

# Comparison of validity and reliability of the Migraine disability assessment (MIDAS) versus headache impact test (HIT) in an Iranian population

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Abbas Ghorbani<sup>1</sup>, Ahmad Chitsaz<sup>2</sup>

<sup>1</sup> Associate Professor, Department of Neurology, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>2</sup> Associate Professor, Department of Neurology, Isfahan University of Medical Sciences, Isfahan, Iran

## Keywords

Migraine, Headache Impact Test, Migraine Disability Assessment, Validity, Reliability

## Abstract

**Background:** Migraine is one of the most common headaches that affect 11% or more adult population. Recently, researchers have designed two questionnaires, namely Headache Impact Test (HIT) and Migraine Disability Assessment (MIDAS), with the aim of improving migraine care. These two tests provide a standard measurement about migraine's effects on people's life style that divide patients into 4 groups (grades) based on headaches intensity. The aim of this study was to compare the validity and reliability of these two tests.

**Methods:** This study was designed as a multicenter, descriptive study to compare validity and reliability of Persian version of MIDAS and HIT questionnaires in 240 males and females with a migraine diagnosis according to criteria for headache and facial pain of the International Headache Society (IHS). The patients were enrolled in the study from 3 neurology clinics in Isfahan, Iran, between July 2004 and January 2005 and were evaluated at baseline (visit 1) and 4 weeks later (visit 2).

**Results:** According to our study, there was a high correlation between two tests ( $r = 0.94$ ). This decreased their MIDAS

grade in comparison to their grade HIT questionnaire.

**Conclusion:** These findings demonstrated that Persian version of HIT have the same validity and reliability as MIDAS. Replying to HIT questionnaire was easier than MIDAS for Iranian patients. Physicians can reliably use the Persian translation of both MIDAS and HIT questionnaires to define the severity of illness and its treatment strategy as a self-administered report by migraine patients. However, we recommend HIT for its simplicity in headache clinics.

## Introduction

Migraine is a disorder which is characterized by attacks that vary in frequency, duration, severity and symptomatology.<sup>1</sup> Headache is the most prominent clinical feature of migraine.<sup>2-4</sup> About 80% of patients report pain with an intensity of 7 or more (on a scale where 0 = no pain and 10 = pain as bad as it can be).<sup>5</sup> There is considerable variation in the frequency and duration of migraine attacks both within and between individuals.<sup>6</sup>

The health-related quality of life (HRQoL) of migraine sufferers is impaired in all samples.<sup>7-10</sup> Moreover, increasing severity of migraine is accompanied by decreasing HRQoL.<sup>11</sup> The HRQoL of migraine sufferers can be significantly improved by effective treatment.<sup>6,12-14</sup> However, measuring HRQoL is of limited use in general clinical practice.

Migraine causes significant disability during headache attack, which leads to serious effects on patient's quality of life and psychological profile.<sup>15-16</sup> The 2001 statistical annex of world Health Organization (WHO), disability-adjusted life years (DALY), which is referred to as an important indicator of disability, reported migraine as one of the most common disability disorders among all of the non-communicable disease in the world. In the near future, migraine as a disorder per se is expected to achieve a higher position with regard to DALY's new order of scoring.<sup>17</sup> Therefore, assessment of the disability of the patients with migraine is the cornerstone for physicians to define treatment needs and strategies.

A method of standardizing clinical information about migraine is essential for coordinated, logical and systematic care. The impact of migraine on the patient is an important clinical parameter but one that is seldom inquired about, perhaps because it exhibits such marked variability among and within individuals.<sup>18</sup>

The Migraine Disability Assessment (MIDAS) questionnaire is a brief, self-administered questionnaire designed to quantify headache-related disability in the past 3-month.<sup>19</sup> Disability from migraine can be measured as the time lasts and interferes with paid work, household-work, school and family time and social and leisure activities.<sup>20</sup> Headache-related disabilities affect most aspects of daily life, including employment, household work, and non-work activities.<sup>20</sup>

Some studies assessed the ease of use and scoring, internal consistency and test-retest reliability, accuracy and validity of MIDAS. They concluded that MIDAS provides and intuitive means of representing headache-related disability for use in clinical practice.<sup>21</sup>

Among other disability measures, the Headache Impact Test (HIT) is frequently used.<sup>22</sup> The 6-item HIT (HIT-6) was recently developed and validated and is available.<sup>23</sup> HIT is a tool to measure the impact headache has on a person's ability to function at work, at school and in social situation.<sup>24</sup> However, HIT (unlike MIDAS) has not yet been shown to be sensitive outcome measure.<sup>24</sup>

MIDAS and HIT were translated to Persian to provide the questionnaire for the benefit of patients with migraine in Iranian daily clinical practice. The aim of this study was to compare validity and reliability of MIDAS and HIT in Iranian patients with migraine-induced headache according to International Headache Society (IHS) criteria.

## Materials and Methods

This study was designed as a multicenter, descriptive study to compare the validity and reliability of Iranian version of MIDAS and HIT questionnaires that has been confirmed by neuroscience research center of Isfahan University of Medical Sciences. A total of 240 patients (male and female) aged 15 to 55 years, with a migraine diagnosis according to

criteria for headache and facial pain that was developed by the classification committee of the International Headache Society (IHS) in 1988<sup>25</sup> and revised in 2004.<sup>26</sup> The patients were enrolled in the study from 3 neurology clinics in Isfahan (Iran) between July 2009 and January 2011.

After the baseline evaluation which included recording of socio-demographic and headache characteristics and severity of disease for the last 3 months, patients were assessed at 4 weeks later for severity of disease since the previous visit. The severity of headache was assessed in a point scale (0 = no pain, 10 = pain as bad as it can be). Patients were asked to complete the MIDAS and HIT questionnaire by themselves at the baseline and follow-up visit. In each visit, a physician that was unaware of patients' results completed both questionnaires.

The MIDAS score was derived as the sum of missed days due to a headache from paid work or household work. The productivity was reduced by at least half (sum of responses to questions 1 to 5). Two additional questions of the MIDAS questionnaire were not included in MIDAS score. The 4-point grading system for the MIDAS questionnaire was as follows: grade 1 (scores ranging from 0 to 5) as little or no disability; grade 2 (score ranging from 6 to 10) as mild disability; grade 3 (scores ranging from 11 to 20) moderate disability and finally, grade 4 ( $\geq 21$ ) as severe disability.<sup>27-28</sup>

The HIT score derived as the sum of scoring answers of 6 questions, the 4-point grading system for the HIT questionnaire is as follows: grade 1 ( $< 49$ ), grade 2 (50-55), grade 3 (56-59) and grade 4 ( $> 60$ ). The severity of HIT was the same as MIDAS.

All patients were also asked to answer the comprehensibility between MIDAS and HIT questionnaire forms. The correlation between the patient's MIDAS and HIT scores and the corresponding total physician-applied scores was analyzed to assess the patients-physician reliability of the questionnaire.

For test-retest reliability assessment, the correlation of MIDAS and HIT scores of all patients at visit 1 and 2 was investigated. The 4-week duration between visits 1 and 2 was accepted as a period short enough to eliminate the likelihood of significant changes in the severity of the disease and long enough for the patients not to recall their answers to the questionnaire they completed at visit 1. The validity of MIDAS was assessed using correlation between total MIDAS scores and the number of days with headache during the period between visits 1 and 2 as an indicator of disability due to migraine. The validity and reliability of HIT was compared with MIDAS grading.

## Statistical Analysis

Since major parameters of the study did not exhibit characteristics of normal distribution, non-parametric methods were used in the analysis of the data. Wilcoxon

signed rank test was performed to compare between visits and two tests. The correlation between study parameters to determine test-retest reliability and validity analysis was defined by the Spearman correlation method and was given as Spearman correlation coefficients.

## Results

A total of 240 patients (220 females and 20 males) were enrolled in the study from 3 neurology clinics in Isfahan, Iran. Of 240 patients, 16 patients were less than 20 years, 172 patients aged between 21 to 40 years and 52 patients more than 40 years.

Information about the two tests as well as other data about socio-demographic and headache frequencies (1 to few per day, 1 to 6 per week, or 1 to 3 per month) were evaluated in two visits by questionnaires. Headache characteristics of patients in two visits are summarized in tables 1 and 2. Questionnaires were fully illustrated for all patients. More than 90 percent (93.3%) of patients preferred HIT in comparison with MIDAS for facility and practicality.

Correlation between MIDAS and HIT scores by the physician and patients was increased from visit 1 to 2. This difference was apparent by MIDAS scores. The total median of MIDAS scores was 24 days by physician and 19 days by patients. There was no significant difference between physicians and patients total MIDAS and HIT grading and a highly positive correlation was found in between two tests ( $r > 0.8$ ).

Test-retest reliability and validity were assessed in 2 visits. It was observed that the severity of disease changed significantly after visit 1 regarding the number of days with headache and the duration and severity of headache. Therefore, test-retest reliability was tested in subgroups consisting of patients with 3 days or less change in the number of days with headache at visit 2 compared to visit 1.

The total score and the number of days with headache were positively correlated at each visit ( $r = 0.65$ ).

There was 76.6% similarity between two tests and there was no significantly difference between MIDAS and HIT scores in two visits ( $P < 0.05$ ) and a highly positive correlation was found in two tests ( $r = 0.94$ ,  $P < 0.001$ ).

## Discussion

In the present study, the reliability and validity of Persian translation of MIDAS was compared with HIT in a clinical-based population. Correlation analysis between the scores of MIDAS and HIT applied by the physician and the patients showed a high correlation.

The most frequently used instrument in migraine research to measure disability is the MIDAS questionnaire.<sup>29</sup> The Disability Strategies of Care (DISC) study proved that the MIDAS is useful for stratifying patients to therapy.<sup>30</sup>

The test-retest reliability of the overall MIDAS score was approximately 0.8 in the US and UK.<sup>21</sup> The studies described here show that the MIDAS questionnaire is brief and easy to complete and exhibit high test-retest reliability<sup>29,31</sup> and good validity.<sup>19</sup>

The HIT-6 was recently developed and validated and had good internal consistency and test-retest reliability (0.83). For the individual questions, the Pearson correlation coefficients ranged from 0.6 to 0.71.<sup>22</sup> In the Internet Study, HIT-6 score was stable, with 77.6% of respondents showing no significant change in score in two more measurement.<sup>32</sup>

In our study, we demonstrated high correlation between two tests ( $r = 0.94$ ). There was high comprehensibility of 2 tests; meanwhile, HIT was more practical and simpler than MIDAS for Iranian patients.

According to our data, the frequency of grade 4 in HIT

**Table 1.** Headache characteristics of patients based on Migraine Disability Assessment questionnaire

	Severity of headache			Attack rate		
	Visits 1/2			n (%)		
	0-5	6-8	9-10	1-3/day	1-6/week	1-3/month
Grade 1	12/10	8/9	-/1	-	-	20 (25%)
Grade 2	4/3	8/10	4/3	-	-	16 (20%)
Grade 3	8/6	24/20	12/8	12 (23%)	20 (18.5%)	12 (15%)
Grade 4	12/10	68/14	80/86	40 (77%)	88 (81.4%)	32 (40%)

**Table 2.** Headache characteristic of patients in Headache Impact Test

	Severity of headache			Attack rate		
	Visits 1/2			n (%)		
	0-5	6-8	9-10	1-3/day	1-6/week	1-3/month
Grade 1	8/7	-/1	-/-	-	-	8 (10%)
Grade 2	4/-	4/-	-/-	-	-	8 (10%)
Grade 3	8/6	16/17	4/5	4 (7.6%)	8 (7.4%)	16 (20%)
Grade 4	16/14	88/85	92/97	48 (92.3%)	100 (92.5%)	48 (60%)

was more than MIDAS. Probably, this difference stems from higher number of housekeepers in Iranian population that could not reply to the first and second question of MIDAS test resulting in decreased MIDAS grade in proportion compared to HIT.

In conclusion the finding of this study demonstrated that both MIDAS and HIT questionnaires are equivalent in terms of test-retest reliability and validity and they are applicable as a patient-administered self-report. 93.4% of patients said that replying to HIT questionnaire was easier than MIDAS. We recommend Persian version of HIT in

rapid evaluation of migraines patients in all clinics to facilitate the treatment decision and migraine care.

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### Conflict of interest

The authors have no conflict of interest.

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