



MIGRAINE-RELATED DISABILITY AND ITS CORRELATION WITH SELF-EFFICACY, HYPERVIGILANCE AND PAIN CATASTROPHIZING

INCAPACIDADE RELACIONADA À MIGRÂNEA E SUA CORRELAÇÃO COM AUTOEFICÁCIA, HIPERVIGILÂNCIA E CATASTROFIZAÇÃO DA DOR

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ABSTRACT: The objective of this study was to analyze the correlation between disability and the cognitive aspects of pain catastrophizing, hypervigilance, and self-efficacy in individuals with migraine. This was a cross-sectional study involving 88 participants, in which demographic data and study variables were collected using the Brazilian versions of the Pain Vigilance and Awareness Questionnaire, Pain Catastrophizing Scale, Headache Disability Inventory, and Chronic Pain Self-Efficacy Scale. Pain catastrophizing ($r = 0.679$; $p < 0.01$) and hypervigilance ($r = 0.500$; $p < 0.01$) showed a moderate, positive, and significant correlation with disability, whereas self-efficacy ($r = -0.531$; $p < 0.01$) demonstrated a moderate, negative, and significant correlation with disability. It is concluded that higher levels of pain catastrophizing and hypervigilance are associated with greater disability, while higher self-efficacy is associated with lower disability.

KEYWORDS: Hypervigilance. Migraine. Pain catastrophizing. Self-efficacy.

RESUMO: O objetivo foi analisar a correlação entre incapacidade e os aspectos cognitivos de catastrofização da dor, hipervigilância e autoeficácia em indivíduos com migrânea. Estudo transversal envolvendo 88 participantes. Foram coletados dados demográficos e variáveis utilizando as versões brasileiras dos seguintes questionários: Pain Vigilance and Awareness Questionnaire, Pain Catastrophizing Scale, Headache Disability Inventory e Chronic Pain Self-Efficacy Scale. A catastrofização da dor ($r = 0,679$; $p < 0,01$) e a hipervigilância ($r = 0,500$; $p < 0,01$) apresentaram correlação moderada, positiva e significativa com a incapacidade, enquanto a autoeficácia ($r = -0,531$; $p < 0,01$) demonstrou correlação moderada, negativa e significativa com a incapacidade. Conclui-se que maiores índices de catastrofização da dor e hipervigilância estão associados a maior incapacidade, enquanto maior autoeficácia relaciona-se a menor incapacidade.

PALAVRAS-CHAVE: Autoeficácia. Catastrofização da dor. Hipervigilância. Migrânea.

INTRODUCTION

Migraine, also referred to as migraine headache, is a primary headache disorder that affects between 5 and 20% of the global population, with a higher prevalence in women¹. According to the Global Burden of Disease from 2022, this condition is the third most prevalent disorder worldwide and the second leading cause of disability². Despite its high prevalence, migraine remains underdiagnosed and undertreated², resulting in negative impacts on the quality of life of this population. In Brazil, migraine affects approximately 15% of the population and has a prevalence of 14,000 cases per 100,000 inhabitants, according to epidemiological studies^{3, 4}.

Among primary headaches, migraine is recognized as a global concern by the World Health Organization (WHO), emphasizing its disabling potential. In 2022, the WHO incorporated headache management into the Intersectoral Global Action Plan for Neurological Conditions, with guidelines focused on health promotion, primary prevention, healthcare professional training, and access to treatment.⁵ In Brazil, studies indicate that migraine is the second most prevalent non-communicable chronic condition and one of the leading causes of disability among adults, resulting in high direct and indirect costs to the healthcare system. Nevertheless, many Brazilians lack adequate and preventive treatments for this condition^{6, 7}. Taking that into consideration, the 2019 Brasília Declaration, proposed by the Brazilian Headache Society, recommended the inclusion of headaches in the protocols of the Unified Health System (SUS), in addition to incorporating policy actions regarding prevention in headache care, in accordance with WHO guidelines.⁸

The impacts of migraine extend beyond the physical sphere, reaching emotional and cognitive aspects. A multicenter study conducted in Canada, France, Germany, Japan, the United Kingdom, and the United States, involving 14,492 individuals with migraine, identified that 35.5% exhibited moderate symptoms of depression and/or anxiety, while 48.5% presented allodynia. Additionally, a reduction in productivity and a deterioration in quality of life were observed, which reinforces the clinical severity of migraine and the need to investigate cognitive aspects that are still underexplored.^{9, 10} Cognitive dysfunctions have already been identified in the migraine population, such as alterations related to memory, attention, and processing speed.^{11, 12} These findings emphasize the severity of the condition and suggest that a relationship between disability and cognitive-behavioral factors may be explored.

Migraine, in addition to individual suffering, imposes a significant socioeconomic burden, as it predominantly affects young adults between 25 and 55 years of age, a period corresponding to the prime of working life and maximum productive capacity. As a consequence, high rates of absenteeism and presenteeism are observed, impacting professional life and contributing to migraine-related disability.^{2, 3, 13} In this context, disability is defined as the reduction of an individual's functionality, limiting their ability to interact with their environment and perform daily activities, affecting physical, emotional, and behavioral aspects.¹³ Furthermore, this condition is associated with impacts on cognitive functions and may be related to the development of depressive and anxiety disorders.^{14, 15}

In this context, the analysis of cognitive-behavioral aspects, such as pain catastrophizing, hypervigilance, and self-efficacy, is essential for understanding the mechanisms involved in the pain experience and in reducing migraine-related disability. Pain catastrophizing consists of a negative cognitive-affective response that amplifies the perception of pain intensity and reduces coping capacity.^{15, 16, 17} Pain self-efficacy refers to the individual's belief in their ability to manage pain and adapt to the limitations imposed by their clinical condition, being an essential factor for symptom reduction and improvement in quality of life.^{18, 19} Finally, pain hypervigilance, characterized by a constant state of alertness in identifying painful stimuli, is associated with disease chronification and increased disability.²⁰

Given the relevance of these cognitive-behavioral aspects and the gap in the literature regarding the relationship between migraine-related disability, this study aims to analyze the correlation between disability and the cognitive aspects of pain catastrophizing, hypervigilance, and self-efficacy in individuals with migraine.

METHODOLOGY

This is a cross-sectional observational study, conducted in accordance with the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).²¹ The study was carried out at the Learning and Motor Control Laboratory (LACOM) of the Department of Physical Therapy at the Federal University of Pernambuco (UFPE), which specializes in neuromotor rehabilitation and the management of chronic conditions, including headaches. At LACOM, an extension project in physical therapy applied to headaches is developed, from which the volunteers for the present study were screened.

Data collection took place between December 2023 and February 2024. The sample was obtained by convenience, and data were collected at LACOM. In addition, volunteers completed an online form to provide supplementary information. Volunteers were included if they were between 18 and 55 years of age and had a score of ≥ 2 on the ID-Migraine questionnaire, Portuguese version for Brazil, which is a sensitive and specific tool for clinical screening in the identification of individuals with migraine.²² Participants were excluded if they self-reported being pregnant, having uncontrolled arterial hypertension, or having a history of headache that began following a craniocervical trauma within the last 3 months.

Data were collected through a structured form containing sociodemographic information (age and sex) and clinical variables such as pain catastrophizing, self-efficacy, hypervigilance, and headache-related disability. The study was approved by the Human Research Ethics Committee of UFPE, under approval number 6.571.996.

DATA COLLECTION PROCEDURES

ID-MIGRAINE QUESTIONNAIRE

The screening of individuals with migraine was conducted using the Brazilian Portuguese version of the ID-Migraine questionnaire, a validated instrument for the diagnostic screening of individuals with migraine. It is a self-assessment tool composed of three dichotomous (yes/no) questions, with a score of 1 assigned for each positive response. Individuals who achieve a score of ≥ 2 are classified as having migraine. This instrument demonstrates a combined sensitivity of 0.87 (95% CI: 0.85–0.89) and a specificity of 0.75 (95% CI: 0.72–0.78).²²

HEADACHE DISABILITY INVENTORY - BRAZIL

Disability was assessed using the Brazilian version of the Headache Disability Inventory (HDI-Brazil), an instrument designed to evaluate different dimensions related to headache-associated disability and its interference with daily life over the past month. The questionnaire consists of 25 questions divided into three domains: functional, emotional, and social participation. Response options include “yes” (4 points), “sometimes” (2 points), and “no” (0 points).²³ The total score ranges from 0 to 100

points, categorizing individuals from no disability to maximum disability level, with higher scores indicating a greater impact of headache.¹⁹

The questionnaire demonstrates excellent measurement properties, with a Cronbach's alpha internal consistency of 0.84 for the total score, 0.86 for the functional domain, and 0.88 for the emotional domain. Construct validity was confirmed by moderate to strong correlation. It showed an excellent level of test-retest reliability with an intraclass correlation coefficient (ICC = 0.95) and a standard error of measurement (SEM = 2.26), demonstrating high stability and precision in responses over time.²³

CHRONIC PAIN SELF-EFFICACY SCALE

Self-efficacy was assessed using the Brazilian version of the Chronic Pain Self-Efficacy Scale (CPSS), a specific tool for evaluating the perception of self-efficacy and the ability to cope with the consequences of pain in individuals with chronic pain. The scale consists of 22 items divided into three domains: self-efficacy for pain control (AED), self-efficacy for physical function (AEF), and self-efficacy for symptom control (AES).²⁴

The items are assessed using a Likert scale, with scores ranging from 10 to 100, corresponding to the degree of certainty the individual has regarding each item. Each domain has an individual score, and the sum of all domains provides the total score, which ranges from 30 to 300 points. Higher scores indicate a higher level of self-efficacy.²⁴ The CPSS demonstrates good levels of internal consistency, with a Cronbach's alpha of 0.94 for the total score of the 22 items, indicating high reliability for use in clinical and research settings.²⁴

PAIN VIGILANCE AND AWARENESS QUESTIONNAIRE

Hypervigilance was assessed using the Brazilian version of the Pain Vigilance and Awareness Questionnaire (PVAQ). This instrument consists of 16 items that evaluate the individual's behavior related to pain over the past two weeks. Responses are provided on a 6-point Likert scale, ranging from 0 (never) to 5 (always), with total scores ranging from 0 to 80. The score is obtained by summing the responses to each item, with scores ranging from < 1.25 (low vigilance) to ≥ 3.75 (hypervigilance). It is important to note that items 8 (I find it easy to ignore pain) and 16 (I do not dwell on pain) are reverse scored (5 = never and 0 = always).^{25, 26}

The Brazilian version of the PVAQ demonstrates good measurement properties, including construct validity, reliability, and sensitivity. Factor loadings are greater than 0.50, and the fit indices in the confirmatory factor analysis are adequate (CFI = 0.926; GFI = 0.928; RMSEA = 0.083). Internal consistency is high, with Cronbach's alpha > 0.85. Sensitivity was analyzed through descriptive analysis and multivariate normality testing using the Mardia test (Mardia Test = 1.42), which was considered adequate.^{25, 26}

PAIN CATASTROPHIZING SCALE

Catastrophizing was assessed using the Brazilian version of the Pain Catastrophizing Scale (B-PCS), a scale composed of 13 items that evaluate thoughts and feelings related to pain. The instrument is structured into three domains: rumination (items 8–11), magnification (items 6, 7, and 13), and helplessness (items 1–4 and 12). The items are rated on a five-point Likert scale, ranging from 0 (minimum) to 4 (very intense). The total score corresponds to the sum of all items, ranging from 0 to 52 points, with higher scores indicating a greater degree of catastrophizing. The Brazilian version, B-PCS,

demonstrates high reliability, with internal consistency (Cronbach's $\alpha = 0.91$) and intraclass correlation coefficient ($ICC = 0.92$).²⁷ For the present study, the total score was used.

STATISTICAL ANALYSIS

Descriptive analysis of the data was performed using percentage, mean, and standard deviation. The significance level adopted for the present study was 0.05, with a statistical power of 0.80. Data normality was assessed using the Shapiro-Wilk test. Questionnaire scores were analyzed and presented using measures of dispersion and central tendency (mean and standard deviation). Pearson's test was used to analyze the correlations between variables. Correlations were classified as weak ($r < 0.3$), moderate ($0.3 \leq r \leq 0.7$), or strong ($r > 0.7$). Data were tabulated in an Excel spreadsheet and analyzed using JAMOVI software version 2.3.28.0.

RESULTS

A total of 111 volunteers were recruited, of whom 23 (20.7%) were excluded for not meeting the established eligibility criteria. The sample selection process is detailed in Figure 1.

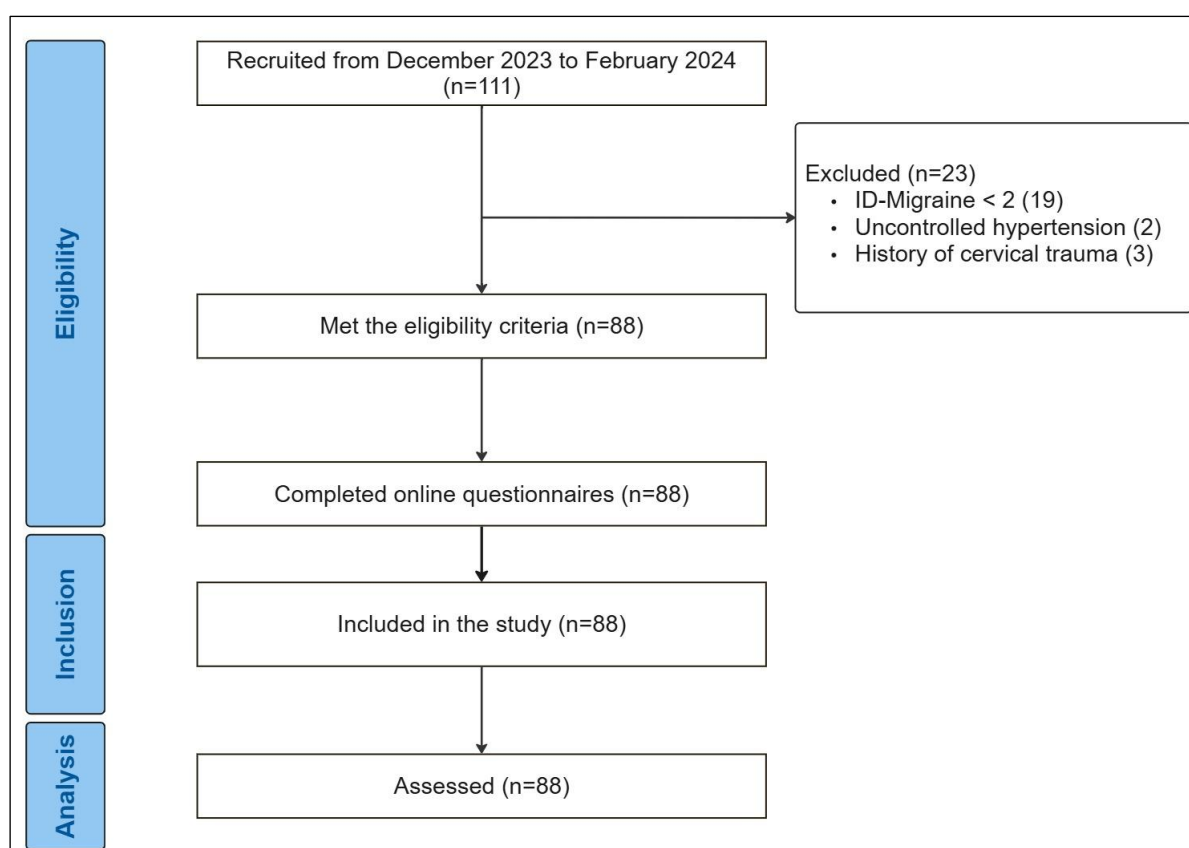


Figure 1. STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) flowchart of volunteer selection.

The study sample consisted of 78 women (89%) and 10 men (11%), with a mean age of 25.9 years (± 9.2). The questionnaire scores were analyzed and are presented in Table 1. The results indicate that participants exhibit moderate disability, while self-efficacy is relatively low, with moderate to high levels of hypervigilance and pain catastrophizing.

Table 1. Descriptive analysis of the sample (n = 88).

Variables	n (%)
Sex; Female	78 (89%)
	MD (± DP)
Age (years)	25,9 (± 9,22)
HDI (score 0-100)	51,5 (± 21,8)
CPSS (score 30-300)	103 (± 55,2)
PVAQ (score ≤ 1,25 between ≥ 3,75)	54,6 (± 13,8)
B-PCS (score 0-52)	28,5 (± 10,9)

MD (± DP): Mean ± Standard Deviation; **CPSS:** Chronic Pain Self-Efficacy Scale; **PVAQ:** Pain Vigilance and Awareness Questionnaire; **HDI:** Headache Disability Inventory; **B-PCS:** Pain Catastrophizing Scale.

The results demonstrate the influence of cognitive-behavioral aspects on migraine-related disability, as presented in Figure 2. A positive and moderate correlation was observed between catastrophizing ($r = 0.679$; $p < 0.01$) and pain hypervigilance ($r = 0.500$; $p < 0.01$) with disability, indicating that participants with higher scores on these variables tend to report greater disability. However, self-efficacy showed a negative and moderate correlation with disability ($r = -0.531$; $p < 0.01$), highlighting an inverse relationship: the lower the reported self-efficacy, the greater the migraine-related disability.

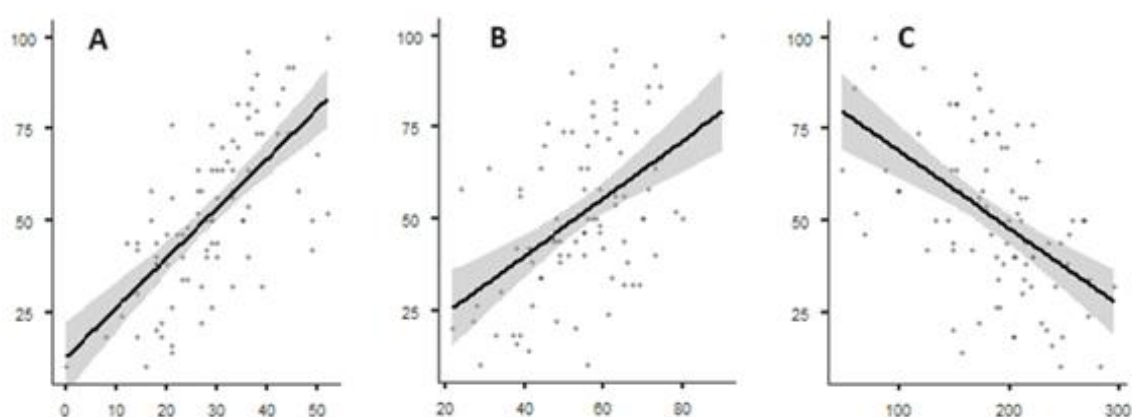


Figure 2. Correlation results among variables. A: Correlation between pain catastrophizing and disability (HDI – Brazil and B-PCS); B: Correlation between disability and hypervigilance (P-VAQ and HDI – Brazil); C: Correlation between disability and self-efficacy (CPSS and HDI – Brazil).

DISCUSSION

This study aimed to analyze migraine-related disability and its correlation with self-efficacy, hypervigilance, and pain catastrophizing. The results demonstrated a positive and moderate correlation for the outcomes of catastrophizing and pain hypervigilance when correlated with disability, while a negative and moderate correlation was observed between self-efficacy and disability.

Migraine is a disorder with multifactorial etiology, involving neurological, neurochemical, and neuroendocrine processes, although there is still no consensus regarding its pathogenesis. It is a permanent condition triggered by factors influenced by environmental and personal elements that are unique to each individual, highlighting the importance of identifying and managing its symptoms. Cognitive-behavioral aspects play a significant role in the patient's pain experience, which is influenced

by factors such as attention to pain, anticipation, emotion, memory of suffering, and the perception of personal efficacy in managing attacks.²⁸

Pain catastrophizing, characterized by rumination and amplification of pain perception, leads individuals to feel overwhelmed by pain, resulting in greater difficulty in effectively managing migraine, with attention being directed toward bodily sensations and potentially triggering constant and repetitive threat-related thoughts.¹⁵ High levels of pain catastrophizing are associated with an increased perception of pain and suffering, which may encourage more frequent healthcare seeking and contribute to the chronification of pain. Individuals with this profile tend to amplify the pain experience and have difficulty diverting their attention away from pain, perpetuating a cycle of fear, anxiety, and worry. This cognitive-behavioral pattern can increase the frequency of migraine attacks and is strongly associated with greater functional disability and worsening quality of life.^{15,29,30}

Similarly, hypervigilance plays an important role in the pain process. The constant search for potential triggers functions as a protective mechanism but also leads to avoidance behaviors and increased sensitivity to painful stimuli.²⁰ This process can amplify the subjective intensity of pain, contribute to emotional distress, and promote the excessive use of analgesic medications.³¹ Furthermore, hypervigilance is negatively reinforced by the perceived success in pain prevention, making behavioral regulation more difficult. The positive and moderate correlation observed between pain catastrophizing and hypervigilance in this study aligns with evidence from meta-analyses on migraine, which indicate that higher levels of cognitive-behavioral factors are associated with greater functional disability.³¹

On the other hand, self-efficacy in the management of migraine plays a significant role in coping with pain, making it an important element in clinical assessment. In the context of chronic pain, the sense of personal efficacy is defined as the ability to manage one's own life and solve problems in an adaptive manner. In the context of migraine, this ability translates into control and coping strategies, such as self-confidence or the capacity to develop personal strategies to manage pain and maintain daily activities despite the condition.^{32, 33}

Individuals with high levels of self-efficacy show lower levels of disability related to chronic pain, in accordance with the results of this study. In this context, self-management involves actively participating in treatment by identifying individual characteristics and adapting pain management strategies according to personal needs, contributing to the reduction of disability.³⁴ Health education for individuals with migraine and the adoption of multimodal interventions can help increase self-efficacy, including measures such as behavioral therapies, dietary modifications, sleep hygiene, reduction of stimulating practices,³⁵ incorporation of relaxation activities, hydration, preventive treatment, and the use of a headache diary, which assists in tracking the number of attacks and recording important observations for self-management,^{34, 33} thereby reducing migraine-related disability.²⁰

Disability in migraine is still underestimated by the multidisciplinary care team; however, self-efficacy assessments have proven to be an indirect tool for detecting catastrophizing and hypervigilance, as individuals who perceive themselves as self-efficient in pain management tend to process pain experiences better.^{34, 36} The correlations of the cognitive-behavioral factors analyzed in this study demonstrate how fear and avoidance beliefs and behaviors can negatively impact the daily activities of individuals with migraine, contributing to functional disability. However, those with higher levels of body awareness and self-regulation, or self-efficacy, experience a positive effect on their ability to cope with pain, promoting adaptability in daily activities even in the presence of migraine symptoms.

This study presents some limitations, such as the relatively small sample size may, that might limit the generalizability of the findings. Additionally, no stratification was performed between episodic and chronic migraine, which could provide a more detailed understanding of differences between

subgroups. The absence of a specific assessment of anxiety and depression symptoms also represents a potential limitation, given the possible modulatory role of these factors in the analyzed outcomes. Nevertheless, the results highlight the relevance of investigating cognitive-behavioral aspects in individuals with migraine, considering their association with higher levels of functional disability.

Despite these limitations, it is important to emphasize the relevance of analyzing and assessing these cognitive-behavioral aspects in individuals with migraine. In Brazil, access to care for individuals with primary headache is predominantly conditioned by the 74% coverage provided by SUS; however, access to healthcare professionals trained in headache management is limited. According to the model of care for headache patients proposed by the Global Campaign against Headache,^{5,6} educational initiatives and the reorganization of healthcare system structures are considered relevant measures within the scope of health promotion, with the potential to address up to 90% of cases when appropriately managed in primary care.⁵ Disease-related concerns and treatment efficacy have been shown to have a significant impact on the pain experience.^{37,38}

Primary care professionals need adequate training to identify and address the beliefs and concerns of individuals with migraine. The findings of this study support using behavioral strategies in migraine management, helping integrate these approaches into care models and increasing patients' self-efficacy. This increase in self-efficacy can lead to a reduction in migraine-related disability. The study's results can guide healthcare providers not only in primary care settings but also in improving pain education and clinical management for people with migraine.

CONCLUSION

Higher levels of pain catastrophizing and hypervigilance are associated with greater disability, while higher self-efficacy is related to lower disability. These findings reinforce the importance of assessing cognitive-behavioral aspects and implementing strategies that enhance self-efficacy in the management of migraine.

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