PREVALENCE OF HEADACHE; MIGRAINE AND NON-MIGRAINE AND ASSOCIATED CO-MORBID CONDITIONS: A POPULATION-BASED STUDY IN KINGDOM OF SAUDI ARABIA

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Abstract

Background: One of the most prevalent illnesses of the nervous system is headache. People with migraine struggle because it frequently interferes with their regular activities. Migraine has a significant impact on the personal, social, emotional, and physical lives of the patients.

Aims: To study the prevalence of headache (Migraine and Non-Migraine) and associated Co-morbid conditions among the adult population in Saudi Arabia.

Materials and methods: A cross-sectional study was conducted on adult population from the ages 18 years onwards from both genders who are living in northern province of Saudi Arabia. Our data was collected via a self-administered questionnaire including demographic, diagnostic and therapeutic variables. Data was analyzed using SPSS software.

Results: The study included 421 participants, the majority fall within the 21-35 age group, accounting for 35.4% of the total. 67.5% of participants suffer from headaches, and 32.5% do not.

From the 284 participants who suffer from headaches, 47.9% reported experiencing migraines, while 52.1% reported non-migraine headaches. Additionally, the onset of headaches varied, with 38.0% experiencing headaches for 1-10 years, 9.9% for 11-20 years, 10.6% for over 20 years, and 41.5% reporting no recurring headaches. Majority of respondents have heard of migraines, with 88.4% indicating awareness.

Conclusion: A high prevalence of headaches and migraine among general Saudi population in Northern Saudi Arabia highlights the need of targeted interventions and comprehensive healthcare methods in reducing the burden of headaches on individuals and the Saudi healthcare system.

Key words: Migraine. Prevalence. Saudi Arabia. Northern Province. headache Non-Migraine. Co-morbid conditions

Introduction

Headache is a prevalent neurological undertreated medical condition that contributes to suffering and disability is migraine [1]. It can cause a severe headache, such as a throbbing pain on one side of the head, along with dizziness, nausea, and increased sensitivity to light or loud noises. Migraine is typically the first experienced by a person under the age of 35 [2]. Earlier epidemiological research has revealed that 4.5% of people in Western Europe had headaches at least 15 days a month, compared to adults in the USA, people in Asian nations, and people in Saudi Arabia, where the frequency is 14.2% [3]. Moreover, prevalence is significantly higher in females, the majority of people are unaware of the pre-migraine triggers, which include stress, oral contraceptives, sleep disturbances, prolonged exposure to sunlight or heat, and the menstrual cycle [4]. Furthermore, a key factor in migraines is family history, which also plays a significant role [5]. The vast majority of people will experience fewer attacks if they can identify their triggers and take steps to avoid them [6–8]. Migraines negatively affect our lives by causing absenteeism from work, which reduces productivity at work [9, 10]. As we previously discussed, noise can cause migraines, so the person avoids social gatherings, which results in a decline in the student's academic performance and in their social life. [11]. Furthermore, numerous studies have demonstrated that migraines have an emotional impact that enhances the prevalence of depression, particularly in women [12]. This study seeks to assess the prevalence of migraines and headaches, their epidemiological and illness characteristics, and their relationships to other co-morbid disorders among the general population of the northern province of Saudi Arabia. The current study aims to assess the prevalence of headaches (migraine and non-migraine) and associated co-morbid conditions among the adult population in Saudi Arabia.

Materials and methods

Study design

A cross-sectional study was conducted on the adult population of both genders who are living in the northern province of Saudi Arabia. It study was conducted in Arar, Saudi Arabia, in September 2023.

Sampling, sample size and duration of study

The adult general population above 18 years in the Northern Border Region. The sample size is calculated using formula $n = (z^2 \times pq)/d^2$, where n represents the sample size, z is the standard deviation (1.96), p is the prevalence (0.5), q is 1-p, DE is the design effect (2), and d is the accepted error (0.05), was determined 421. Participants were selected through non-probability convenience sampling. The study lasted for five months.

The data collection tool which had integrated eligibility and sampling through an online self-administered questionnaire prepared in Arabic after reading and accepting the informed consent and distributed via an anonymous online survey instrument, was used to assess the awareness pattern of headaches (migraine and non-migraine) and associated co-morbid conditions among the adult population in KSA, as adopted from previous studies [10].

Participant Recruitment

It was limited to adult population of both genders above 18 years in the northern province of Saudi Arabia and excluding population below 18 years, people on visit visas from other countries, people with mental illness, and people on anti-psychotic drugs.

Survey measures

The survey questions included demo-graphic information (age, gender, occupation, marital status, level of education and region), Distribution of headache characteristics among the participants by the type of headache, Statements pertaining to factors related with migraine headache and Co-morbidities recorded among the participants by the type of headache.

Pilot Study: A pilot study was conducted on 10% of the gathered sample to test the reliability and applicability of the study to ascertain the feasibility, applicability, and clarity of the tool, and no modifications were done. Participants in the pilot study were excluded from the study.

Statistical analysis and data analysis: IBM's SPSS v21 was used. Continuously measured variables was described using the mean and standard deviation, while categorically measured variables was described using frequency and percentages. The correlations between categorically measured variables was assessed using the chi-squared (χ^2) test of independence. The statistical significance of mean differences in metric variables across levels of binary outcomes was evaluated using the independent sample t-test.

Ethical issues: Ethics approval was obtained from Research Ethics Committee of the college of medicine (HAP-09-A-043) at the Northern Border University that was issued by decision no (79-44-H). Informed consent was obtained from

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participants, and all collected data were kept confidential and used solely for the purpose of this study.
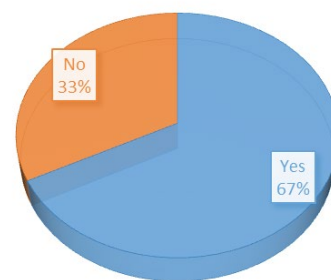
Results

Table 1 shows that the majority fall within the 21-35 age group, accounting for 35.4% of the total. This is followed by the 41-45 age group at 23.0% and the 36-40 age group at 12.1% and 17.1% falling within the 18-20 age range. In terms of gender distribution, females constitute a substantial majority at 78.1% compared to males at 21.9%. Nationality-wise, the data reflects a predominance of Saudi respondents, comprising 93.3% of the total, with the remaining 6.7% being non-Saudi. Additionally, a noteworthy finding is the presence of a category labeled "no" at 34.9%. The distribution of respondents across different regions is also detailed, with the majority hailing from Arar at 54.6%, followed by "Other" regions at 37.8%. Educational levels are well-represented, with majority holding a Bachelor's degree at 71.3%, followed by secondary education at 16.6%. Occupation-wise, the data illustrates a diverse range of roles, with "Official body employee" being the most prevalent at 38.0%. The presence of "anything else" at 40.6% indicates a varied mix of occupations within the sample. Marital status distribution shows a majority of married respondents at 54.2%, followed by single individuals at 42.3% (Table 1 & Figure 1).

(Table 2) shows that, of the 284 participants who suffer from headaches,

Table 1. Sociodemographic characteristics of participants (n=421) n (%).

Parameter		No.	Percent n %
Age	18-20	72	17.1
	21-35	149	35.4
	36-40	51	12.1
	41-45	97	23.0
	50-55	44	10.5
	More than 60	8	1.9
Gender	Male	92	21.9
	Female	329	78.1
Nationality	Saudi	393	93.3
	Non-Saudi	28	6.7
	No	147	34.9
Region	The two foreheads	1	.2
	Shuba	2	.5
	Al-Awiqila	6	1.4
	Rafha	11	2.6
	Al-Habas Kindergarten	3	.7
	Turaif	9	2.1
	Arar	230	54.6
	Other	159	37.8
Education Level	Uneducated	5	1.2
	Primary	12	2.9
	Middle	8	1.9
	secondary	70	16.6
	Bachelor's	300	71.3
	Postgraduate	26	6.2
Occupation	Householder	50	11.9
	businessman	22	5.2
	Factor	18	4.3
	Official body employee	160	38.0
	anything else	171	40.6
Marital Status	Married	228	54.2
	Single	178	42.3
	Divorced	11	2.6
	Widowed	4	1.0
Daily working hours	Less than an hour	22	5.2
	2-4 hours	50	11.9
	5-7 hours	248	58.9
	8 hours or more	101	24.0
Daily sleeping hours	4 hours or less	29	6.9
	5-6 hours	134	31.8
	6-7 hours	115	27.3
	7-8 hours	111	26.4
	8 hours or more	32	7.6

As illustrated in figure (1), 67.5% of participants suffer from headaches, and 32.5% do not.

Figure 1. Prevalence of headache among study participants (n= 421) n (%).

47.9% reported experiencing migraines, while 52.1% reported non-migraine headaches. Among those experiencing migraines, the frequency of attacks per week varied, with 36.8% reporting once a week, 34.6% twice a week, 11.8% three times a week, 9.6% more than three times a week, and 7.4% reporting constant attacks. 15.4% reported absence from the workplace, 12.5% felt incapacitated, 28.7% experienced anger, 16.2% felt depression, 11.0% were unable to study, 8.1% could not attend family or social events, and 8.1% reported other impacts. The frequency of monthly headaches was also analysed, with 36.3% experiencing headaches once a month, 48.2% experiencing them 2-6 times a month, 12.0% experiencing them 7 times or more, and 3.5% experiencing 12 headaches per month. Moreover, the data explored the nature of the pain, with 50.4% reporting pain on one side, 25.0% reporting pain usually on one side, and 24.6% reporting pain scarcely on one side. Additionally, the onset of headaches varied, with 38.0% experiencing headaches for 1-10 years, 9.9% for 11-20 years, 10.6% for over 20 years, and 41.5% reporting no recurring headaches.

As in (Table 3), it is evident that a significant proportion of respondents reported experiencing a throbbing headache, with 82.7% indicating its presence compared to 17.3% who did not. Similarly, a considerable number of individuals reported experiencing headaches after daily work, with 66.2% affirming its occurrence. Moreover, the data indicates that 69.0% of participants observed an improvement in their headaches after rest, while 59.9% reported experiencing fewer headaches per week. Furthermore, the prevalence of specific symptoms associated with headaches, such as unilateral eye redness, increased sensitivity to light, exacerbated headaches due to sounds, as well as the presence of nausea and vomiting.

(Table 4) shows that majority of respondents have heard of migraines, with 88.4% indicating awareness. However, when it comes to understanding the condition, the numbers decrease significantly, with only 71.1% claiming to know about migraines and an even smaller percentage (64.4%) being able to differentiate between headaches and migraines. Only 25.4% of respondents reported being diagnosed with migraines, indicating a substantial portion of individuals who may be experiencing symptoms but have not received a formal diagnosis. Furthermore, a significant percentage (44.0%) indicated a family history of migraines. Understanding the causes, signs, symptoms, and preventive measures for migraines is crucial for effective management. However, the data suggests that there is a lack of comprehensive knowledge in these areas, with relatively low percentages of respondents indicating awareness. Additionally, it is noteworthy that a considerable number of individuals (75.0%) recognize the impact of migraines on work or study. When it comes to treatment and management, the data reflects varying levels of awareness. While a significant portion of respondents (61.6%) understand the duration and types of chronic migraines, there are lower percentages of awareness regarding specific treatment approaches and criteria for chronic migraine diagnosis.

(Table 5) presents a comprehensive overview of the knowledge of participants regarding the comorbid diseases associated with migraine. When considering cerebrovascular diseases, 78 participants (27.5%) indicated awareness of the potential link to migraine, while 206 participants (72.5%) reported no knowledge of this association. Similarly, for meningitis, 63 participants (22.2%) acknowledged the connection to migraine, while 221 participants (77.8%) did not. 72 participants (25.4%) were knowledgeable about the association between migraine and loss of consciousness, while 212 participants (74.6%) were not. Additionally, 58 participants (20.4%) recognized multiple sclerosis as a potential associated comorbid disease with migraine, with 226 participants (79.6%) having no knowledge of this association. Notably, certain parameters, such as emotional disturbance, eye disorders, and chronic sinusitis, exhibited

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Table 2. Determinants of headache among participants who have headaches (n=284) n (%).

Parameter		No.	Percent n (%)
If yes what type	Migraine	136	47.9
	Non-migraine headache	148	52.1
If migraines, how many attacks per week (n= 136)	Once	50	36.8
	Twice	47	34.6
	3 times	16	11.8
	More than 3 times	13	9.6
	Always	10	7.4
If migraines: how it affects quality of life (n= 136)	Absence from the workplace	21	15.4
	I got you tied to the bed	17	12.5
	It made you angry	39	28.7
	It made you depressed	22	16.2
	Can't study	15	11.0
	It is not possible to attend family or social events	11	8.1
	anything else	11	8.1
Frequency of monthly headaches	Once/month	103	36.3
	2-6 times	137	48.2
	7- times or more	34	12.0
	12 times	10	3.5
Pain on one side	Sometimes	143	50.4
	Usually	71	25.0
	Scarcely	70	24.6
Headache onset	1-10 years	108	38.0
	11-20 years	28	9.9
	20 years or more	30	10.6
	No recurring headaches	118	41.5

Table 3. Parameters related to headaches and their corresponding percentages of occurrence (n=284) n (%).

Parameter	Yes n (%)	No n (%)
Throbbing headache	235 (82.7%)	49 (17.3)%
Headache after daily work	188 (66.2)%	96 (33.8%)
Headache improves after rest	196 (69.0%)	88 (31.0%)
Fewer headaches per week	170 (59.9%)	114 (40.1%)
Headache increases with activities	218 (76.8 %)	66 (23.2%)
Eye redness was unilateral with headache	114 (40.1%)	170 (59.9%)
Mild cold headache	170 (59.9%)	114 (40.1%)
More sensitivity to light with headache	219 (77.1%)	65 (22.9%)
Sounds make headaches worse	239 (84.2%)	45 (15.8%)
Nausea with headache	150 (52.8%)	134 (47.2%)
Vomiting with headache	72 (25.4)	212 (74.6%)
Fever with headache	63 (22.2)	221 (77.8%)
Headache occurs for the last 4 hours without treatment	138 (48.6 %)	146 (51.4%)
Headache occurring within the last 72 hours without treatment	110 (38.7%)	174 (61.3%)
The occurrence of headaches that do not subside without treatment	148 (52.1%)	136 (47.9%)

relatively higher levels of awareness among participants, with percentages exceeding 40% for knowledge of association with migraine. Conversely, conditions like multiple sclerosis diseases, tumors, and congenital heart malformations demonstrated comparatively lower levels of awareness among the participants.

Based on the statistical data provided in (Table 6), it is evident that there is a significant correlation between the presence of headaches and various demographic and lifestyle factors. Individuals within the age range of 21-35 exhibit the highest prevalence of headaches at 35.4%, while those aged 50-55 and those over 60 years old have lower prevalence rates at 10.5% and 1.9% respectively. The P value associated with age is 0.140, indicating that there is no statistically significant association between age and the presence of headaches. Moving on to marital status, the data suggests a notable association between being single and experiencing headaches, with a P value of 0.020. Specifically, 42.3% of single individuals reported having headaches compared to 54.2% of married individuals, 2.6% of divorced individuals, and 1.0% of widowed individuals. Gender also appears to play a role in the prevalence of headaches, as the data indicates a significant association with a P value of 0.001. Notably,

21.9% of males reported having headaches compared to 78.1% of females. Furthermore, when considering nationality, the data suggests that there is no statistically significant association between nationality and the presence of headaches, with a P value of 0.194. The majority of both Saudi and non-Saudi participants reported experiencing headaches at rates of 31.1% and 6.7% respectively. In terms of region, the data presents varying prevalence rates of headaches across different regions, but the P value of 0.412 indicates that there is no statistically significant association between region and the presence of headaches. Education level also shows no statistically significant association with headaches, as indicated by a P value of 0.173. However, there are varying prevalence rates across different education levels, with the highest prevalence observed among individuals with a bachelor's degree at 71.3%. Occupation and daily working hours exhibit no statistically significant associations with headaches, as indicated by P values of 0.147 and 0.068 respectively. However, it is notable that individuals working 8 hours or more daily reported the highest prevalence of headaches at 24.0%. Lastly, daily sleeping hours display a significant association with headaches, as indicated by a P value of 0.005. Notably, individuals sleeping 4 hours or less daily reported the highest prevalence of headaches at 6.9%.

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Table 4. Knowledge of participants of migraine (n=284) n (%).

Parameter	Yes n (%)	Neutral n (%)	No n (%)
Heard of migraine	251 (88.4%)	19 (6.7%)	14 (4.9%)
Know about migraines	202 (71.1%)	46 (16.2 %)	36 (12.7%)
Know the difference between headache and migraine	183 (64.4%)	43 (15.1%)	58 (20.4%)
Diagnosed with migraines	72 (25.4%)	35 (12.3%)	177 (62.3%)
Family history of migraine	125 (44.0%)	34 (12.0%)	125 (44.0%)
Know about the causes of migraines	110 (38.7%)	32 (11.3%)	142 (50.0%)
Know about the signs and symptoms of migraines	168 (59.2%)	32 (11.3%)	84 (29.6%)
Know about preventive measures for migraines	112 (39.4%)	39 (13.7%)	133 (46.8%)
Know that work or study can often be affected by migraines	213 (75.0%)	25 (8.8%)	46 (16.2%)
Know about the treatment that is used for migraines	117 (41.2%)	31 (10.9%)	136 (47.9%)
Chronic migraines can be long-lasting (attacks lasting up to 72 hours)	137 (48.2%)	67 (23.6%)	80 (28.2%)
Chronic migraines can be short in duration (attacks last 4 hours or more on average)	175 (61.6%)	65 (22.9%)	44 (15.5%)
Chronic migraine is defined as 15 or more headache days per month for more than 3 months	132 (46.5%)	105 (37.0%)	47 (16.5%)
Chronic migraine has two types: 1. Chronic migraine with aura	136 (47.9%)	100 (35.2%)	48 (16.9%)
Chronic migraine has two types: 2. Chronic migraine without aura	104 (36.6%)	91 (32.0%)	89 31.3%
New Supplement criteria recommend that more than eight migraine attacks be diagnosed as chronic migraine	175 (61.6%)	58 (20.4%)	51 (18.0%)
Symptoms associated with migraines include nausea, photophobia, or phonophobia	178 (62.7%)	58 (20.4%)	48 (16.9%)
Careful history taking very important in diagnosing migraines	200 (70.4%)	45 (15.8%)	39 (13.7%)
Lifestyle modifications part of the broad approaches to treating chronic migraine	162 (57.0%)	71 (25.0%)	51 (18.0%)
Acute and preventive treatments part of the broader approach to treating chronic migraine	90 (31.7%)	136 (47.9%)	58 (20.4%)
Anticonvulsants the second line of treatment for chronic migraine	92 (32.4%)	113 (39.8%)	79 (27.8%)

Table 5. Knowledge of participants of comorbid diseases associated with migraine (n=284) n (%).

Parameter	Yes n (%)	No n (%)
Cerebrovascular diseases	78 (27.5%)	206 (72.5%)
Meningitis	63 (22.2%)	221 (77.8%)
Loss of consciousness	72 (25.4%)	212 (74.6%)
Multiple sclerosis	58 (20.4%)	226 (79.6%)
Stroke	52 (18.3%)	232 (81.7%)
Heart valve disease	54 (19.0%)	230 (81.0%)
Congenital heart malformations	43 (15.1%)	241 (84.9%)
Asthma	73 (25.7%)	211 (74.3%)
Diabetes	61 (21.5%)	223 (78.5%)
Hypertension	111 (39.1%)	173 (60.9%)
Hypotension	90 (31.7%)	194 (68.3%)
Hyperlipidaemia	94 (33.1%)	190 (66.9%)
Thyroid disorders	94 (33.1%)	190 (66.9%)
Depression	120 (42.3%)	164 (57.7%)
Emotional disturbance	118 (41.5%)	166 (58.5%)
Obstructive sleep apnea	82 (28.9%)	202 (71.1%)
Eye disorders	137 (48.2%)	147 (51.8%)
Chronic sinusitis	142 (50.0%)	142 (50.0%)
Tumors	68 (23.9%)	216 (76.1%)
Multiple sclerosis diseases	62 (21.8%)	222 (78.2%)

Discussion

The prevalence of headaches, particularly migraines, has been a significant concern globally, and this study adds to the existing body of knowledge by focusing on the population of KSA. The findings reveal that headaches, including migraines, are a common health problem in KSA, with a considerable portion of the population experiencing these conditions. Furthermore, the study also examines the co-morbid conditions associated with headaches, providing a comprehensive understanding of the impact of headaches on overall health and underscores the importance of addressing headaches not only as a standalone condition but also in relation to their potential impact on other aspects of health and well-being.

According to our study results, 67.5% of participants suffer from headaches, and 32.5% do not of the 284 participants who suffer from headaches, 47.9% reported experiencing migraines, while 52.1% reported non-migraine headaches. This high prevalence was on the line with Saudi study. In this study, participants reported a significant prevalence of headaches [13]. Recent research on individuals living in high-altitude settings has revealed a significant prevalence of headaches, particularly migraines [14]. This high prevalence of migraines headache is also consistent with findings from a prior study in Taif [8]. Another recently released study from Saudi Arabia's capital, Riyadh, revealed an 84% frequency [15]. These findings are in contradiction to previous studies, raising interesting considerations. A 2010 study of the epidemiology of headache in the Arab region included two community-based studies from Saudi Arabia with significant sample sizes [16]. These results are also comparable to global data. According to a comprehensive review and meta-analysis of the results of 30 research, Iran, a Middle Eastern country, has a 14% migraine prevalence [17]. Migraine prevalence rates vary by region: the US reported 11.7%, Germany 10.6%, Turkey 16.4%, India 22.8%, and the United Kingdom 14.3% [15]. According to the UK study, migraine affects around 5.85 million adults aged 16 to 65. Every day, 190,000 people suffer migraine attacks, which have a severe impact on productivity, costing 25 million working days [18].

Typical migraine headache symptoms included pulsating headaches, sensitivity to light, bouts recorded after daily work, limited relief after rest, aggravated by activities, and strong light. In terms of triggering elements, well-established patterns were discovered, with light, anxiety, lack of sleep,

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Table 6. Association between sociodemographic characters of participants with presence of headache (n=421) n (%).

		Suffer from headache		Total n (%)	P value
		Yes n (%)	No n (%)		
Age	18-20	53 (12.6%)	19 (4.5%)	72(17.1%)	
	21-35	108 (25.7%)	41(9.7%)	149 (35.4%)	
	36-40	28 (6.7%)	23 (5.5%)	51 (12.1%)	
	41-45	63 (15.0%)	34 (8.1%)	97 (23.0%)	0.140
	50-55	28 (6.7%)	16(3.8%)	44 (10.5%)	
	More than 60	4 (1.0%)	4(1.0%)	8 (1.9%)	
Marital status	Single	131 (31.1%)	47(11.2%)	178 (42.3%)	0.020
	Married	140 (33.3%)	88 (20.9%)	228 (54.2%)	
	Divorced	9 (2.1%)	2 (0.5%)	11 (2.6%)	
	widow	4 (1.0%)	0 (0.0%)	4 (1.0%)	
Gender	Male	46 (10.9%)	46(10.9%)	92 (21.9%)	0.001
	Female	238 (56.5%)	91 (21.6%)	329 (78.1%)	
Nationality	Saudi	262 (62.2%)	131(31.1%)	393 (93.3%)	0.194
	Non-Saudi	22 (5.2%)	6 (1.4%)	28 (6.7%)	
Region	The two foreheads	1 (0.2%)	0 (0.0%)	1 (0.2%)	0.412
	Shuba	2 (0.5%)	0 (0.0%)	2 (0.5%)	
	Al-Awiqila	3 (0.7%)	3 (0.7%)	6 (1.4%)	
	Rafha	5 (1.2%)	6 (1.4%)	11 (2.6%)	
	Al-Habas Kindergarten	1 (0.2%)	2 (0.5%)	3 (0.7%)	
	Funny	5 (1.2%)	4 (1.0%)	9 (2.1%)	
	Arar	157 (37.3%)	73(17.3%)	230 (54.6%)	
	Other	110 (26.1%)	49 (11.6%)	159 (37.8%)	
Education Level	uneducated	4 (1.0%)	1 (0.2%)	5 (1.2%)	0.173
	primary	12 (2.9%)	0 (0.0%)	12 (2.9%)	
	Middle	4 (1.0%)	4 (1.0%)	8 (1.9%)	
	Secondary	47 (11.2%)	23 (5.5%)	70 (16.6%)	
	Bachelor's	201 (47.7%)	99 (23.5%)	300 (71.3%)	
	Postgraduate	16 (3.8%)	10 (2.4%)	26 (6.2%)	
Occupation	Householder	36 (8.6%)	14 (3.3%)	50 (11.9%)	0.147
	businessman	10 (2.4%)	12 (2.9%)	22 (5.2%)	
	Factor	14 (3.3%)	4(1.0%)	18 (4.3%)	
	Official body employee	105 (24.9%)	55 (13.1%)	160 (38.0%)	
	anything else	119 (28.3%)	52 (12.4%)	171 (40.6%)	
Daily working hours	Less than an hour	15 (3.6%)	7 (1.7%)	22 (5.2%)	0.068
	2-4 hours	41(9.7%)	9 (2.1%)	50 (11.9%)	
	5-7 hours	157 (37.3%)	91 (21.6%)	248 (58.9%)	
Daily sleeping hours	4 hours or less	24 (5.7%)	5 (1.2%)	29 (6.9%)	0.005
	5-6 hours	98 (23.3%)	36 (8.6%)	134 (31.8%)	
	6-7 hours	82 (19.5%)	33 (7.8%)	115 (27.3%)	
	7-8 hours	61 (14.5%)	50 (11.9%)	111 (26.4%)	
	8 hours or more	19 (4.5%)	13(3.1%)	32 (7.6%)	

and fasting serving as the primary triggers [19]. In our study, a significant proportion of respondents reported experiencing a throbbing headache, with 82.7% indicating its presence compared to 17.3% who did not. The prevalence of specific symptoms associated with headaches, such as unilateral eye redness, increased sensitivity to light, exacerbated headaches due to sounds, as well as the presence of nausea and vomiting. These relationships have also been suggested in prior investigations [20]. Migraines may be a significant risk factor for the majority of cardiovascular illnesses. According to a new study, migraines with aura increase the risk of carotid thickness, but migraines without aura have a low risk of carotid plaques and arterial stiffening [21]. According to Janoska, migraine is associated with dyslipidemia. Another study found that women with migraines have a higher relative risk of acquiring hypertension than those without migraines [22]. According to a study on the influence of headaches on visual quality of life, migraine sufferers have a much lower quality, Depression, worry, and stress have been linked to migraines [23]

The study provides valuable insights into the prevalence of headaches and associated co-morbid conditions in the Kingdom of Saudi Arabia. However, it is important to acknowledge the limitations of this study. One limitation is the reliance on self-reported data, which may introduce bias and inaccuracies. Additionally, the study's cross-sectional design may limit the ability to establish causal relationships between headache prevalence and co-morbid conditions. Future research should consider addressing these limitations to further enhance the understanding of this important public health issue in KSA.

The findings of this study have significant implications for the future, as they can inform healthcare policies and strategies for addressing the burden of headaches and associated co-morbid conditions in the country. Additionally, the data from this study can serve as a foundation for further research and interventions aimed at improving the management and prevention of headaches in the KSA. Overall, this study is a crucial step towards understanding and addressing the impact of headaches on the population of Saudi Arabia.

Conclusion

A high prevalence of headaches and migraine among general Saudi population in Norther Saudi Arabia. The findings highlight the need of targeted interventions and comprehensive healthcare methods in reducing the burden of headaches on individuals and the Saudi healthcare system. The study is an invaluable resource for healthcare practitioners, academics, and policymakers working to improve headache management and treatment in Saudi Arabia.

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