MEDICAL SCIENCE

Assessing disability and quality of life among migraine patients: A single center study using MIDAS and SF-36 questionnaires in Jeddah, Saudi Arabia

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ABSTRACT

Background: Migraine is characterized by painful headaches lasting 4-27 hours and accompanied by nausea and disturbed vision. It is considered the seventh major factor for living with disability. *Aim*: This study aims to assess quality-of-life (QoL) impairment and disability among chronic migraine patients in King Abdulaziz Medical City, Jeddah, Saudi Arabia. *Methods*: A descriptive cross-sectional survey was conducted from October to December 2022. Data was collected through phone interviews using: The Short Form-36 (SF-36) and Migraine Disability Assessment (MIDAS). *Results*: 103 out of 202 patients were already diagnosed with migraine, with 64.1% being females. The mean age of participants was 36.7 years. Significantly, there was a negative association between MIDAS and QoL components except for the limitation of emotional problems (P=0.063), whereas the highest negative correlation was overall QoL (r-0.487). Females had the lowest QoL scale (P=0.001). There were no notable variations in QoL by age category (P=0.621) and educational level (P=0.085). *Conclusion:* The results highlight the essential of monitoring QoL domains as an important factor in managing migraine patients to minimize the disability it imposes on their everyday life.

Keywords: Migraine, Disability, Quality of life, MIDAS, SF-36, Saudi Arabia

1. INTRODUCTION

The second-most prevalent headache disorder is migraine. It is a complex neurological disease characterized by episodes of painful headaches lasting 4-

27 hours (Dayapogu and Yildiz, 2017; Albadrani et al., 2023). These episodes consist of a throbbing unilateral or bilateral headache, which is usually accompanied by nausea and disturbed vision. The most reported manifestations of migraine headaches were photophobia (94.6%), limitation of activity (83.0%) and nausea (76.0%) (Bamalan et al., 2021). While sleep deprivation (94%), stress and anxiety (81.6%) and sounds (78.7%) were frequently reported to be the most common triggers. Both Chronic and episodic migraines have an adverse effect on the life of patients. Frequent episodes of migraine may negatively affect multiple aspects of patients' social and personal lives, thus decreasing their quality of life (Bamalan et al., 2021).

The worldwide prevalence of patients diagnosed with migraine is reported to be between 2.6% and 21.7%, 85% of whom are women, who experience chronic daily headaches (Dayapogu and Yildiz, 2017). Jeddah, Saudi Arabia, the city in which this study was conducted, 37.2% of people in the population were found to have migraine headaches, with females having a greater frequency (81.1%) with the highest prevalence being observed in students (43.3%) (Bamalan et al., 2021). In 2015, the Global Burden of Diseases study rated migraine as the seventh most common reason for years spent living with disabilities (YLD) in general and the first leading cause of YLD in people under 50 years (Leonardi and Raggi, 2019).

Migraine affects both individuals and communities. On the individual level, it affects personal suffering (Raggi et al., 2013). 50% to 73% of migraine patients reported that their migraines have led to impaired functioning and on the community level, patients reported that their migraines have led to significant financial burden on their daily lives and relationships. Reports show that migraines can even affect patients' lives during periods between each episode due to their fears and worries regarding when the next episode might present (Al-Harbi and Al-Ateeq, 2020).

The financial costs are considered a significant burden for many countries. The average healthcare cost for every patient with episodic migraine is estimated to be more than 2600 US dollars and 8000 US dollars for those with recurrent migraine annually (Bamalan et al., 2021). The impact of migraines on patients can be assessed by a multitude of assessment methods. One approach is to measure the disability caused by migraines. An often-used disease-specific tool to assess for it is called the Migraine Disability Assessment questionnaire (MIDAS). It takes into consideration migraines' consequences for housework, social life, work and the frequency as well as the intensity of the attacks (Dowson, 2001).

Although the MIDAS is a practical test for measuring disease-specific disability, it lacks the ability to measure the health-Related Quality of Life aspects (HRQoL), specifically in the physical, mental and other social domains (Leonardi et al., 2010). For this reason, the MIDAS should be used alongside a HRQoL instrument to fully understand the impact of chronic Migraine on patients. The most often used generic HRQoL instrument is called the 36-Item Short-Form Health Survey (SF-36). It is a questionnaire containing 36 questions covering 8 domains of quality of life including physical functioning, role limitations, bodily pain, vitality, overall well-being, social interaction, emotional limitations and mental health. Combining both the MIDAS and SF-36 will lead to a better more comprehensive outlook on the morbidity of chronic Migraine patients (Fuh and Wang, 2006).

Migraine and its complications negatively affect patients' quality of life in many aspects. Most migraine patients encounter physical and mental impairment in their life (Bamalan et al., 2021; Basardah et al., 2022). There are two types of questionnaires used in this study, the 36-Item Short-Form Health Survey (SF-36) to assess migraine patients' quality of life and the Migraine Disability Assessment (MIDAS) to assess disability. Hence, we had a broad spectrum and comprehensive look at comorbidities and disabilities of migraine by combining these two assessment tools (Fuh and Wang, 2006).

In Saudi Arabia, there is insufficient amount of data on the level of well-being and disability in migraine patients. Therefore, this study seeks to evaluate the quality-of-life impairment and disability among chronic migraine patients by using MIDAS and SF-36 in King Abdulaziz medical city Jeddah.

2. MATERIALS AND METHODS

The study was a single-center questionnaire-based cross-sectional descriptive study conducted on migraine patients followed at King Abdulaziz Medical City in Jeddah from October to December 2022. The inclusion criteria were all patients diagnosed and currently suffering from migraine with or without aura and age above 18. Any patients with disabling chronic disease or psychiatric illness were excluded. The sample size relied on the listed, already diagnosed and currently following up migraine patients at King Abdulaziz Medical City's health system. Only 103 participants from the 202 listed diagnoses agreed to participate in this study.

Through phone call interviews, patients were first asked two questions to differentiate between those with comorbid chronic and psychiatric illnesses from those with migraine only and to screen for the exclusion criteria. Then they were invited to complete two patient-reported outcome measures: SF-36 and MIDAS. The SF-36 is an instrument that measures HRQoL aspects through questions that cover, concerning the previous month, eight general health concepts regarding physical and mental status: Physical Functioning, Role Physical, body aches, vitality, overall well-being, social interaction, emotional limitations, Mental Health.

Physical Composite Score and Mental Composite Score are the principal scores summarizing the mentioned scales. Which range from 0-100, the higher the better HRQoL. This questionnaire is a free domain survey developed and translated into Arabic by the RAND Corporation (Al-Abdulmohsin et al., 1997). The other tool is MIDAS which is a migraine-specific tool, unlike SF-36. MIDAS is used to define patients' severity profiles through 5 questions that cover different domains to investigate the influence of headaches throughout the preceding three months.

The domains that will be covered in MIDAS are: Paid and school work, household work, leisure activities with family, in social situations, the mean pain intensity and the total number of days with migraine attacks. The grading of the calculated scores is divided into four categories according to MIDAS: Minimal (0-5), mild (6-10), moderate (11-20) and severe (>21) conditions. We used the validated Arabic version of the Migraine-Specific QOL Questionnaire, version 2.1 (MSQ 2.1). MSQ 2.1 was obtained from the Mapi Research Trust website, which had permission from the developer for the translation and use of the questionnaire (Mourad et al., 2019). The accuracy and consistency of the English version had been tested in many studies.

The conduct of this study was ethically approved by the Institutional Review Board of King Abdullah International Medical Research Center and consent was taken from all participants during the interview. No identifying data such as names or IDs were taken from the participants. Participants' responses were identified with assigned numbers only. Participants' information was kept secured and password-protected and only the authors will have access to the information.

Methods of analysis

Data collected was stored, prepared and coded in Excel sheets prior to the data analysis process. SPSS version 25, software was used to analyze the data. Categorical variables were presented in frequencies and percentages, while quantitative scale variables were described by measures of descriptive statistics including mean, SD, range and IQR. Significant differences in study scales were examined using a t-test for independent groups and ANOVA. The correlation between MIDAS and QoL scales was examined by the linear correlation coefficient. A p-value of lower or equivalent to 0.05 was considered significant.

3. RESULTS

Table 1 shows the basic frequency and percentage distribution of the basic characteristics of participants. Out of 103 patients, 64.1% were females; the majority was aged less than 40 years with a mean of 36.73 years. Most of participants had secondary and bachelor level of education.

Table 1 Basic characteristics of participants

Variable	N=103	%
Gender		
Male	37	35.9
Female	66	64.1
Age		
Less 40	65	63.1
40-49	25	24.3
50+	13	12.6
Education		
Primary	15	14.6
Intermediate	8	7.8
Secondary	38	36.9
Bachelor	35	34.0
Master	5	4.9
PhD	2	1.9

Table 2 presents the mean and SD of the components of the QoL sub scales, physical health had the highest mean scores (64.6). Energy and emotional well-being had the lowest QoL mean scores, 43.2 and 44.2 respectively. The overall SF QoL mean score was 51.4 with 17.3 SD. MIDAS score measures is in Table 3, minimum and maximum values of the scale were 0 and 242. The mean score was calculated at 38.3 and the IQR was 26.0.

Table 2 SF 36 QoL sub scales

Sub scale	Mean	SD
Physical functioning	64.6	29.7
Limitation physical health	47.8	43.8
Limitation emotional problems	64.1	46.1
Energy	43.2	21.5
Emotional well being	44.2	15.2
Social functioning	47.1	23.3
Pain	45.6	28.5
General health	53.8	13.2
Overall score	51.4	17.3

Table 3 Basic measures of MIDAS, absence days and low productivity days

Variable	Min	Max	Mean	Median	SD	Range	IQR
MIDAS	0	242	38.3	23.0	46.4	242.0	26.0
Absence	0	36.0	1.3	0	4.2	36.0	0
Low	0	36.0	2.8	0	6.5	36.0	3.0

Table 4 Basic characteristics of participants by overall QoL Scale

Variable	Mean	SD	P value
Gender			
Male	58.6	12.7	0.001
Female	47.3	18.2	
Age			
Less 40	52.6	16.8	0.621
40-49	50.1	16.8	
50+	47.9	21.2	
Education			
Secondary and less	48.9	17.7	0.085
Bachelor and above	54.9	16.1	

In Table 4, Overall QoL score was examined by the basic characteristics of participants using t test for independent samples and ANOVA. Significant difference in overall QoL score was found among participants, both male and female, (P-value 0.001), the mean of overall QoL for males was 58.6 compared to 47.3 for females. QoL did not differ significantly by age categories of patients (P-value 0.621). The results revealed non-significant difference in QoL score by educational level of participants (P-value 0.085).

Table 5 Correlation between MIDAS score and QoL dimensions

QoL Scale	Correlation	P value
Physical functioning	-0.364	0.001
Limitation physical health	-0.278	0.005
Limitation emotional problems	-0.184	0.063
Energy	-0.316	0.001
Emotional well being	-0.355	0.001
Social functioning	-0.422	0.001
Pain	-0.357	0.001
General health	-0.276	0.005
Overall score	-0.487	0.001

Correlation analysis of MIDAS score and QoL sub scales was in (Table 5). The results showed a significant and negative correlation between MIDAS scale and all components of QoL scale except for the limitation emotional problems (P-value 0.063). The highest negative association was noticed between the MIDAS scale and the overall QoL scale (r -0.487) followed by the correlation of MIDAS with social functioning (r -0.422). The lowest correlation of MIDAS score was found with general health scale (r -0.276) and limitation physical health score (r -0.278).

4. DISCUSSION

Chronic migraine has been a significant burden to individuals and communities worldwide. It is considered a leading cause of years lives with a disability (YLD) among people under fifty years of age (Leonardi et al., 2010). This study aimed at assessing the quality-of-life impairment and disability among chronic migraine patients by using MIDAS and SF-36 in King Abdulaziz medical city Jeddah. Our findings suggest that patients with chronic migraine have disabilities and impaired quality of life in many aspects, especially in physical activity, low productivity and absenteeism. Moreover, our migraine patients are found to have significant relationships between disability and quality of life.

The study demonstrates a significant and negative correlation between MIDAS scale and all components of QoL scale except for the limitation of emotional problems. The highest negative association was discovered between the MIDAS scale and the overall QoL scale followed by the correlation of MIDAS with social functioning. The lowest correlation of MIDAS score was found with general health scale and limitation physical health score. According to MIDAS score, our participants had a mean of 38.3 which indicates it as severe disability grade IV, corresponds to a MIDAS score of 21 or more. Therefore, the results show that participants have been affected by migraine during working days which lead to low productivity days during work and absenteeism.

While according to SF-36 QoL, the analysis confirms that there is a significant decrease in physical functioning, limitation emotional problems and general health among chronic migraine patients. However, energy and emotional well-being had the lowest correlation with our participants. Also, the data suggest male and female individuals differed significantly with females having the lowest QoL scale compared to males, whereas there are no significant differences in QoL score by age category and educational level.

Our findings are Similar to what was reported by previous study, the MIDAS score in their study was relatively high (79.2, SD=64.3) although our mean and SD are slightly less it is also considered as grade IV severe disability. Similarly, female patients are more susceptible than males to disability and impaired quality of life when dealing with chronic migraine (Al-Ghadeer et al., 2021; Leonardi et al., 2010). Domestic and social activities significantly impaired most chronic migraine patients and then a significant reduction in work performance.

In our study, however, most domains of MIDAS were low productivity days during work and absence respectively. While using SF-36 to assess health-related quality of life, their participants had significant decreases in role functioning and general health. However, a decrease in physical functioning, limitation of emotional problems and decrease in general health were found in our result (Leonardi et al., 2010). Also, our results are in contrast with those reported by Al-Ghadeer et al., (2021) regarding the association between migraine disability assessment MIDAS and HrQoL SF-36.

They only had a significant correlation between severe MIDAS scores and patients' emotional function. On the other hand, our results showed a significant and negative correlation between the MIDAS scale and all components of the QoL scale of SF-36 except for the limitation of emotional problems. These results build on existing evidence of chronic migraineurs having impaired aspects of their life that would reach disability to some degree. Chronic migraine patients got affected by their daily activity due to migraine attacks, such as decreasing productivity during work or house work. Also, it may lead to being absent for a few days due to a severe attack. Moreover, because of severe migraine attacks, patients are forced to miss some important social or family meetings. In addition, chronic migraine harms one's general health, physical functioning, emotional and social well-being.

Limitations

There are potential limitations to this study. Because it is a cross-sectional design, it means that no controls were used which would represent more significant results. Moreover, the number of sample size, inability to take comorbidities into account and insufficient randomization consider other limitations to our study. Additionally, the time from diagnosis to treatment, frequency and migraine attacks duration were not taken into consideration.

5. CONCLUSION

Chronic Migraine headaches negatively affect QoL up to 21.7% of the global population. In this study, we assessed the disability and quality of life of migraine patients by measuring patient-oriented outcomes in the SF-36 and MIDAS forms. As stated by the MIDAS score our participant had a mean of 38.3, classifying it as severe disability grade IV. Furthermore, the study demonstrates a significant and negative correlation between MIDAS scale and all components of QoL scale except for the limitation of emotional problems, with the most affected QoL domain being social functioning.

This is contrary to previous findings which show a correlation between severe MIDAS score and patient's emotional function only; this is possibly due to the differing study populations. Our study's findings highlight the importance of monitoring the quality-of-life domains as an important factor in the management of migraine patients, to minimize the disability it imposes on their everyday life. There is a need to further studies in the form of randomized control trials, to evaluate the effectiveness of using quality-of-life measures as a goal for therapy in migraine patients and confirm our findings.

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Authors' contributions

All authors made substantial contributions to the paper and contributed equally in manuscript work & production.

Ethical consideration

Ethical approval from Institutional Review Board (IRB) of King Abdullah International Medical Research Center (IRB/1850/22, NRJ22J/187/07) was met before data collection began and the purpose of the study was clearly explained to the participants. They are assured that data from this study will be used for scientific purposes only, that ethical concerns and legal issues were considered and that participation is completely voluntary. Also, informed consent was obtained from all individual participants included in the study.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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