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Assessment of Headache Disability and Impact: A Review of Standardized Questionnaires

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ABSTRACT

Background: Headache disorders represent one of the most common neurological conditions and are consistently identified as significant contributors to worldwide disability. Their recurrent nature and impact on daily activities, productivity, and psychological well-being underline the necessity of accurate assessment. Since clinical measures alone cannot fully capture the burden of headache, self-reported questionnaires have been developed to evaluate its multidimensional impact. Various instruments—such as the Migraine Disability Assessment (MIDAS), Headache Impact Test (HIT-6), as well as Headache Disability Inventory (HDI)—offer distinct advantages and limitations. A systematic review of these tools is essential to guide clinicians and researchers in selecting appropriate measures and to identify areas requiring further refinement.

Aim of study: This study aimed to review and critically evaluate self-reported questionnaires used to assess headache impact and disability, highlighting their strengths, limitations, and applicability in clinical and research settings.

Conclusion: A wide range of questionnaires has been done to evaluate headache-related impact and disability, reflecting the complex and multidimensional nature of this condition. While instruments such as MIDAS, HIT-6, HDI, and MSQ Migraine-Specific Quality of Life Questionnaire provide useful insights, none captures all aspects of headache burden comprehensively. Future work should focus on integrating functional, psychological, and cultural dimensions into more robust and universally applicable assessment tools.

Keywords: Headache - Reliability - Feasibility – Assessment Tools – Questionnaires – Quality of Life.

INTRODUCTION

Headache disorders rank as the second leading cause of disability globally [(1)]. Thirty-three percent of patients report that headaches adversely affect their careers along with family relationships [(2)]. All headache types, particularly migraines, are significantly linked to diminished quality of life (QOL) [(3)]. In Arab countries, especially Egypt, the most prominent country in the Middle East, various challenges hinder effective headache management. These include inadequate patient education, the tendency of family members to underestimate the importance of headaches, and the accessibility of analgesics as over-the-counter self-medications, coupled with limited access to prescription medications [(4)].

One study aimed to estimate the prevalence of migraine among different age groups within the Assiut district of Egypt. The study was conducted door-to-door. The study comprised 4,700 chosen at random individuals. A total of 1,668 subjects (35.49%) reported experiencing headaches, with 87.65% of these cases classified as primary headaches. The prevalence of migraine was 10.51%, particularly among individuals aged 20 to 40 years. Approximately 63.5% experienced frequent attacks, with 65.2% of these attacks being severe enough to disrupt daily activities and lasting for more than one day. Around 5.6% of individuals experienced chronic migraine, while 1.2% reported daily migraine from the outset. Additionally, 24.2% experienced a transformation from periodic to chronic migraine [(5)].

Migraine headaches were common among people with a medium level of education and those who worked in manual jobs. Although the frequency and severity of chronic or daily migraines increased with age, the average length of migraine attacks decreased with aging. Comorbidities such as depression, anxiety, irritable bowel syndrome, as well as hypertension were frequently observed in migraine patients [(5)].

Headache types and classifications:

A study carried out in Fayoum Governorate found that migraine headaches accounted for 17.3% of all headaches, whereas episodic tension type headaches (ETTH) accounted for 24.5%. Several factors contribute to the under recognition of headaches in Egypt, including a lack of specialized headache facilities, general practitioners as well as household members ignoring the prevalence of "headache disorders," inadequate patient education, as well as the availability of over-the-counter (OTC) pain medicines. According to **El-Sherbiny *et al.*** [(6)], these obstacles definitely impact headache treatment.

2.95 percent of men and 4.8 percent of women in Al-Quseir, Red Sea Governorate, had migraines. **El-Tallawy *et al.*** [(7)] showed that the peak prevalence rates occurred between the ages of 18 and 40 for both sexes, with a total prevalence of 4.77/100 (2.89/100 for males and 6.53/100 for females). Patients' psychological and

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financial health, as well as the severity of their chronic disorders, can be predicted using disability measurement. While there are a variety of pain and QOL assessments available, the majority of the available data is from studies focusing on certain headache disorders, including migraines [8].

Headaches are among the most common and diverse types of pain conditions, having an impact on a large percentage of the population around the world. The classification of headache types is essential for accurate diagnosis and effective treatment. The International Classification of Headache Disorders (ICHD), currently in its third edition (ICHD-3), categorizes headaches into primary and secondary types, offering a systematic framework that has been universally adopted. Primary headaches are those not caused by another condition, whereas secondary headaches are symptomatic of another underlying issue, such as trauma, infection, or a vascular event [9]. This classification system includes well-known primary headache types such as migraine, TTH, and cluster headache, which are differentiated based on their pathophysiology, clinical presentation, and response to treatments [10].

Headache disorders are a major cause of disability worldwide, significantly impacting the quality of life of individuals. Measuring the disability caused by headaches is crucial for assessing treatment effectiveness and guiding clinical decisions. Over the past decade, several tools have been developed and validated for measuring headache disability, with focusing on migraine-related disability. One of the most widely used tools is the Migraine Disability Assessment (MIDAS), which was done to examine the effect of migraines on daily functioning over a three-month period. This tool has been extensively studied and validated for its effectiveness in assessing headache-related disability [11]. Studies show that MIDAS is sensitive to treatment interventions, reflecting improvements in functioning and quality of life as patients receive appropriate care [12]. Moreover, it is now widely recommended for use in clinical practice, as it provides valuable insights into the burden of migraine on daily activities, including work, household chores, and social participation. The Headache Impact Test (HIT-6) is another key tool used for evaluating headache disability. It has similar applications to the MIDAS but is designed for greater accessibility, including internet-based formats [13]. The Headache Impact Test Questionnaire [14] (HIQ) is one of the most prominent headache-specific questionnaires for assessing headache related disabilities as well as Migraine-Specific Quality of Life Questionnaire Version 2.1 [15], Migraine Disability Assessment [16], and Headache Self-Efficacy Scale [17].

The migraine impairment assessment as well as migraine-specific quality of life questionnaire version 2.1 were made for assessing headache related disability among migraine patients. The headache self-efficacy scale, which has 51 questions, is for finding out how confident migraine patients are in their own abilities. The headache effect questionnaire only has 8 questions and doesn't cover a lot of different types of disabilities, like emotional as well as functional ones. For both tension and migraine headaches, the validity and reliability of the HIQ were validated using localization. On the other hand, cluster headaches and other types of headaches were not considered when determining its validity. One of the most extensive questionnaires developed to measure the disability of headache sufferers is the Henry Ford Hospital Headache Disability Inventory (HDI). The purpose of this questionnaire is to measure the psychological and practical effects of headache on people's day-to-day functioning. There were forty items in the first HDI (alpha-HDI), however there are now only twenty-five in the most recent beta version (beta-HDI). A generic headache disability questionnaire that has been extensively used in relevant research investigations is the English-language Beta version of the Headache Disability Index (HDI), which was developed by **Jacobson *et al.*** [18].

Jacobson *et al.* [18] developed a questionnaire to assess the impact of various medical and rehabilitative treatments on the physical and emotional problems experienced by patients with various types of headaches. There is no specific type of headache that this general questionnaire is designed to assess. Consequently, HDI was utilized for monitoring the overall effects of various headache types and to compare various disability elements for different forms of headaches. The literature indicates that the original HDI possesses high levels of construct validity as well as internal consistency/reliability. According to test-retest results, while taking into account the overall questionnaire and its subscale scores, HDI has a satisfactory level of reliability [19].

The PedMIDAS is a modified version of the MIDAS specifically developed for pediatric patients to assess headache-related disability in children in addition to adolescents. This tool has shown good internal consistency and test-retest reliability [20]. Its validity has been demonstrated by correlations with headache frequency, severity, and duration, making it a useful instrument for monitoring the progress of migraine treatments in younger populations. In a similar vein, the Headache Disability Inventory (HDI) is another comprehensive tool used to assess both the functional and emotional aspects of disability caused by headaches. The HDI was originally developed for

adults and has been adapted for use in various cultures, demonstrating good reliability and validity across different languages [21].

The development of more specific tools, such as the Headache Acceptance Questionnaire (HAQ), highlights a shift toward measuring not only the physical disability caused by headaches but also the psychological acceptance of chronic pain. This questionnaire assesses a patient's willingness to live with pain and continue engaging in meaningful activities despite headache symptoms. The HAQ has shown promising results in measuring the psychological aspects of headache disability, offering a more comprehensive understanding of how patients cope with their condition [22].

Additionally, newer methods, such as the Chronic Pain Index, emphasize the role of functional impairment in measuring headache severity, acknowledging that both pain intensity and the degree of interference with daily activities participate significantly to the overall burden of headache disorders [23].

Henry Ford Hospital Headache Disability Inventory (HFDHI):

Among the most comprehensive instruments for measuring the impairment of individuals with headaches, the Henry Ford Hospital Headache Disability Inventory (HDI) focuses on the emotional and functional consequences of daily living. The original HDI (alpha-HDI) had 40 items and used a 5-point scale for "yes," 2-point for "sometimes," and 0-point for "no" responses. The trial's patients' answers served as the empirical basis for the items. Based on the original alpha version, **Jacobson *et al.*** [18] created a 25-item beta version (beta-HDI) by dividing the items into emotional as well as functional subscales.

In the HDI, the maximum potential score is 100, with a minimum score of 0, which helps to measure the extent of disability experienced by patients. The functional and emotional subscales each have a maximum score of 48 and 52, respectively. Research has shown that patients with a few total HDI score of less than 29 (with a 95% confidence interval) don't encounter significant improvements with headache treatments, making this score a useful predictor in assessing treatment effectiveness [24].

The beta-HDI is utilized to assess both the emotional and functional impacts of headaches. A study on the Persian version of the HDI confirmed the internal consistency in addition to reliability of the tool with a Cronbach's alpha of 0.91 for the entire questionnaire, and the test-retest reliability was found to be 0.97, indicating that the tool is both valid and reliable in different cultural contexts. The HDI also demonstrated significant correlations with the Short-Form Health Survey (SF-36), supporting its convergent validity [25].

Furthermore, the HDI has been adapted for use in various languages and cultures, and recent studies have continued to confirm its applicability in diverse populations. For instance, the Turkish version of the HDI was validated through a series of psychometric evaluations, including confirmatory factor analysis (CFA) along with exploratory factor analysis (EFA), It demonstrated strong internal consistency as well as structural validity (Cronbach's alpha = 0.935) [24].

Validity and Reliability of Health Questionnaires

Clinical measuring tools should have their psychometric qualities defined before they can be confidently employed in research or patient treatment. Instruments should prove their dependability by consistently producing the same results when administered to a group of patients who are in a stable clinical state (repeatability). They should also show that the questionnaire items are closely related to each other, indicating that they assess the same characteristic (internal consistency). According to **Beaton *et al.*** [26], validity is the degree to which a questionnaire accurately measures its target construct and produces meaningful results.

Prior research by **Franco *et al.*** [27] established the validity and reliability of HDI versions other than English, including Spanish. Valid and accurate instruments to assess the functional and emotional states of patients with various headache conditions are needed by Arabic researchers and practitioners.

Another study by **Pradela *et al.*** [28] examined the Brazilian Portuguese version of the HDI. This study focused on the cross-cultural adaptation, validity, and reliability of the translated HDI in a sample of Brazilian patients with headache disorders. The study found that the preliminary version of the questionnaire required minor linguistic adjustments for better cultural adaptation. The final version achieved an internal consistency of 0.84 and maintained a factor structure similar to the original English HDI. The study also conducted construct validity analysis, showing a strong correlation among the Brazilian HDI and other disability measures such as the HIT-6 and the Short Form-12 (SF-12). The test-retest reliability was found to be excellent (ICC = 0.95), ensuring stability over time. Based on these findings, the authors concluded that the Brazilian HDI is a valid and reliable instrument for assessing headache-related disability in Portuguese-speaking patients.

A study by **Asawavichienjinda *et al.*** [29] Examined the Thai version of the MIDAS questionnaire, confirming its internal consistency as well as reliability for assessing migraine-related

disability. The researchers conducted forward translation, back translation, and expert panel review to guarantee the linguistic and conceptual validity of the Thai MIDAS. A Cronbach's Alpha of 0.98 was reported, indicating excellent internal consistency. In addition, test-retest reliability was also strong, using ICCs (intraclass correlation coefficients) between 0.89 and 0.98, reinforcing the stability of the questionnaire over time. The study concluded that the Thai MIDAS was a highly reliable tool for measuring headache-related disability, further supporting the robustness of headache disability questionnaires across different cultural adaptations.

Another study that supports these findings is the validation of the Spanish version of the MIDAS questionnaire by **Rodríguez-Almagro *et al.*** [30] this study assessed the internal consistency as well as reliability of the Spanish MIDAS in university students with migraines. The Cronbach's Alpha for the MIDAS was 0.797, confirming a good level of internal consistency. The study also found a strong correlation between the MIDAS scores and functional limitations due to migraines, supporting its validity. The results indicate that headache-related disability questionnaires consistently demonstrate strong internal consistency, regardless of linguistic or cultural adaptations.

A study by **Ferreira *et al.*** [31] validated the Portuguese version of the Modified Migraine Disability Assessment (mMIDAS-P). Their findings revealed that the test-retest reliability was strong, with an ICC value exceeding 0.90, confirming that the questionnaire is a stable tool for measuring migraine-related disability. The study further emphasized the importance of ensuring reproducibility in headache disability questionnaires to improve their effectiveness in patient assessment and treatment planning.

A study by **Hamer *et al.*** [22] explored the development of the HAQ, a tool designed to assess patients' acceptance of headache-related disability. The researchers emphasized the importance of questionnaire feasibility, ensuring that respondents could complete the survey with minimal difficulty. The HAQ, after multiple rounds of expert reviews and patient feedback, was reduced from 45 to 19 items, with final factor analysis producing a unidimensional six-item measure. The study found that patients were able to complete the questionnaire efficiently, and the low item-missing rate confirmed its usability. The HAQ distinguished between different headache disorders, demonstrating that a well-structured and concise questionnaire enhances feasibility and clinical applicability.

Similarly, a study by **Peña *et al.*** [32] investigated feasibility factors in headache-related disability assessments among patients with persistent post-traumatic headache (PPTH). This study evaluated the feasibility of utilizing the MIDAS questionnaire in a clinical population. The study found that patients with PPTH could reliably complete the MIDAS questionnaire, and the results correlated well with headache severity and psychological factors such as anxiety and depression. The study concluded that a headache disability questionnaire must be both user-friendly and clinically relevant to ensure effective integration into healthcare settings.

Another study by **Katsarava *et al.*** [33] examined the burden of migraine across multiple countries using standardized headache disability assessments. The study was carried out in the United States, Canada, France, Germany, Japan, and the United Kingdom, the study examined the practicability of administering the Work Productivity and Activity Impairment (WPAI) in addition to the Migraine-Specific Quality of Life Questionnaire (MSQ v2.1). The researchers reported that feasibility factors, such as the time required for completion and ease of administration, were crucial in ensuring high patient compliance. The study found that self-reported measures of migraine disability were feasible for large-scale epidemiological studies, particularly when digital administration methods were used.

A more recent study by **Alahmadi *et al.*** [34] in Saudi Arabia examined disability and QOL among migraine patients using the MIDAS and SF-36 questionnaires. The study surveyed 103 patients previously diagnosed with migraines, of whom 64.1% were females, and the mean age was 36.7 years. The study found a strong correlation between headache disability and reduced quality of life across multiple domains, particularly in the physical and emotional components of daily life. Moreover, the study emphasized the necessity of regular monitoring of migraine-related disability to minimize its long-term impact on patients' well-being.

Another study by **Albano *et al.*** [35] examined test-retest reliability in headache outcome measures among patients undergoing headache surgery. The study used multiple validated headache disability questionnaires, including the MIDAS and the HIT-6, to track changes in patient-reported outcomes over time. The study found that test-retest correlations for MIDAS and HIT-6 exceeded 0.90, demonstrating high stability in repeated assessments. Additionally, Wilcoxon Signed-Rank Tests showed no significant differences in preoperative and short-term postoperative disability scores when no surgical intervention occurred, confirming that headache disability measures maintain consistency when no external treatment is introduced.

CONCLUSION

Headache-related disability represents a significant public health concern that necessitates reliable and valid tools for assessment. The reviewed questionnaires provide valuable insights into the multidimensional impact of headache disorders, including functional impairment, quality of life, and psychological burden. While each instrument has distinct advantages, careful selection should be based on the study objectives, clinical context, and cultural appropriateness. Future research should continue to refine and validate these tools to ensure more accurate evaluation and enhanced patient outcomes.

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The author declares no conflict of interest.

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