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Prevalence of migraine and its effect on the quality of life among the Saudi general population

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ABSTRACT

Background: Migraine is a common episodic neurological condition with complicated pathophysiology that manifests itself as repeating bouts of throbbing and unilateral, frequently severe headaches, nausea, phonophobia, and photophobia. *Objectives:* To determine the prevalence of migraines in Saudi Arabia's general population and their impact on quality of life. *Methods:* This was cross-sectional research based on a broad group of male and female migraine sufferers in Saudi Arabia who were over 18. The research was carried out between June and August of 2021. *Results:* The majority of the participants in this cross-sectional research, 173 (40%), were between 26 and 35. Females (65%) outnumbered males by a margin of (35%). The majority of the participants were jobless Saudis with no prior history of chronic illnesses (191 (44.2%), 376 (87%), and 351 (81.3%), respectively. Age (p-value = 0.046) and gender (p-value = 0.001) were also shown to be substantially linked with migraine attacks. While the MSQ score was associated with living in a city, being single, being a university student, and not having any past chronic conditions (p-value = 0.001, 0.001, 0.046, and 0.001), respectively. *Conclusions:* According to the current study, the total prevalence of migraines in Saudi Arabia's general population was 39.58%. The participants in this study had a significant prevalence of migraines since they were middle-aged females living in southern or metropolitan locations. The most prevalent migraine symptoms were nausea and being bothered by light or loud sounds during a headache attack.

Keywords: Prevalence, Migraine, Quality of Life, Saudi Arabia

1. INTRODUCTION

Migraine is a widespread episodic neurological illness with complex pathogenesis that appears as recurring attacks of generally throbbing and unilateral, often severe headache, accompanied nausea, phonophobia, and photophobia (Lipton et al., 2004). Most migraine attacks begin in the brain, as proposed by (a) the premonitory symptoms (e.g., difficulty with speech and reading, excessive emotionality, sensory hypersensitivity) that occur up to 12 h before the attack in many patients (Giffin et al., 2003), and (b) stress, sleep deprivation, oversleeping, and continuous sensory stimulation are all typical migraine causes (Hauge et al., 2011). Migraine has a global prevalence of more than 10% among people, and current chronic daily headaches have 3%. The prevalence of migraines declines with age. Migraine can lead to chronic daily headaches in certain people (Stovner et al., 2007).

Studies on migraine prevalence range widely, with estimates ranging from 2% to 25% of the adult population; they also vary by sex; age, diagnostic criteria, and community sample (Láinez et al., 2005). The disability caused by migraine attacks is frequently severe, prompting the World Health Organization (WHO) to classify severe migraine as one of the most disabling conditions, alongside quadriplegia, dementia, and psychosis. The unpredictable nature of migraine attacks adds to the significant burden of this disease for impacted patients and their families (Terwindt et al., 2000). Migraines can be serious enough to limit sufferers' activities at home and work. There may be a major psychological impact between attacks, resulting in lost productivity and health-related quality of life (Clarke et al., 1996; Terwindt et al., 2000; Kanjo et al., 2021; Alshehri et al., 2021; Abukanna et al., 2021). Migraine has a measurable impact on both bad quality of life and paid job loss and lower productivity. The burden of migraine and the difficulty in managing it are exacerbated by the comorbid psychological illnesses that occur in conjunction with it.

Studies in both clinical and community-based settings have found a link between migraine and several particular psychiatric diseases, all of which impact health-related quality of life (Hamelsky & Lipton, 2006; Lipton et al., 2003;). Unlike other neurological diseases, the prevalence, diagnosis, treatment, and outcome are not geographically different-migraine is a complicated neurological disease with many location-specific factors that might affect the prognosis. In contrast to industrialized countries, under developed countries have various additional problems, making migraine care considerably challenging (Ravishankar, 2004). Overcoming these roadblocks is more likely to positively impact patient treatment than seeking to evaluate the relative value of one triptan over another. The goal of this study is to determine the prevalence of migraines in Saudi Arabia's general population and their impact on quality of life.

2. METHODOLOGY

Study Design and Setting

This study was a cross-sectional study based in Saudi Arabia.

Study Duration

This study was conducted between June and August 2021.

Population and Sample Size

The study will include the general population of Saudi Arabia, consisting of male and female patients diagnosed with migraines, older than 18 years, Saudi nationality. Patients with psychiatric diseases or disabling chronic illnesses will be excluded. The sample size was obtained using Epi Info STAT CALC version (7.2.4). There are 25,255,166 people over age 18 in Saudi Arabia ("Saudi Arabia Population," 2021), with a confidence level of 95% and an acceptable margin of error of 5%. The expected frequency was 50%, the sample was estimated to be 384.

Data Collection Instruments

Data collected using an electronic questionnaire comprises three sections; the first will include the participants' sociodemographic characteristics, such as age, sex, and nationality. The second part will consist of the validated Arabic migraine screen questionnaire (MSQ) (Alaqeel et al., n.d.). The third part will investigate the quality of life associated with migraines using the Migraine-Specific QOL questionnaire (eprovideTM, 2018), consisting of 14 questions.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) version 26 will analyze the data (IBM Corp., Armonk, NY). For the prevalence and quantitative variables, descriptive statistics will be used. The chi-square test will be used to assess risk factors between categorical

variables, and the Kruskal-Wallis and Mann-Whitney U tests will be used with paranormally distributed continuous variables. A p-value of less than 0.05 will be regarded as statistically significant.

Ethical considerations

The questionnaire started with a brief explanation of its objective and intent and reminded participants that their participation was voluntary. The study was observational on human subjects, so informed consent was taken from participants who answered "yes" to participate. The Research Ethical Committee (REC) Of King Fahad Medical City provided ethical approval. IRB Registration Number with KACST, KSA: H-01-R-012; IRB Registration Number with OHRP/NIH, USA: IRB00010471; Approval Number Federal Wide Assurance NIH, USA: FWA00018774. The surveys didn't collect names or any dates of birth or addresses. All responses will be kept private and safe.

3. RESULTS

Baseline Characters of Participants

This cross-sectional study included 432 responses, and all of them were entered into our analysis. The results in Table 1 showed that most of the participants, 173 (40%), had belonged to the 26-35 age group, followed by 172 (39.8%) were belonged to the 19-25 age group, and 45 (10.4%) had belonged to the 36 – 45 age group. The proportion offemales was higher (65%) than males (35%). It had been found thatmost of the participants were from the southern area (30.1%), followed by (28.9%) from the western region. Almost all our sample was single; 205 (47.5%) and 350 (81%) live in urban areas. University and high school educations were the most educational levels that represented the participants with 327 (75.7%) and 84 (19.4%), respectively. Table 1 shows that the majority of individuals were jobless, Saudis, and had no prior history of chronic diseases: 191 (44.2%), 376 (87%), and 351 (81.3%), respectively.

Table 1 Baseline Characters of Participants (n = 432). Notes: Data are presented as numbers (No.) and percentages (%).

Parameter		No. (%)
Age (year)	19 – 25	172 (39.8%)
	26 – 35	173 (40%)
	36 – 45	45 (10.4%)
	46 – 55	42 (9.7%)
Sex	Female	281 (65%)
	Male	151 (35%)
Region of Residency	Central Region	108 (25%)
	Eastern Region	39 (9%)
	Southern Area	130 (30.1%)
	Northern Area	30 (6.9%)
	Western Region	125 (28.9%)
Residency Type	Bedouin Area	19 (4.4%)
	Rural Area	63 (14.6%)
	Urban Area	350 (81%)
Marital State	Divorced	27 (6.3%)
	Married	189 (43.8%)
	Single	205 (47.5%)
	Widowed	11 (2.5%)
Educational Level	Educated Promises	9 (2.1%)
	High School Education	84 (19.4%)
	Primary Education	9 (2.1%)
	Uneducated	3 (0.7%)
	University Education and More	327 (75.7%)

Nationality	Non-Saudi	56 (13%)
	Saudi	376 (87%)
Occupation	I Do Not Work	241 (55.8%)
	Occupied	191 (44.2%)
Chronic Diseases	No	351 (81.3%)
	Yes	81 (18.8%)

Headache Diagnosis

Headache diagnosis scores (< 4) were found in most of the participants (60.4%), as in Table 2. The number of patients who suffered from headaches 212 (49.1%) was less than those who didn't suffer from it 220 (50.9%). The number of patients who had a headache that lasted more than 4 hours, 205 (47.5%), was lower than the number of patients who did not have a headache that lasted more than 4 hours, 227 (52.5%). One hundred and forty-two people reported a headache with nausea, and two hundred and ninety-one people were affected by light or loud noises during a headache episode. Most of the patients' physical and mental activities were hampered by their headaches 302 (69.9%).

Table 2 Parameters of Headache Diagnosis (n = 432). Notes: Data are presented as numbers (No.) and percentages (%).

Parameter	Yes	No
Do you suffer from frequent headaches?	212 (49.1%)	220 (50.9%)
Have you had a headache that lasted more than 4 hours?	227 (52.5%)	205 (47.5%)
Do you feel a headache accompanied by nausea?	142 (32.9%)	290 (67.1%)
Are you bothered by light or loud sounds during a headache attack?	291 (67.4%)	141 (32.6%)
Does headache affect your physical or mental activity?	302 (69.9%)	130 (30.1%)
Diagnosis (Score >= 4)	171 (39.6%)	261 (60.4%)

Association between Baseline Characters of Participants and Migraine

According to Table 3, most of the participants who had migraines 70 (40.5%) belonged to the 26-35 age group, followed by 67 (39%) of the 19-25 age group. Females 129 (45.9%) had migraines more than males 42 (27.8%). Age and sex were significantly associated with having migraine attacks (p-value = 0.046), and (p-value = 0.001), respectively. Of the participants who live in the southern area, 58 (44.6%) had migraines more than 50 (40%) in the western region. Of the participants who live in urban areas, 137 (39.1%) had migraine more than those who live in rural and Bedouin areas 25 (39.7%) and 9 (47.4%), respectively. Married participants 76 (40.2%) who were exposed to migraine were more than single or divorced participants 74 (36.1%), and 14 (51.9%), respectively. University students 133 (40.7%) and high school students 28 (33.3%) were most exposed to migraine attacks. As shown in Table 3, the unemployed, being Saudis, and those with no previous history of chronic diseases had a higher chance of migraine attacks 146 (38.8%), 97 (40.2%), and 136 (38.7%), respectively. The region of residency, residency type, marital state, educational level,nationality, occupation, and having chronic diseases were non-significantly associated with having migraine attacks (p-value =0.297, 0.775, 0.143, 0.621,0.407, 0.751, and 0.459, respectively).

Table 3 Association between Baseline Characters of Participants and Migraine (n = 432).

Parameter		Migraine		P-value
		Yes	No	
Age (year)	19 – 25	67 (39%)	105 (61%)	0.046
	26 – 35	70 (40.5%)	103 (59.5%)	
	36 – 45	24 (53.3%)	21 (46.7%)	
	46 – 55	10 (23.8%)	32 (76.2%)	
Sex	Female	129 (45.9%)	152 (54.1%)	0.001
	Male	42 (27.8%)	109 (72.2%)	
Region of Residency	Central Region	35 (32.4%)	73 (67.6%)	0.297
	Eastern Region	18 (46.2%)	21 (53.8%)	
	Southern area	58 (44.6%)	72 (55.4%)	
	The northern area	10 (33.3%)	20 (66.7%)	

	Western Region	50 (40%)	75 (60%)	
Residency Type	Bedouin area	9 (47.4%)	10 (52.6%)	0.775
	Rural area (country)	25 (39.7%)	38 (60.3%)	
	Urban area (city)	137 (39.1%)	213 (60.9%)	
Marital State	Divorced	14 (51.9%)	13 (48.1%)	0.143
	Married	76 (40.2%)	113 (59.8%)	
	Single	74 (36.1%)	131 (63.9%)	
	Widowed	7 (63.6%)	4 (36.4%)	
Educational Level	Educated promises	5 (55.6%)	4 (44.4%)	0.621
	high school education	28 (33.3%)	56 (66.7%)	
	primary education	4 (44.4%)	5 (55.6%)	
	uneducated	1 (33.3%)	2 (66.7%)	
	University education and more	133 (40.7%)	194 (59.3%)	
Nationality	Non-Saudi	25 (44.6%)	31 (55.4%)	0.407
	Saudi	146 (38.8%)	230 (61.2%)	
Occupation	I do not work	97 (40.2%)	144 (59.8%)	0.751
	Occupied	74 (38.7%)	117 (61.3%)	
Chronic Diseases	No	136 (38.7%)	215 (61.3%)	0.459
	Yes	35 (43.2%)	46 (56.8%)	

Notes: Data are presented as numbers (No.) and percentages (%).
P-values ≤ of 0.05 is considered statistically significant.

Association between Baseline Characters of Participants and MSQ

The MSQ score mean was the highest with the 36 – 45 age group, male, living in the southern area, being Saudi, and being unemployed (69.8, 69.2, 70.3, 68.3, and 69.9, respectively), but they showed a non-significant association (p-value = 0.851, 0.452, 0.368, 0.177, and 0.075, respectively). In contrast, the MSQ score mean was the highest with living in urban areas, being single, being a university's student, and without any previous chronic diseases (69, 71.3, 68.5, and 70, respectively), and they showed a significant association (p-value = 0.001, 0.001, 0.046, and 0.001, respectively) (Table 4 and figure 1 -4).

Table 4 Association between Baseline Characters of Participants and Migraine-Specific Health-Related Quality of Life (MSQ) (n = 432).

Parameter		MSQ Score	P-value
Age (year)	19 – 25	67.4 ± 22.8	0.851
	26 – 35	65.9 ± 20.3	
	36 – 45	69.8 ± 23.4	
	46 – 55	68.4 ± 24.7	
Sex	Female	66.5 ± 21.6	0.452
	Male	69.2 ± 22.7	
Region of Residency	Central Region	65 ± 21.9	0.368
	Eastern Region	64.7 ± 23.6	
	Southern area	70.3 ± 20.7	
	The northern area	54.6 ± 25.9	
	Western Region	68.5 ± 21.3	
Residency Type	Bedouin area	39.5 ± 12.4	0.001
	Rural area (country)	66.9 ± 19.2	
	Urban area (city)	69 ± 21.6	
Marital State	Divorced	44.6 ± 15.6	0.001
	Married	69.4 ± 21.3	

	Single	71.3 ± 20.3	
	Widowed	44.6 ± 16	
Educational Level	Educated promises	52.2 ± 14.7	0.046
	high school education	67.8 ± 26.8	
	primary education	44.4 ± 15.3	
	uneducated	33.4	
	University education and more	68.5 ± 20.5	
Nationality	Non-Saudi	60.8 ± 24	0.177
	Saudi	68.3 ± 21.3	
Occupation	I do not work	69.9 ± 20.2	0.075
	Occupied	63.6 ± 23.5	
Chronic Diseases	No	70 ± 20.9	0.001
	Yes	56 ± 22.2	

Notes: Data are presented as mean and standard deviation. P-values ≤ of 0.05 is considered statistically significant.

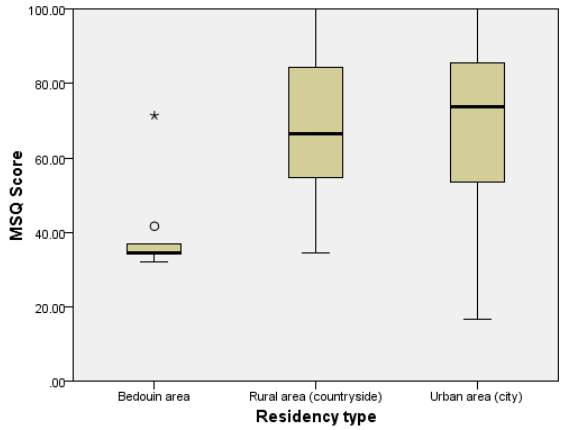

Figure 1 Boxplot showing type of residency in association with Migraine-Specific Health-Related Quality of Life (MSQ) (n = 171)

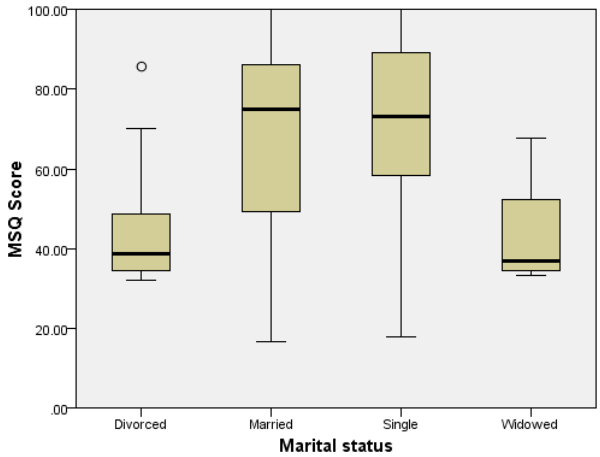

Figure 2 Boxplot showing marital status in association with Migraine-Specific Health-Related Quality of Life (MSQ) (n = 171)

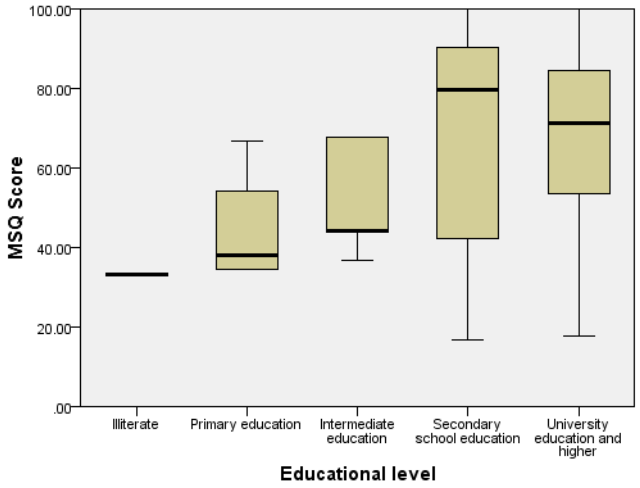

Figure 3 Boxplot showing educational level in association with Migraine-Specific Health-Related Quality of Life (MSQ) (n = 171)

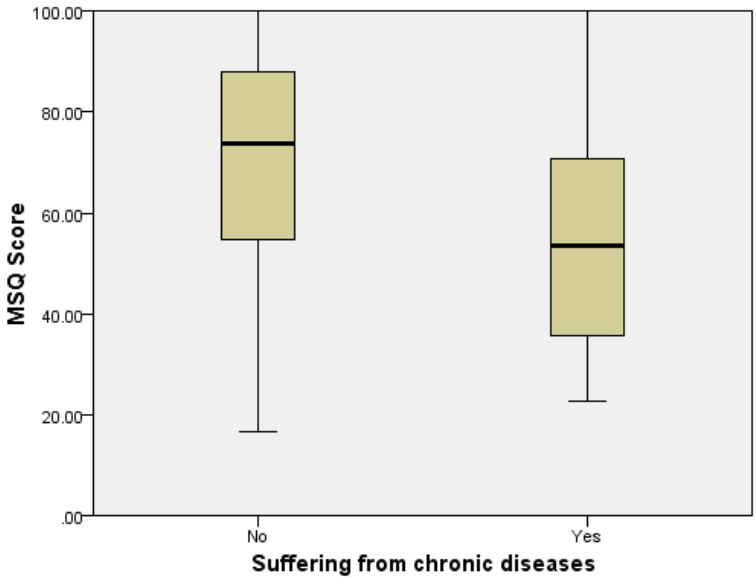

Figure 4 Boxplot showing suffering chronic diseases in association with Migraine-Specific Health-Related Quality of Life (MSQ) (n = 171)

4. DISCUSSION

Globally, 46% of the adult population suffers from an active headache problem, with 11% suffering from migraine (Stovner et al., 2007). Africa has 10.4% migraine prevalence, Asia has 10.1 % prevalence, Europe has 11.4 % prevalence, North America has 9.7% prevalence, and South America has 16.4% prevalence (Woldeamanuel & Cowan, 2017). Migraine headache is a frequent neurological condition that affects Saudis (Almalki et al., 2018). According to the current study, the total prevalence of migraines in Saudi Arabia's general population was 39.58%. Most of our participants (40%) had belonged to the 26-35 age groups, in similarity with Almehmadi & Khan (2020) and Al Harbi and AlAteeq (2020). The proportion of females was higher than males as in agreement with previous literature as Almalki et al., (2018) with (54.3%), Almehmadi & Khan (2020) with (55.9%), and Al Harbi and AlAteeq (2020) with (67%). Almost all our sample was single 205 (47.5%), as in Almalki et al., (2018) study, while Almehmadi & Khan (2020) study showed that most of its sample were married 116 (52.3%). Almost majority of the participants resided in cities, which is consistent with our findings in (Almalki et al., 2018) study. In agreement with our results, university and high school educations were the most educational levels that represented the participants as in (Almalki et al., 2018) study with (57.9%), and

(31.6%) in order, and Al Harbi and Al Ateeq (2020) (43.3%), and (40%), respectively. Most of our participants were unemployed, which disagrees with Al Harbi and AlAteeq (2020). In contrast, most of our participants in the same study (Alharbi and Alateeq, 2020) had no previous history of chronic diseases.

Our results showed that the number of patients who suffered from headaches was less than those who didn't suffer from it, while Rafique et al., (2020) showed that the number of patients who suffered from headaches was 101 (98%) was more than those who didn't suffer from it 2 (2%). Our results showed that the number of patients who had headaches lasting more than 4 hours was less than those who didn't, while Rafique et al., (2020) showed that the number of patients who suffered from headaches was 100 (97%) was more than those who didn't suffer from it 3 (3%). In our study, one hundred and forty-two had a headache accompanied by nausea, while Rafique et al., (2020) had only sixty-eight. Our fining showed that two hundred and ninety-one were bothered by light or loud sounds during a headache attack, while Rafique et al., (2020) had only ninety-three. The headache affected the physical and mental activities of most of the patients in our study 302 (69.9%) and in Rafique et al., (2020) study 91 (88.7%).

Most of our participants, 70 (40.5%) who had migraines, belonged to the 26-35 age group, while most participants, 69 (50%) in Al Qarni et al., (2020) study who had migraines belonged to the less than 30 years age group. We found that females 129 (45.9%) had migraines more than males 42 (27.8%), as, in Al Qarni et al., (2020) study 93 (67.4%), while Almehmadi & Khan (2020) study found that males (92) had a headache in the last three months more than females (74). Sex was significantly associated with having migraine attacks, as in Al Qarni et al., (2020) study. As we found, married participants were exposed to migraines more than single, agreeing with Almehmadi & Khan (2020). In contrast, single participants were exposed to migraines more than married in the Al Qarni et al., (2020) study.

The MSQ score showed a non-significant association with age (p-value = 0.851), in contrast with Rafique et al., (2020) study that showed a significant association (p-value = 0.04). In contrast with our results, the MSQ score showed a non-significant association with the marital status (p-value = 0.235) in Almehmadi & Khan (2020) study. In agreement with our findings, Almehmadi & Khan (2020) presented a non-significant association between MSQ score and sex.

The Limitation and Strength Points

Our cross-sectional study included 432 participants, which was more than half of previous literature as Almalki et al., (2018) with 354 participants, Almehmadi & Khan (2020) with 222 participants, and Al Harbi and Al Ateeq (2020) with 300 participants. In contrast, Desouky et al., (2019), Al Qarni et al., (2020), and Rafique et al., (2020) had a sample more than our sample.

5. CONCLUSIONS

According to the current study, the total prevalence of migraines in Saudi Arabia's general population was 39.58%. In addition, females and middle-aged individuals in this research had a significant prevalence of migraines. According to our findings, individuals living in the southern region had more migraines than those in the western region. Those who lived in urban regions had more migraines than those who lived in rural and Bedouin areas. Migraine attacks were more common in married people and university students. The most prevalent migraine symptoms were nausea and being bothered by light or loud sounds during a headache attack. The research recommends that people become more aware of migraines and the significance of obtaining medical help.

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Author Contributions

All authors act equally in protocol preparation, data collection, data analysis, and writing.

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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