

Correlation Between Severity of Migraine and Kinesiophobia, Level of Physical Activity and Disability in Patient with Migraine: A Cross-Sectional Study

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Abstract: ***Objective:** Migraine is a complex neurological disorder characterized by episodic headaches and sensory disturbances. This study aimed to investigate the correlation between migraine severity and kinesiophobia, physical activity level, and disability in patients diagnosed with migraine. **Method:** A cross-sectional study was conducted involving 208 patients diagnosed with migraine. Participants completed the Global Assessment of Migraine Severity (GAMS), Tampa Scale for Kinesiophobia (TSK-17), International Physical Activity Questionnaire (IPAQ), and Migraine Disability Assessment Scale (MIDAS). Statistical analysis using Spearman's correlation coefficient evaluated relationships between migraine severity and other variables. **Results:** Migraine severity showed a moderate positive correlation with kinesiophobia ($r=0.356$, $p<0.01$) and a strong positive correlation with disability ($r=0.418$, $p<0.01$). A negligible negative correlation was found between migraine severity and physical activity level ($r=-0.188$, $p<0.01$). Females represented 72% of the sample, consistent with known epidemiology. **Conclusion:** The findings indicate that increased migraine severity is associated with higher levels of kinesiophobia and disability, alongside reduced physical activity. These results highlight the importance of addressing psychological and physical components in migraine management.*

Keywords: Migraine Severity, Kinesiophobia, Physical Activity, Disability, Cross-Sectional Study, Tampa Scale

1. Introduction

Migraine is a complex, multifaceted neurological disorder characterized by recurrent, often debilitating headaches accompanied by a constellation of sensory, autonomic, and cognitive symptoms.^[1] It affects approximately 15% of the global population and is recognized as one of the leading causes of disability worldwide, particularly among young and middle-aged adults.^[2,3] The World Health Organization ranks migraine among the top causes of years lived with disability, underscoring its significant public health impact.^[4]

Clinically, migraine is defined by episodic attacks of moderate to severe headache pain, often unilateral and pulsating, lasting from 4 to 72 hours if untreated. These attacks are frequently accompanied by nausea, vomiting, photophobia (light sensitivity), phonophobia (sound sensitivity), and sometimes neurological disturbances known as aura.^[5,6] Migraine manifests through four overlapping phases: the premonitory phase characterized by subtle symptoms such as mood changes and neck stiffness; the aura phase involving reversible neurological symptoms; the headache phase where pain dominates; and the postdrome phase, marked by fatigue and cognitive difficulties.^[7,8]

Migraine classification includes episodic migraine (EM), where headache days are fewer than 15 per month, and

chronic migraine (CM), defined by headaches occurring 15 or more days per month for over three months, with migraine features on at least 8 days.^[9] CM patients commonly experience greater disability and reduced quality of life compared to those with EM.^[10] Epidemiological data consistently show a higher prevalence of migraine among women, especially during reproductive years, likely influenced by hormonal fluctuations and genetic factors.^[11,12]

Despite advances in understanding migraine pathophysiology, the disorder remains underdiagnosed and undertreated globally.^[13] Beyond headache intensity and frequency, migraine profoundly affects patients' functional capacity, psychological well-being, and social participation.^[14] Disability related to migraine encompasses limitations in work, household responsibilities, and leisure activities.^[15] The Migraine Disability Assessment Scale (MIDAS) is frequently employed to quantify this burden and guide clinical decisions.^[16]

An area of increasing research interest is kinesiophobia—defined as an excessive, irrational fear of movement due to anticipation of pain or injury.^[17] Originally studied in chronic musculoskeletal disorders, kinesiophobia has been identified as a potential contributor to activity avoidance and increased disability in migraine populations.^[18] This fear can lead to reduced physical activity, which, paradoxically, may exacerbate migraine severity and frequency through physical

deconditioning, increased stress, and impaired pain modulation. [19]

Physical activity is widely recommended as a non-pharmacological strategy for migraine prevention. Regular aerobic exercise has been shown to reduce attack frequency, severity, and improve psychological well-being. [20,21] However, migraine sufferers often reduce their physical activity levels due to fear of triggering attacks or exacerbating pain, highlighting a complex bidirectional relationship between migraine severity, kinesiophobia, and activity levels. [22,23]

While individual aspects of migraine-related disability, physical activity, and kinesiophobia have been studied, the interplay between migraine severity and these factors remains incompletely understood. Few studies have simultaneously evaluated how migraine intensity correlates with patients' fear of movement, physical activity levels, and functional disability. Understanding these relationships is crucial for developing comprehensive multidisciplinary interventions that address both the physical and psychological dimensions of migraine.

This cross-sectional study aims to investigate the correlation between migraine severity and levels of kinesiophobia, physical activity, and disability in a cohort of patients diagnosed with migraine. By elucidating these associations, the study seeks to inform evidence-based strategies that enhance patient management, mitigate disability, and improve quality of life.

2. Methodology

Study Design:

A cross-sectional correlation design was employed to evaluate relationships between migraine severity and kinesiophobia, physical activity, and disability among migraine patients.

Sample Size and Sampling Method:

A total of 208 participants diagnosed with migraine were recruited using convenience sampling. The sample size was determined using G*Power software to ensure sufficient power for detecting moderate correlations.

Participants (Diagnostic Criteria):

Eligible participants were adults aged 18 years and older, of both genders, medically diagnosed with migraine by qualified neurologists or physicians according to International Classification of Headache Disorders (ICHD) criteria. [24] Diagnosis was confirmed via clinical evaluation and medical certification documenting migraine according to established diagnostic guidelines. [24,25]

Inclusion Criteria: [11,12,25,26,27,28]

- Adults aged 18 years and above
- Both males and females
- Confirmed diagnosis of migraine by a medical professional per ICHD criteria
- Ability to read and understand study questionnaires
- Willingness to participate and provide written informed consent

Exclusion Criteria: [25,26,27,28]

- Individuals unwilling to participate
- Patients without a confirmed migraine diagnosis
- Those unable to read, write, or comprehend questionnaires
- Presence of other neurological or psychiatric disorders interfering with participation

Materials and Instruments:

- Pens and printed questionnaires for data collection
- **Global Assessment of Migraine Severity (GAMS):** A single-item seven-point scale measuring overall migraine severity from 1 (not severe) to 7 (extremely severe). [26]
- **Tampa Scale for Kinesiophobia (TSK-17):** A 17-item questionnaire assessing fear of movement related to pain. Scores range from 17 to 68, with higher scores indicating greater kinesiophobia. The tool has demonstrated excellent reliability. (ICC=0.93). [27]
- **International Physical Activity Questionnaire (IPAQ):** A validated self-report tool assessing physical activity levels over the past 7 days, categorizing individuals into low, moderate, or high physical activity based on MET-minutes per week. (ICC=0.76-0.88) [27]
- **Migraine Disability Assessment Scale (MIDAS):** Evaluates headache-related disability over the preceding 3 months in domains of paid work, household work, and social activities. Scores categorize disability as little/no, mild, moderate, or severe. (ICC=0.80-0.90) [16]

Procedure:

Patients who met inclusion criteria were approached during outpatient visits and provided detailed information about the study objectives and procedures. After obtaining written informed consent, participants completed the self-report questionnaires in a quiet setting under the supervision of trained research personnel.

For participants unable to complete questionnaires in person, electronic versions were sent via Google Forms with clear instructions. Follow-up reminders were sent to maximize response rates.

Demographic data including age, gender, and relevant clinical history were recorded.

Ethical Considerations:

The study protocol was reviewed and approved by the Institutional Ethics Committee. All participants provided informed consent. Confidentiality and anonymity were maintained throughout the study.

Statistical Analysis:

Data were analysed using IBM SPSS Statistics version 23. Descriptive statistics summarized demographic and clinical variables. Continuous variables were presented as mean \pm standard deviation, while categorical data were expressed as frequencies and percentages.

Spearman's rank-order correlation coefficients were calculated to examine relationships between migraine severity (GAMS) and kinesiophobia (TSK-17), physical activity (IPAQ), and disability (MIDAS). Correlation strength was interpreted as negligible (<0.3), low (0.3 to 0.5),

moderate (0.5 to 0.7), or strong (>0.7). Statistical significance was defined as $p < 0.05$.

3. Results

The present study included 208 clinically diagnosed migraine patients aged 18–74 years, with a mean age of 25.15 ± 9.62 years. Females constituted 72.12% (n=150) of the sample, while males accounted for 27.88% (n=58), consistent with the higher prevalence of migraine among women during reproductive years.

Table 1: Demographic data of age of patients

	N	Minimum	Maximum	Mean	Standard Deviation
Age	208	18	74	25.15	9.62

Table 2: Gender wise distribution of patients with Migraine

	Frequency	Percentage %
Male	58	27.88% (28%)
Female	150	72.12% (72%)
Total	208	100%

Migraine Severity (GAMS):

Migraine severity was assessed using the GAMS scale (1 = not severe to 7 = extremely severe). The mean score was 3.18 ± 1.82 , indicating moderate severity overall. Among participants, 26.44% (n=55) reported no severity, 25.48% (n=53) moderate severity, and 5.29% (n=11) extremely severe migraine.

Table 3: Percentage Distribution of GAMS in patients with Migraine

	Frequency	Percentage
Not at all severe	55	26.44%
Little severe	30	14.42%
Somewhat Severe	29	13.94%
Moderately severe	53	25.48%
Quite severe	10	4.81%
Very severe	20	9.62%
Extremely severe	11	5.29%

Kinesiophobia (TSK-17):

The TSK-17 assessed fear of movement (score range: 17–68), with 63% (n=130) of participants showing high kinesiophobia (score ≥ 37) and 37% (n=78) showing low kinesiophobia.

Table 5: Percentage distribution of TSK-17 in patients with Migraine

	Frequency	Percentage
High	130	63%
Low	78	37%

Physical Activity (IPAQ):

Physical activity was assessed using the IPAQ and categorized as low, moderate, or high based on MET-minutes/week. Most participants reported high physical activity (53.85%, n=112), followed by moderate (38.94%, n=81) and low activity levels (7.21%, n=15).

Table 6: Percentage distribution of IPAQ in patients with Migraine

	Frequency	Percentage
High	112	53.85%
Moderate	81	38.94%
Low	15	7.21%

Disability (MIDAS):

Disability was assessed using MIDAS, with 46% (n=95) of participants reporting little or no disability, 11% (n=24) mild disability, 16% (n=33) moderate disability, and 27% (n=56) severe disability.

Table 7: Percentage distribution of MIDAS in patients with Migraine

Grades	Meaning	Frequency	Percentage
1	Little or No Disability	95	46%
2	Mild Disability	24	11%
3	Moderate Disability	33	16%
4	Severe Disability	56	27%

Correlations Among Variables:

Spearman’s rank-order correlation was used to assess the relationship between migraine severity (GAMS) and other variables (TSK-17, IPAQ, and MIDAS) (Table 8). Migraine severity showed a moderate positive correlation with kinesiophobia ($r=0.356$, $p<0.01$) and a strong positive correlation with disability ($r=0.418$, $p<0.01$), while a negligible negative correlation was observed with physical activity levels ($r=-0.188$, $p<0.01$).

Table 8: Spearman’s correlation coefficient of GAMS with TSK-17, IPAQ and MIDAS

	GAMS – TSK-17	GAMS – IPAQ	GAMS – MIDAS
Spearman’s Correlation Coefficient	.356**	-.188**	.418**

** Correlation is significant at the 0.01 level (2-tailed)

4. Discussion

This study aimed to explore the relationship between migraine severity and kinesiophobia, level of physical activity, and disability among patients with migraine. The results revealed that migraine severity is moderately correlated with kinesiophobia and strongly correlated with disability, while demonstrating a negligible inverse association with physical activity.

The demographic profile indicated a female predominance (72.12%), consistent with global epidemiological data indicating that migraine disproportionately affects women, particularly during their reproductive years.^[11,12] Hormonal influences, genetic predispositions, and psychosocial factors have been implicated in this gender disparity.^[30]

The moderate positive correlation between migraine severity and kinesiophobia ($r=0.356$) suggests that patients experiencing more severe migraine attacks tend to develop an increased fear of movement. This fear may arise from repeated experiences where physical activity exacerbates headache intensity or triggers attacks, leading to avoidance behaviours. Such avoidance can contribute to physical

deconditioning and perpetuate a cycle of increased sensitivity and disability. [18,23]

Physical activity showed a small but statistically significant negative correlation with migraine severity ($r=-0.188$), indicating that patients with more severe migraines tend to have slightly lower physical activity levels. This is consistent with the literature suggesting that migraines often reduce activity due to fear of provoking attacks or worsening symptoms. [22,31] However, the weak strength of this correlation indicates variability in patient behaviours, possibly influenced by individual coping strategies, lifestyle factors, or variations in migraine patterns.

Disability, as assessed by MIDAS, was strongly correlated with migraine severity ($r=0.418$), highlighting the profound functional impact of severe migraine attacks. Increased frequency and intensity of migraine have been associated with greater impairment in work productivity, household tasks, and social participation. [15,16] These findings emphasize the importance of comprehensive management approaches targeting both symptom control and functional rehabilitation.

The findings align with prior studies reporting that fear of movement contributes to disability in chronic pain populations, including migraines. [14,24] Interventions aimed at reducing kinesiophobia, such as graded exposure to physical activity and cognitive-behavioural therapy, may help improve physical activity participation and reduce disability. [23,32]

5. Conclusion

In conclusion, this study demonstrates that migraine severity is significantly associated with increased kinesiophobia and disability, and with reduced physical activity. These findings support the integration of psychological and physical assessments and treatments in migraine management to reduce disability and improve patient quality of life.

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