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Quality of life and its predictors among patients with migraine in Qassim region, Saudi Arabia: a cross-sectional study

Sarah Abdulrahman Almosaiteer[1], Unaib Rabbani[2*], Basil Abdulrahman Alharbi[1] and Abdulrhman Aldukhayel[3]

Abstract

Background: Migraine attacks can last for hours to days with severe pain which can affect the daily activities. Literature on quality of life of migraineurs is Saudi Arabia is scarce. This study aimed to assess the quality of life and its predictors among patients with migraine in Qassim region, Saudi Arabia.

Methods: A cross-sectional study was conducted among patients with migraines in Qassim, Saudi Arabia. A self-administered questionnaire was distributed online among migraine patients that included; socio-demographic characteristics and an Arabic version of validated migraine-specific quality of life questionnaire (MSQ), version 2.1. Data analyses were performed in SPSS version 26.

Results: A total of 320 patients with migraines participated in the study. The most common age group was 18–25 years (36.6%) with females were dominant (60.9%). According to the results of MSQ version 2.1, the mean ± SD scores of Role Restrictive (RR), Role Preventive (RP), and Emotion Function (EF) were 67.7 ± 19.7, 68.5 ± 20.6, and 70.6 ± 22.1, respectively. Statistical tests revealed that patients who reported less frequent migraine attacks, had better scores in RR, RP, and EF, while the use of paracetamol and painkillers for the treatment of headache were associated with lower scores in RR, RP, and EF.

Conclusions: The quality of life among patients with migraines was generally moderate. Males demonstrated better QOL than females. Furthermore, patients who had less frequent migraine attacks exhibited better QOL than the others but working patients were likely to demonstrate poor QOL.

Keywords: Headache, Migraine, MSQ, Quality of life, Predictor, Saudi Arabia

Introduction

Migraine is a neurological disease, characterized by pain which is always described as severe and usually associated with nausea and sensitivity to light or voices [1]. Episodes of migraine are associated with moderate to severe pain which is throbbing in nature and may affect a localized area or both the sides of head. The worldwide prevalence of migraine ranges between 2.6 and 21.7% [2–4]. According to the report from the Global Burden of Disease, migraine was considered the 1st leading cause of disability in 2015 among people younger than 50 years of age [5].

Studies have shown that migraine can affect the individual as well as social aspects of a person. A large number of migraine patients perceived negative effects on their relationships [6]. Migrain has also been reported to negatively affect educational, occupational and social performance of individuals [7–9]. There have been investigations into the quality of life (QOL) of migrain patients in different parts of the world and results showed a

*Correspondence: rabbaniunaib@gmail.com
[2] Family Medicine Academy, Qassim Health Cluster, Buraydah, Saudi Arabia
Full list of author information is available at the end of the article

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decline in the quality of life [10–12]. In addition, QOL of Migraineurs was inversely related to attack frequency [13].

The burden of migraine in Saudi Arabia is very high as the prevalence in different studies has been reported to be as high as 27–32% [14, 15]. Literature on quality of life assessment among migrain patients is scarce in middle east specially in Saudi Arabia. A study was conducted in Riyadh showed poor quality of life associated with chronic migraine especially young people and people who have chronic diseases [16]. Another study from Saudi Arabia looked into disability caused by migrain found that about two thirds (68%) of migraine patients had moderate to severe disability [17]. There still exist large gap in the knowledge about the impact of migrain on QOL of the affected individuals. This study, therefore, aimed to assess Quality of life and its predictors among patients with migraine in Qassim region.

Methods

Study design and setting

This was an analytical cross-sectional study, conducted among people with diagnosis of migrain in Al-Qassim region of Saudi Arabia. Qassim region is located in central part of Saudi Arabia with an estimated population of about 14 million.

Study population

Study population for this study include people with diagnosis of migraine in Qassim region of Saudi Arabia.

Sample size

The Sample size was calculated using Statulator online sample size calculator for estimation of population mean [18]. The estimated population of Qassim is around 14 million out of which 75.5% are above the age 15 years. Using these estimates, the expected population of migrainers in Qassim is about 290,000, based on reported prevalence to be 27% among adults [15]. Assuming the expected population standard deviation to be 23.4 [16], and employing t-distribution to estimate sample size, the study would require a sample size of 340 to estimate a mean with 95% confidence and a precision of 2.5.

Sampling technique

Participants in our study were selected by convenience sampling. Survey link was shared on various social media such as Facebook, Twitter and Instagram. Recipients were asked to open the link only if they were resident of Qassim region and had been diagnosed by a neurologist to have migrain. Adult Saudi nationals of either gender, living in Qassim region and diagnosed with migraine were eligible to participate. Anyone meeting the preceding criteria but have been diagnosed with psychological disorder and taking treatment for the same was excluded.

Data collection methods

The data was collected using a structured questionnaire in Arabic. The first page included the information about the study and eligibility. The questionnaire collected data on socio-demographic variables (age, sex, socioeconomic status). Second part of the questionnaire was Arabic version of the migraine-specific quality of life questionnaire (MSQ), version 2.1 which measured the quality of life of the patients with migraines [19, 20]. Linguistic validation of Arabic translation was by GlaxoSmithKline Research and Development Limited (GSK) [21] and has been used previously in a research conducted in Saudi Arabia [16]. It measures the quality of life among migraine patients during the past 4 weeks. It has three scales assessing three quality of life domains: (1) Role Restrictive (RR, originally named Role Function-Restrictive in MSQv2.1), which includes seven items that assess how patients' performance of normal activities is limited by migraine; (2) Role Preventive (RP, originally named Role Function-Preventive), which consists of four items that assess how patients' performance of normal activities is interrupted by migraines; and (3) Emotion Function (EF), which consists of three items that assess the impact of migraine on the respondent's emotions (e.g., frustration or helplessness). The item responses range from one to six (1 = "None of the time;" 2 = "A little bit of time;" 3 = "Some of the time;" 4 = "A good bit of the time;" 5 = "Most of the time;" 6 = "All of the time"). All items are reverse-coded and standardized to a 0–100 scale. Thus, higher scale scores indicate a better migraine-related quality of life [22]. A pilot study was done to show clarity of data collection questionnaire, which included 10% of sample size and this data was not included in the study.

Statistical analysis

The data analyses were carried out using Statistical Packages for Social Sciences (SPSS) version 26 Armonk, New York, IBM Corporation. Qualitative variables were presented using frequencies and percentages, while quantitative variables were presented using mean and standard deviation. The overall scores of RR, RP, and EF were compared with the socio-demographic characteristics of the patients using Mann Whitney *U*-test and Kruskal Wallis test. Normality tests were performed using the Shapiro Wilk test. The scores of total mean scores of RR, RP, and EF were deemed as not-normally distributed. Thus nonparametric tests were applied. A *P*-value of 0.05 was considered statistically significant.

Ethical considerations

The ethical approval was obtained from Committee of Research Ethics, Deanship of Scientific Research, Qassim University. Informed consent was taken from each participant. Confidentiality of the participants was ensured.

Results

This study involved 320 patients with migraine. As described in Table 1, the most common age group was 18–25 years (36.6%) with approximately 61% were females. Near two thirds (62.5%) had university degrees and 41.6% were employed. The prevalence of smoking was 23.1%. Furthermore, 30.3% has been suffering from migraine for less than a year and 29.1% indicated 1–2 years of having a migraine. Similarly, 32.2% of the patients had a frequency of migraine attacks 1–2 times per month with 42.2% were using paracetamol for the treatment of headache. On the other hand, for the treatment of migraine, the most common preventive medication being used was propranolol (10.6%) and amitriptyline (10%). In addition, the proportion of patients who were suffering from chronic diseases was 26.6%. The most commonly mentioned chronic diseases were; diabetes (37.6%), followed by hypertension (30.6%).

The quality of life scores of individual items and domains are presented in Table 2. It was shown that in the role function restrictive subscale, better RR can be seen in the statement of "How often have migraines interfered with how well you dealt with family, friends and others who are close to you?" (mean: 4.29). The overall mean score of RR was 67.7 (SD 19.7). For the Role function preventive subscale, better RP can be seen in the statement of "How often did you need help in handling routine tasks such as everyday household chores, doing necessary business, shopping, or caring for others, when you had a migraine?" (mean: 4.19). The total mean score of RP domain was 68.5 (SD 20.6). Finally, for the emotional function subscale, better EF was observed in the statement of "How often have you been afraid of letting others down because of your migraines?" (mean: 4.39). The total mean score of EF was 70.6 (SD 22.1).

When measuring the differences in the scores of RR, RP, and EF in relation to the socio-demographic characteristics of the patients, it was found that patients who were employed showed significantly lower mean scores in RR ($Z = -2.987$; $p = 0.003$) and RP ($Z = -2.639$; $p = 0.008$). It was also observed that patients who were smokers showed significantly lower mean score in RP ($Z = -2.127$; $p = 0.033$). Furthermore, patients who had migraine attacks of fewer than 12 times a year, exhibited significantly better scores in RR ($Z = 30.512$; $p < 0.001$), RP ($Z = 28.833$; $p < 0.001$), and EF ($Z = 34.306$; $p < 0.001$).

Table 1 Socio-demographic characteristics of the patients ($n = 320$)

Study variables	*N* (%)
Age in years	
18–25 years	117 (36.6%)
26–30 years	85 (26.6%)
31–40 years	82 (25.6%)
> 40 years	36 (11.2%)
Gender	
Male	125 (39.1%)
Female	195 (60.9%)
Educational level	
Illiterate	03 (0.90%)
Primary	09 (02.8%)
Secondary	81 (25.3%)
University degree	200 (62.5%)
Postgraduate	27 (08.5%)
Employed	
Yes	133 (41.6%)
No	187 (58.4%)
Smoking	
Yes	74 (23.1%)
No	246 (76.9%)
How long have you been diagnosed with migraine headaches?	
< 1 year	97 (30.2%)
1–2 years	93 (29.1%)
3–5 years	60 (18.8%)
> 5 years	70 (21.9%)
How often do you have migraine attacks?	
< 12 times a year	76 (23.8%)
1–4 times per month	103 (32.2%)
1–3 times per week	90 (28.1%)
Daily or almost daily	51 (15.9%)
Medication used when having a headache	
Paracetamol	135 (42.2%)
Strong painkillers	87 (27.2%)
Paracetamol and painkillers	51 (15.9%)
Triptan derivatives and nausea medications	44 (13.8%)
Others	03 (0.90%)
Preventive medication for the treatment of migraine	
I don't use preventive medication	172 (53.8%)
Topamax	30 (09.4%)
Amitriptyline	32 (10.0%)
Propranolol	34 (10.6%)
Tegretol	11 (03.4%)
Others	03 (0.90%)
I use preventive medicine but I don't know its name or I don't remember it	38 (11.9%)
Do you suffer from chronic diseases	
Yes	85 (26.6%)
No	235 (73.4%)

Table 2 Assessment of Migraine-Specific Quality of Life Questionnaire (MSQ).[(n=320)]

In the past 4 weeks	Mean ± SD
1.How often have migraines interfered with how well you dealt with family, friends, and others who are close to you?	4.29 ± 1.35
2.How often have migraines interfered with your leisure time activities, such as reading or exercising?	4.07 ± 1.44
3.How often have you had difficulty in performing work or daily activities because of migraine symptoms?	3.94 ± 1.50
4.How often did migraines keep you from getting as much done at work or at home?	4.07 ± 1.51
5.In the past 4 weeks, how often did migraines limit your ability to concentrate on work or daily activities?	4.03 ± 1.47
6.How often have migraines left you too tired to do work or daily activities?	4.02 ± 1.47
7.How often have migraines limited the number of days you have felt energetic?	4.01 ± 1.48
*Role Function Restrictive (RR)**	67.7 ± 19.7
8.How often have you had to cancel work or daily activities because you had a migraine?	4.17 ± 1.45
9.How often did you need help in handling routine tasks such as everyday household chores, doing necessary business, shopping, or caring for others, when you had a migraine?	4.19 ± 1.41
10.How often did you have to stop work or daily activities to deal with migraine symptoms?	4.09 ± 1.42
11.How often were you not able to go to social activities such as parties, dinner with friends, because you had a migraine?	3.99 ± 1.54
*Role-Function Preventive (RP) **	68.5 ± 20.6
12.How often have you felt fed up or frustrated because of your migraines?	4.05 ± 1.58
13.How often have you felt like you were a burden on others because of your migraines?	4.25 ± 1.56
14.How often have you been afraid of letting others down because of your migraines?	4.39 ± 1.50
Emotional Function (EF)*	70.6 ± 22.1

*Total score of role function restrictive, role function preventive, and emotional function were rescaled from 0 to 100 scale such that higher scores indicate better quality of life

On the other hand, patients who were taking paracetamol and painkillers for the treatment of headaches exhibited significantly lower mean scores in RR ($Z = -17.569$; $p = 0.001$), RP ($Z = 9.184$; $p = 0.027$), and EF ($Z = 17.088$; $p = 0.001$). In addition, patients who were taking preventive medication for the treatment of migraine were more associated with better mean scores in RR ($Z = -3.230$; $p = 0.001$) and RP ($Z = -2.476$; $p = 0.013$) but less in EF ($Z = -2.979$; $p = 0.003$). We did not find any difference in QOL with respect to age, gender, education, time since diagnosis of migraine and presence of chronic disease (Table 3).

Discussion

The present study attempted to evaluate the quality of life among patients with migraines and determine the factors associated with it. In this study, we measured patients' quality of life using migraine-specific quality of life questionnaire (MSQ), version 2.1. Based on our findings, the overall mean (SD) scores of RR, RP, and EF score were 67.7 (SD 19.7), 68.5 (SD 20.6), and 70.6 (SD 22.1), respectively, with an overall mean MSQ score of 68.9. This result is consistent with Pradeep et al. [23]. They found that, the overall mean score of MSQoL was 69.8 (SD 14.7). On the other hand, our results are better when compared to another study, conducted in Riyadh, Saudi Arabia [16]. According to their findings, the overall mean scores of RR, RP, and EF were; 51.8, 54, and 46.3, respectively, which are lower than our study. The possible reason for better QOL scores in our study compared to Riyadh, could be the study setting. We recruited participants from general population, while the later recruited from a neurology clinic, where it is likely that people with more severe disease were included. This is also reflected in our results as 56% of participants in our study were of low-frequent attacks of migraine. Another study from Malaysia, used the World Health Organization Quality of Life Instrument (WHOQOL-BREF) questionnaire. It was found that the patients with migraine experienced significantly lower QOL [12]. They further reported that, 73% experienced a severe disability, with a significantly higher number of days with headaches and pain scores.

It is important to note that the most commonly used medication for the immediate treatment of migraine was paracetamol (42.2%), followed by strong painkillers (27.2%) with 15.9% were using a combination of paracetamol and painkillers. Furthermore, the most commonly used preventive medication for migraines was propranolol (10.6%) and amitriptyline (10%). These reports corroborated with the paper of AlHarbi and colleagues [16]. They reported that the most commonly used medication for the treatment of headache was paracetamol, while amitriptyline had been used for preventive therapy of migraine. In our study, more than half (53.8%) were not using preventive medication for the treatment of migraine which was higher than previous reports [16].

Various socio-demographic and health related characteristics have been reported to be associated with QOL

Table 3 Difference in the migraine-quality of life with respect to the socio-demographic characteristics of the patients (*n*=320)

Factor	RR score Mean ± SD	RP score Mean ± SD	EF score Mean ± SD
Age in years [a]			
≤ 30 years	69.0 ± 19.5	69.9 ± 20.2	70.8 ± 22.6
> 30 years	65.5 ± 20.4	66.2 ± 21.1	70.2 ± 21.2
Z-score; *p*-value	− 1.366; 0.172	− 1.463; 0.144	− 0.449; 0.654
Gender[a]			
Male	69.1 ± 20.1	71.0 ± 19.4	71.8 ± 21.4
Female	66.8 ± 19.7	66.9 ± 21.2	69.8 ± 22.5
Z-score; *p*-value	− 1.067; 0.286	− 1.584; 0.113	− 0.794; 0.427
Educational level [a]			
Secondary or below	67.2 ± 20.2	68.9 ± 21.8	68.0 ± 21.8
University degree or higher	67.9 ± 19.8	68.4 ± 20.1	71.6 ± 21.8
Z-score; *p*-value	− 0.126; 0.900	− 0.475; 0.635	− 0.899; 0.369
Employed [a]			
Yes	63.8 ± 20.3	65.1 ± 20.9	68.3 ± 21.4
No	70.5 ± 19.1	70.9 ± 20.0	72.1 ± 22.5
Z-score; *p*-value	− 2.987; 0.003 **	− 2.639; 0.008 **	− 1.752; 0.080
Smoking [a]			
Yes	65.2 ± 17.3	64.9 ± 17.5	67.5 ± 22.1
No	68.5 ± 20.5	69.6 ± 21.4	71.5 ± 22.0
Z-score; *p*-value	− 1.308; 0.191	− 2.127; 0.033 **	− 1.499; 0.134
How long have you been diagnosed with migraine headaches?[a]			
≤ 2 years	69.0 ± 18.4	69.6 ± 19.5	70.5 ± 21.7
> 2 years	65.8 ± 21.7	66.9 ± 22.1	70.7 ± 22.8
Z-score; *p*-value	− 1.092; 0.275	− 0.681; 0.496	− 0.008; 0.994
How often do you have migraine attacks? [b]			
< 12 times a year	77.9 ± 20.8	77.2 ± 22.1	81.9 ± 19.9
1–4 times per month	66.9 ± 17.4	69.7 ± 18.9	71.1 ± 21.9
1–3 times per week	63.8 ± 15.4	63.2 ± 17.1	65.5 ± 19.6
Daily or almost daily	61.1 ± 24.5	62.5 ± 22.6	61.4 ± 22.9
H-test; *p*-value	30.512; < 0.001 **	28.833; < 0.001**	34.306; < 0.001**
Medication used when having headache[b]			
Paracetamol	71.3 ± 20.4	71.7 ± 21.5	74.7 ± 22.1
Strong painkillers	62.7 ± 18.8	65.4 ± 18.9	65.8 ± 21.3
Paracetamol and painkillers	61.5 ± 17.9	63.7 ± 18.4	63.1 ± 21.7
Triptan derivatives/nausea medications/Others	73.6 ± 18.7	70.5 ± 21.9	75.5 ± 20.6
H-test; *p*-value	17.569; 0.001**	9.184; 0.027**	17.088; 0.001**
Use of Preventive medication for the treatment of migraine[a]			
Yes	69.9 ± 19.8	70.2 ± 20.2	69.9 ± 1.8
No	65.8 ± 19.8	67.1 ± 0.9	71.2 ± 22.4
Z-score; *p*-value	− 3.230; 0.001**	− 2.476; 0.013**	− 2.979; 0.003**
Do you suffer from chronic diseases[a]			
Yes	68.3 ± 19.6	65.7 ± 20.5	68.9 ± 22.1
No	67.5 ± 19.9	69.6 ± 20.6	71.2 ± 22.1
Z-score; *p*-value	-0.200; 0.842	-1.477; 0.140	-0.957; 0.339

[a] *P*-value has been calculated using Mann Whiney *U*-test. [b]*P*-value has been calculated using Kruskal Wallis *H*-test

**Significant $p < 0.05$ level

of migraine patients.. In Riyadh, Saudi Arabia, a study indicated that low QOL showed a direct association with young age, long disease duration, frequent migraine attacks, and presence of chronic diseases [16] While in our study, age, duration of disease and presence of chronic diseases showed no significant association with QOL of migraineurs. Conversely, Terwindt et al. [13] documented that significantly more migraineurs had asthma or chronic musculoskeletal pain. In this study gender and educational status showed no effects on QOL which is consistent with findings of a study from Riyadh, Saudi Arabia [16].

A study from USA found that patients with less frequent migraine attacks showed a positive association with good QOL [24]. This had also been validated in our study, as frequent incidents of migraine attacks showed a direct relationship with QOL, where those patients with fewer incidences of migraine attacks exhibited better QOL than the other patients. Smoking was found to be associated with lower QOL scores in RP domain which could be due to fact that smoking can trigger frequent attacks of migrain [25] which can have negative effect on QOL. We found that use of preventive medication was associated with higher QOL in domains of RR and RP, while lower scores in EF domain. Continuous use of medication may affect individuals emotionally which might result in reduction in scores in EF domain of QOL.

This study is one of the few studies from the region to assess the QOL of life of migraineurs in general population. We used a standardized and validated tool to assess the outcome. However, there are certain limitations which should be considered while interpreting the results of this study. Firstly, the participants were recruited online due to which response rate cannot be determined. Secondly, online nature of the study would also affect the representativeness of the sample as younger people are more likely to use social media, compared to elderly which is also reflected in our sample. However, this is least likely to affect the representativeness of migraineur population as previous studies from Saudi Arabia have shown that majority of the migraine patients are less than 40 years of age [16, 26]. Another limitation of our study is ascertainment psychological disorders (for exclusion) was based on participants' report. There is possibility of having some participants with undiagnosed psychological disorders in our sample, which may affect the QOL and thus the association with migrain. However, we assume this to have minimal effects on overall validity of our results as in any population at any given point in time, there are always undiagnosed psychiatric patients and they are considered part of healthly population unless diagnosed. Finally, we were able to recruit 320 participants against the calculated sample size of 340 participants due to time restrictions. However, given the observed standard deviations in our results, the included sample was more than required at 95% confidence level and precision of 2.5. Therefore, this may not affect the accuracy of our results.

Conclusions

The quality of life among patients with migraines was generally moderate. Employment status, frequency of migrain attacks, smoking, type of medication used during attack and preventive medication were significantly associated with QOL scores. These findings are important to identify the high risk groups among migraine patients. In this regard, medical healthcare professionals should conduct a regular QOL evaluation and related disabilities to find out whether patients are getting effective treatment and whether any further treatment is necessary to improve QOL.

Abbreviations

EF: Emotion function; MSQ: Migraine-specific quality of life questionnaire; QOL: Quality of life; RP: Role preventive; RR: Role restrictive; SD: Standard deviation.

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Author contributions

SAA, UR, BAA and AA conceived the idea. BAA and AA conducted literature search. SAA, UR and AA designed and conducted the research. SAA and BAA collected data. SAA and UR analyzed the data. SAA, BAA and UR wrote the initial draft of the article. AA reviewed and edited the draft for publication. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The ethical approval was obtained from Committee of Research Ethics, Deanship of Scientific Research, Qassim University (Approval Number: 20-08-04). Informed consent was taken from each participant.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Author details

[1]College of Medicine, Qassim University, Buraydah, Saudi Arabia. [2]Family Medicine Academy, Qassim Health Cluster, Buraydah, Saudi Arabia. [3]Department of Family and Community Medicine, College of Medicine, Qassim University, Buraydah, Saudi Arabia.

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