individuals tend to suffer a greater impact from migraine in their daily lives. The impact of migraine, as assessed by the MIDAS scale, does not appear to correlate with depressive or anxiety symptoms measured by the PHQ-9 and GAD-7 scales.

The findings highlight the need for a broader understanding of the care of patients living with migraine, incorporating not only pain control but also the emotional and social factors that influence the experience of the disease. Future investigations, with more robust samples and longitudinal designs, may deepen our understanding of how these elements relate over time, contributing to more effective therapeutic strategies that are individualized and integrated into the reality of patients.

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