THE RESEARCH NEXUS
ISSN: 3106-7867 | 3106-7859
Volume 2, Issue 4, 2025

MIGRAINE STIGMA, PAIN PERCEPTION, AND TREATMENT SATISFACTION

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Keywords
migraine related stigma, pain perception, treatment satisfaction

Article History
Received: 10 October 2025
Accepted: 15 December 2025
Published: 31 December 2025

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Abstract

This study explores the relationship between migraine-related stigma, pain perception, and treatment satisfaction, and examines pain perception as a mediator. Using a correlational design and purposive sampling (N=105), data were collected from hospital outpatients and social media users. Measures included demographic and clinical forms, the Migraine-Related Stigma Scale, the Pain Belief and Perception Inventory, and the Treatment Satisfaction with Medicines Questionnaire. Results showed that stigma was significantly associated with both pain perception ($r = .435$, $p < .01$) and treatment satisfaction ($r = .420$, $p < .01$). Regression analysis indicated stigma significantly predicted treatment satisfaction ($R^2 = .188$), with pain perception partially mediating this relationship. The findings underscore the need to address both stigma and pain perception to improve treatment outcomes for individuals with migraines.

INTRODUCTION

Treatment satisfaction is a crucial determinant in the management of chronic conditions like migraines, as it directly influences patient adherence to therapy and overall treatment outcomes. High treatment satisfaction typically leads to better adherence, which is essential for managing the frequency and severity of migraine attacks. Satisfaction with treatment is multifaceted, encompassing the effectiveness of the medication, the side effects, ease of use, and how well the treatment meets patient expectations. However, treatment satisfaction can be affected by various factors, including the individual's pain perception and the presence of migraine-related stigma. Individuals who perceive their pain as severe or who experience stigma may report lower satisfaction with their treatment, even if it is objectively effective.

Migraine is a prevalent and debilitating neurological disorder that affects approximately one billion people worldwide. Characterized by recurrent, severe headaches often accompanied by symptoms such as nausea, vomiting, and heightened sensitivity to light and sound, migraines significantly impact daily functioning and overall quality of life (Goadsby et al., 2022). Despite its high prevalence and severe effects, the condition is frequently misunderstood, leading to substantial psychosocial challenges for those affected. Recent research has increasingly focused on these psychosocial aspects, particularly migraine-related stigma, which can exacerbate the burden of the disorder (Schur & Finkel, 2023).

Migraine-related stigma refers to the negative societal attitudes and perceptions directed towards individuals suffering from migraines. This stigma can manifest in various forms, including social isolation, discrimination, and a diminished quality of life (Lipton et al., 2023). Individuals with migraines may face judgment or disbelief from others who do not fully understand the severity of their condition, leading to feelings of shame and reluctance to seek help. This stigma can have profound implications for an individual's mental health and well-being,

potentially worsening the overall impact of the disorder (Buse et al., 2022; Taylor et al., 2023).

The perception of pain in migraine sufferers is highly subjective and influenced by a multitude of factors. Pain perception varies widely among individuals and can be affected by the frequency and intensity of migraine attacks, psychological state, and the individual's environment (Stovner et al., 2023). Those with heightened pain perception may experience more severe functional impairments and difficulties in managing daily activities. Moreover, the experience of pain is not only a physiological phenomenon but also a psychological one, where negative social attitudes and stigma can amplify the perception of pain, creating a vicious cycle (Goadsby & Blumenfeld, 2023; Penzien et al., 2024).

Stigma and pain perception are intricately linked. The emotional burden of being stigmatized can exacerbate the experience of pain, as individuals may internalize negative societal attitudes, which in turn intensify their pain perception and contribute to a more profound sense of disability (Vernon & Kothari, 2024; Goadsby et al., 2022). This interaction between stigma and pain perception underscores the complexity of migraine management, highlighting the need for a comprehensive approach that addresses both the physical and psychological dimensions of the disorder (Schur & Finkel, 2023).

Treatment satisfaction is a crucial factor in the management of migraines, influencing how well individuals adhere to prescribed treatment regimens. It encompasses various elements, including the efficacy of the treatment, side effects, ease of administration, and alignment with patient expectations (Headache Classification Committee of the International Headache Society, 2021). High levels of treatment satisfaction are associated with better adherence to treatment protocols and improved long-term outcomes. However, stigma and pain perception can significantly impact treatment satisfaction. For instance, individuals who experience stigma may have lower expectations of treatment efficacy, leading to decreased satisfaction and poorer adherence (Lipton et al., 2023; Goadsby & Blumenfeld, 2023).

The interplay between stigma, pain perception, and treatment satisfaction creates a complex dynamic that affects the overall management of migraines. Stigma can undermine treatment satisfaction by fostering negative expectations and reducing engagement with healthcare services. Simultaneously, heightened pain perception can overshadow the benefits of treatment, even if the therapy is clinically effective, due to the subjective nature of the pain experience (Buse et al., 2022; Stovner et al., 2023). Understanding these interconnections is vital for developing more effective and holistic approaches to migraine management (Schur & Finkel, 2023; Taylor et al., 2023).

Objectives

- To examine the impact of migraine-related stigma on the pain perception of individuals suffering from migraines.
- To assess how individual perceptions of stigma affect treatment satisfaction in migraine patients.
- To investigate differences in treatment satisfaction based on the type of migraine experienced by individuals.
- To evaluate whether pain perception mediates the relationship between migraine- related stigma and treatment satisfaction in individuals with migraines.

Method

This research was designed to investigate the relationship between migraine-related stigma, pain perception and treatment satisfaction in individuals with migraine.

Sample and Sampling Technique

A cross-sectional correlational research design was selected for this study due to its suitability and efficiency in meeting the research objectives and constraints. Purposive sampling strategy was used to carry out this research study and the sample was recruited from neurology OPD of General Hospital Lahore comprising (N=105).

Inclusion Criteria

The study included adult participants aged 18 years and above, as per the World Health Organization guidelines (WHO, 2023). The sample was composed of women who were referred by either a neurologist

or a general practitioner (GP). Participants were those currently undergoing treatment with prescribed medications and had the ability to read, understand, and complete the study questionnaires independently.

Exclusion Criteria

The study excluded individuals with other primary headache disorders, such as cluster headaches and tension-type headaches. Additionally, participants with comorbid neurological conditions, such as epilepsy, were not included in the study. Pregnant women were also excluded from participation.

Assessment Measures

A self -constructed demographic sheet was administered in addition to other research tools to gain information about respondents. Demographic sheet included age, education, marital status, birth order, and monthly family income. Clinical information sheet included, age at the onset of illness, duration of illness and medication.

Migraine-Related Stigma

The Migraine Stigma Scale, developed by Shapiro in 2024, is a tool used to measure the extent of stigma experienced by individuals with migraine. The Migraine Stigma Scale is based on two major themes important to understanding migraine stigma: secondary gain and minimizing disease burden. Secondary gain refers to the perception that migraine is used for secondary gain, such as to get out of commitments or to gain attention, while minimizing disease burden refers to the perception that migraine is easily managed or not a significant medical condition. The scale includes 12 items that assess these themes, with responses ranging from stronglydisagree to strongly agree.

Pain Belief and Perception Inventory

It is a questionnaire developed by Williams & Thorn in 1989 with 16 itemsthat comprises four main dimensions of pain beliefs, mystery, permanence, constancy,and self-blame. Items are scored with a 4-point scale, from -2 (*fully disagree*) to 2 (*fully agree*). Four items are reverse scored: 3 (constancy), 9, 12, and 15 (permanence). The permanence dimension evaluates whether it is believed that pain ispart of life. The constancy dimension evaluates the belief in the endurance of pain throughout daily life. The mystery dimension refers to the mystery and understanding of pain. The self-blame dimension evaluates whether it is believed that one is the sole responsible of experiencing pain (Williams & Thorn, 1989).

Treatment Satisfaction with Medicines Questionnaire

The SATMED-Q (Treatment Satisfaction with Medicines Questionnaire) developed by
M.A Ruiz et al., in 2008 is a multidimensional generic questionnaire designed to assess treatment satisfaction in patients with chronic diseases like diabetes, arterial hypertension, and heart failure. Here are some key details about the SATMED-Q questionnaire based on the provided sources: The SATMED-Q is structured into six dimensions, exploring various aspects of treatment satisfaction. These dimensions include drug efficacy, side effects, convenience of use, medical care, impact on daily activities, and general satisfaction. The questionnaire consists of 17 Likert-type items and provides a total composite score for treatment satisfaction bysumming up scores from all domains. The total composite score ranges from 0 to 68, with higher scores indicating greater treatment satisfaction. The SATMED-Q hasbeen validated as a reliable measure of treatment satisfaction, demonstrating good psychometric properties for assessing patient satisfaction with medications. It is considered a feasible and easy-to-administer tool for self-assessment (M.A Ruiz et al., in 2008). (See appendix)

Procedure

Initially, permission was sought from the institute´s authorities to conduct the study. This included obtaining approval from the administrative bodies of the hospital where the research was carried out. Additionally, permission was obtained from the authors or publishers of the standardized assessment measures used in the study. This was crucial to ensure that the instruments were used appropriately and legally, respecting copyright and intellectual property rights. Following these approvals, the process proceeded with the administration of the questionnaires. Participants first completed a

demographic sheet alongside this, a clinical information sheet was filled out to capture specific details related to the participants' medical histories and current health status. Participants also completed standardized assessment measures tailored to the study's variables. These measures were designed to objectively assess various aspects related to the research objectives, such as migraine related stigma, pain perception and treatment satisfaction. Before starting data collection, the study underwent an ethical review by the Institutional Review Board (IRB) or Ethics Committee. Data was collected and data analysis was done on SPSS version 23.00, for testing hypothesis and getting the results. The findings were reported to the best of accuracy and precision. The discussion was made on the findings.

Results

After the completion of data collection, the data was entered in SPSS version 27.00 for further analysis. The psychometric properties and descriptive statistics of assessment measures was used to assess study variables including migraine related stigma, pain perception and treatment satisfaction which were sought using Cronbach's alpha and mean, standard deviation, ranges, skewness and kurtosis. The values were sought and are presented in table 1.

Table 1

Psychometric Properties of Scales (N=105)

Variables	k	α	M	SD	Skewness	Kurtosis	Range Potential Range	Actual Range
Migraine Related Stigma (MiRS)	12	.814	22.65	5.5	-.61	.06	0-36	8-35
Secondary	7	.74	12.80	3.77	-.66	.53	0-21	1-21
Minimizing	5	.60	9.80	2.35	-.23	.16	0-15	3-15
Pain Belief and Perception (PBPI)	16	.74	30.00	5.1	-.61	.61	0-48	16-39
Pain as	4	.60	7.40	1.84	-.52	1.25	0-12	1-12
Pain as	4	.81	16.0	3.2	-.74	.74	0-12	3-10
Pain as	4	.80	8.64	2.24	-1.27	1.60	0-12	1-12
Self-Blame	4	.64	5.06	1.85	.01	.45	0-12	0-9
Treatment Satisfaction	17	.85	41.6	8.9	-1.58	.99	0-68	8-58
Gain Burden Inventory Mystery Constant Permanent with Medication (SATMED_Q)								

Note: α=reliability Coefficient; K=no. of items in scales and subscales; M=mean; SD=Standard Deviation

Table 1 presents psychometric data on various psychological scales related to migraine stigma, pain beliefs, and treatment satisfaction. The Migraine Related Stigma (MiRS) scale and its subscales show moderate to good internal consistency, with participants generally reporting moderate stigma. The Pain Belief and Perception Inventory (PBPI) and its subscales exhibit acceptable reliability, revealing that participants hold moderate beliefs about pain, with pain as constant being particularly prominent. The Treatment Satisfaction with Medication (SATMED_Q) scale shows strong reliability, with participants reporting generally high satisfaction. The table 4.1 also shows that the skewness and kurtosis value of the study constructs are within the range of ±1 which is an indication that the data of all variables are normally distributed (Bryne, 2010), except for pain as permanent and treatment satisfaction with medication, which shows negative skewness, meaning most individuals tend to score higher on these scales.

THE RESEARCH NEXUS
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Volume 2, Issue 4, 2025

Table 2

Correlation between MiRS Secondary Gain, MiRS Minimizing Burden (Migraine Related Stigma Scale), Pain Belief and Perception Inventory, Treatment Satisfaction with Medication Questionnaire. (N=105)

Variables	1	2	3	4	5	6	7
Migraine Related Stigma	_						
Treatment Satisfaction with Medication	.420**	_					
Pain Belief and Perception	.435**	.510**	_				
Pain as Mystery	.025	-.066	.470**	_			
Pain as Constant	.380**	.510**	.710**	.032	_		
Pain as Permanent	.446**	.700**	.701**	-.077	.650**	_	
Self-Blame	.209*	.074	.591**	.211*	.164	.089	_

Note: $^{**}p < .01$, $^{*}p < .05$

Table 2 indicates that Migraine Related Stigma showed positive correlations with Treatment Satisfaction with Medication, Pain Belief and Perception, Pain as Constant, and Pain as Permanent which means that higher stigma is associated with greater satisfaction with medication and individuals who feel stigmatized might perceive their pain as permanent and constant. Moreover, Treatment satisfaction with Medication was positively associated with Pain Belief and Perception, Pain as Constant, and Pain as Permanent which means those who are satisfied with their treatment are more aware of their pain perceptions. Pain Belief and Perception showed highly significant positive correlations with Pain as Mystery, Pain as Constant, Pain as Permanent, and Self-Blame. This indicates that individuals who has strong beliefs about their pain's nature may also see it as mystery and constant, and may blame themselves for their condition. Also, Pain as Constant was highly significant positively correlated with pain as Permanent. Which shows viewing pain as constant is highly correlated with viewing it as permanent. However, Migraine Related Stigma showed a moderately significant positive correlation with Self-Blame. Also, Pain as Mystery showed a moderately significant positive correlation with Self-Blame. Moderate significance here suggests that those who view their pain as a mystery might be more prone to blame themselves for their condition.

Table 3

Hierarchical Regression Analysis to establish predictors of Treatment Satisfaction (N=105)

Variables	Model 1			Model 2		
	B	β	SE	B	β	SE
Constant Age	-3.58	-0.11	3.19	-6.42	-0.21	2.92
Education	3.15	0.19	1.64	2.40	0.14	1.48
Work Status						
Migraine Related Stigma	.73	0.11	0.65	0.27	0.04	0.60
R^2						
ΔR^2				1.07	0.45	0.21

Note: $^{*}p < .05$, $^{**}p < .01$, $^{***} < .001$; *β= Standardized Coefficient Beta*

The table shows that in Model 1, age, education, and work status were entered as predictors. This model was not statistically significant ($p = .091$) and accounted for 6.2% of the variance in Treatment Satisfaction. In Model 2, Migraine Related Stigma was added as an additional predictor. This model was statistically significant $p < .001$, and accounted for 25% of the variance in Treatment Satisfaction. The addition of Migraine Related Stigma explained an additional 18.8% of the variance, after controlling for age, education, and work status.

Moreover, age emerged as a significant predictor in Model 2, indicating that older individuals tend to have lower scores on treatment satisfaction. Conversely, education and work status were not significant predictors in this model, suggesting that

these factors do not have a meaningful impact on treatment satisfaction when controlling for migraine-related stigma and age.

Table 4

Mediation Analysis of Migraine Related Stigma, Pain Belief and Perception Inventory, Treatment Satisfaction with Medication

Relationship	Total effect	Direct effect	Indirect Effect	Confidence Interval	t-statistic	conclusion
				Lower Bound	Upper Bound	
MiRS>PBPI>SATME DQ						
0.98***						
0.57**	0.41*	0.14	0.71	4.61		
Partial Mediation						

Note: MiRS = Migraine Related Stigma, PBPI= Pain Belief and Perception Inventory, SATMEDQ= Treatment Satisfaction with Medication

Table 4 shows the results of mediation analysis. The total effect of migraine related stigma on treatment satisfaction with medication was significant. The direct effect of migraine related stigma on treatment satisfaction with medication controlling for pain belief and perception was significant. The indirect effect of migraine related stigma on treatment satisfaction with medication through pain belief and perception was significant. These results suggest that pain belief and perception partially mediates the relationship between migraine related stigma and treatment satisfaction with medication, indicating partial mediation.

Table 5

Mean, Standard Deviation and Analysis of variance of Treatment Satisfaction with Medication with type of Migraine

Measures	Episodic		Chronic		Menstrual		F	*p*	Partial η^2
	M	*SD*	M	*SD*	M	*SD*			
Treatment Satisfaction with Medication	49.5	12.3	46.4	13.6	40.5	18.2	2.0	.131	.039

*Note: M is the mean value and SD is standard deviation, *p<.05, **p<.01, ***<.001*

Table 5 shows no statistically significant differences in treatment satisfaction scores between episodic, chronic, and menstrual headache types. The small partial η2 of .039 suggests headache type explains little of the variance in satisfaction scores.

Discussion

The present chapter contains the key findings of the current study and how these findings fit into the current knowledge based on Migraine Related Stigma, Pain Perception and Treatment Satisfaction in Individuals with Migraine. It interprets the implications of the statistical associations uncovered, explores the consistency of the results with existing literature and highlights various factors that contributes to the treatment with medication outcomes. The analysis indicated that the significant positive correlations between migraine- related stigma and various dimensions of pain perception (particularly overall pain belief and perception, pain as constant, and pain as permanent) suggested that individuals experiencing higher stigma are more likely to perceive their pain as ongoing and unending. Studies have shown that stigma can lead to increased

disability and decreased quality of life in individuals with migraines. The Migraine Report Card survey found that individuals with higher perceived stigma reported greater pain and disability, which negatively impacted their daily functioning and treatment outcomes (Buse et al., 2020; Seng et al., 2021). Additionally, the International Association for the Study of Pain (IASP) highlighted the relationship between stigma and heightened pain perception, indicating that stigma can make individuals feel their pain is more constant and enduring, thus increasing the psychological burden and potentially affecting treatment satisfaction (IASP, 2021).

There is a significant positive correlation between migraine-related stigma and treatment satisfaction with medication. This suggests that higher perceived stigma is associated with higher treatment satisfaction. As evidenced by literature the OVERCOME survey highlights that migraine-related stigma is prevalent among individuals with migraines and is linked to various negative outcomes, including treatment satisfaction. It suggests that individuals experiencing higher levels of stigma may also report higher satisfaction with their treatment, although the overall satisfaction rates were low. For instance, only 33.2% of traditional preventive users reported high satisfaction with their current medication, and this satisfaction decreased with the frequency of headache days (Pascual et al., 2023). Another study supported the findings the literature suggests that internalized stigma can lead to lower self- esteem and reduced likelihood of seeking optimal care, which may paradoxically lead to higher reported satisfaction with existing treatments, as patients may feel a sense of relief from any treatment they receive, despite its effectiveness (Buse et al., 2024).

The study also found that age emerged as a significant predictor in Model 2, indicating that older individuals tend to have lower scores on treatment satisfaction. This finding is consistent with research suggesting that older adults may face unique challenges in managing their migraines, such as comorbidities and polypharmacy, which can impact their treatment satisfaction (Buse et al., 2010). Additionally, older individuals may have different expectations and preferences regarding their treatment, which can influence their overall satisfaction (Lipton et al., 2013).

The current study found that pain perception partially mediates the relationship between migraine related stigma and treatment satisfaction is consistent with the OVERCOME survey results show that stigma is prevalent among migraine sufferers and correlates with increased pain perception and disability. The study found that individuals who reported higher stigma levels also experienced greater pain intensity, which subsequently influenced their satisfaction with treatment. This relationship underscores the mediating role of pain perception in the context of stigma and treatment satisfaction (Pascual et al., 2023).

Our study indicated that there are no statistically significant differences in treatment satisfaction with medication based on the type of migraine experienced by individuals. While mean satisfaction scores vary, these differences are not significant enough to draw definitive conclusions about the impact of migraine type on treatment satisfaction. A study by OVERCOME study analyzed treatment patterns and satisfaction among migraine patients and found that while satisfaction scores varied across different types of migraines, these differences were not statistically significant. The study emphasized that overall patient satisfaction was generally low, with only 33.2% of traditional preventive users reporting high satisfaction, suggesting that migraine type did not markedly influence treatment satisfaction levels among participants (Pascual et al., 2023).

Conclusion

The present study investigated the factors influencing migraine-related stigma, pain perception, and treatment satisfaction in individuals with migraines. The key findings revealed significant correlations among stigma, pain perception, and treatment satisfaction. Migraine-related stigma was positively correlated with various dimensions of pain perception, particularly overall pain belief and perception, pain as constant, and pain as permanent, indicating that individuals experiencing higher stigma are more likely to perceive their pain as ongoing and unending.

A significant positive correlation was found between migraine-related stigma and treatment satisfaction with medication, suggesting that higher perceived stigma is associated with higher treatment satisfaction. Despite overall low satisfaction rates, individuals experiencing higher levels of stigma may report higher satisfaction with their treatment, possibly due to relief from receiving any treatment despite its effectiveness. No statistically significant differences were observed in treatment satisfaction based on the type of migraine experienced by individuals. The study also found that age emerged as a significant predictor in Model 2, indicating that older individuals tend to have lower scores on treatment satisfaction.

Pain perception partially mediated the relationship between migraine-related stigma and treatment satisfaction. Individuals reporting higher stigma levels also experienced greater pain intensity, subsequently influencing their satisfaction with treatment

Recommendations and Limitations

The cross-sectional design of this study limits its ability to establish causal relationships between variables. Since data is collected at a single point in time, it is challenging to determine the temporal sequence of events or ascertain whether migraine-related stigma directly influences treatment satisfaction. Additionally, participants may rely on memory to report past behaviors or experiences, increasing the possibility of recall bias, where inaccuracies in recalling or reporting certain information may occur. Measurement errors could also have arisen due to factors such as self-reporting bias, misinterpretation of questions, or inconsistencies in data collection methods, potentially affecting the validity and reliability of the study results. Furthermore, there is a risk of selection bias, as the characteristics or behaviors of the participants may not fully represent the entire target population. Lastly, the study did not account for all possible confounding factors that might influence the relationships between stigma, pain perception, and treatment satisfaction.

Implications of Study

Although the study cannot establish cause-and-effect relationships, it offers a snapshot of correlations that may exist at a particular point in time. This approach provides valuable insights into the experiences of individuals with migraines and lays the groundwork for future research using experimental or longitudinal studies. Cross-sectional studies like this one are useful research tools in health research, as they help researchers better understand relationships among specific variables—in this case, migraine-related stigma, pain perception, and treatment satisfaction. By examining these connections, the study can inform the development of additional research that explores these conditions in greater depth.

The study emphasizes the importance of considering patients' perceptions of pain and their satisfaction with treatment as critical components of migraine management. Tailoring treatment plans to address these perceptions and ensuring that patients feel understood and supported can enhance treatment outcomes. Furthermore, the findings highlight the need for policies that address the broader social determinants of health, including the stigma associated with chronic conditions like migraines. Advocacy efforts should focus on raising awareness about migraines as a serious neurological condition that requires appropriate medical attention and support, rather than being dismissed as a minor inconvenience.

Educational programs for healthcare professionals should incorporate training on the psychological and social dimensions of migraine management. By understanding the impact of stigma on pain perception and treatment satisfaction, healthcare providers can deliver more empathetic and effective care. Additionally, the partial mediation of pain perception in the relationship between migraine-related stigma and treatment satisfaction suggests that holistic approaches, combining both pharmacological and psychological interventions, may be more effective. Techniques such as cognitive-behavioral therapy (CBT) could be integrated into treatment plans to help patients manage their pain perception and mitigate the impact of stigma.

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