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Prevalence of Headache, Migraine, and TTH in Medical Students at Northern Border University

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Abstract

Medical students are often considered a high-risk group for stress-related conditions, including primary headaches. Previous research on primary headaches in this population has shown an association between poor academic performance and the need for intervention. This study aimed to assess the prevalence of primary headaches among medical students at Northern Border University in Arar, Saudi Arabia. This cross-sectional study used an online questionnaire administered at a single point in time. The study sample included 405 medical students from Saudi Arabia, of whom 50.9% were males, 49.1% were females, and 91.9% of participants were aged 18-24 years. The frequency of headache attacks was reported as once daily by 54.2%, twice daily by 18.7%, and three times daily by 17.6%, while 33 participants experienced one headache attack weekly, 23.5% had 2 attacks weekly, and 25.6% had three attacks weekly. In terms of intensity, 34.5% reported severe headaches, 34.8% moderate headache, and 30.7% mild headache. Headaches were often accompanied by symptoms such as nausea (46%), vomiting (42.7%), photophobia (56.5%), phonophobia (60.9%), and neurological disturbances (48.3%). Approximately 29.7% of participants used prescribed headache medications, while 18.9% self-medicated without a prescription. Primary headache is highly common among medical students in Saudi Arabia, posing a significant challenge to their quality of life and academic performance. It is essential to emphasize the importance of consulting a neurologist if headaches are experienced.

Keywords: TTH, Headache, Migraine, Medical students

Introduction

Primary headaches are widely recognized as a common neurological condition that can affect individuals of all ages. These headaches occur without an underlying disease or physical injury and are linked to a variety of factors causing intermittent or chronic pain in the head region [1]. Primary headaches account for approximately 90% of all headaches, while only 10% are attributed to secondary causes [2]. The American Academy of Neurology estimates that the global prevalence of migraines, a subtype of primary headaches, is 18% in women and 6% in men [3]. Studies by the International Headache Society suggest that tension-type headaches (TTH) are present in 30% to 78% of the general population, while cluster headaches are relatively rare, affecting less than 0.5% [4]. Among primary headaches, the most prevalent are migraines, tension-type headaches, and trigeminal autonomic cephalalgias. Primary headaches, especially migraines, tend to follow a cyclic pattern, with each attack marked by a complex set of symptoms. While the exact cause of these primary headache disorders remains elusive, many experts believe they result from brain dysfunction, with particular involvement of the cranial blood vessels and the trigeminal nerve [2].

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Headaches are a common complaint among medical students, triggered by various physical and mental stressors. These headaches significantly affect students' academic performance, quality of life, and overall functionality, often leading to additional psychiatric concerns [5]. Considering the critical role of medical students in healthcare, their headache problems can also hinder their future professional performance, presenting a substantial burden on both individuals and society [6, 7]. However, given the unclear origins of migraine and tension-type headaches, further epidemiological research focusing on specific populations is essential for identifying the factors that contribute to the frequency and severity of these conditions [8]. This study focuses on evaluating the prevalence of primary headache problems among medical students at Northern Border University in Arar, Saudi Arabia.

Materials And Methods

From May 1st to October 31st, 2022, a cross-sectional study was conducted, including 303 participants selected randomly from the medical student population at Northern Border University, located in Arar, Saudi Arabia. The participants were invited to complete a self-administered questionnaire, which was distributed through social media platforms such as WhatsApp, Twitter, and Facebook. The online questionnaire was tailored specifically to the study's objectives and was divided into four sections. The first section gathered sociodemographic information, including age, gender, marital status, and academic year. The second section addressed symptoms, triggers, and treatments associated with primary headaches.

The introduction provided participants with an overview of the study's purpose, and an informed consent form was included with the questionnaire. Since no clinical exams or blood tests were conducted, the results were solely based on the students' responses.

Sampling Procedure

The total number of medical students at Northern Border University is 674. A total of 303 students were selected using systematic random sampling. These participants were those who agreed to take part in the study after giving written consent and completing the questionnaire. Students who declined participation, provided incomplete responses, or were from other institutions were excluded.

Inclusion Criteria

- Saudi nationals
- Students from Northern Border University
- Willingness to participate

Exclusion Criteria

- Non-Saudis
- Students not from Northern Border University
- Those not willing to participate

Pilot Study

A pilot study was carried out on 10 students to assess the validity and clarity of the tool. No changes were made following the pilot study, and these students were excluded from the main study.

Data Management and Analysis

The data collected was entered and analyzed using SPSS version 23 (Statistical Package for the Social Sciences, Chicago, IL, USA). Descriptive statistics were used, and for qualitative data, percentages were calculated. The Chi-square test was applied to determine statistical significance, with a P-value < 0.05 considered significant.

Ethical Considerations

The study was approved by the Research Ethics Committee of Northern Border University. An introductory explanation of the study's goals and importance was provided in the questionnaire. The study ensured participant anonymity and the secure handling of data to protect privacy.

Results And Discussion

A total of 405 individuals participated in the study, with 50.9% being male and 49.1% female. The majority (91.9%) of the participants were between the ages of 18 and 24. Additionally, 64% were unmarried, and 50.6% reported being smokers, as shown in **Table 1**.

Table 1. The sociodemographic characteristics of the participants (n = 405).

Parameter	No.	Percent

Gender	**Male**	**206**	**50.9**
	Female	199	49.1
Age (years)	18-24	372	91.9
	25-39	22	5.4
	40-59	7	1.7
	60+	4	1.0
Marital status	Unmarried	260	64.2
	married/married	134	33.1
	divorced / widow	11	2.7
Monthly income	< 5,000 SAR	169	41.7
	5000-10000 riyals	177	43.7
	> 10,000 riyals	59	14.6
Physical activities (walking for half hours or more/week)	Start	167	41.2
	1	113	27.9
	3-1	102	25.2
	3+	23	5.7
Smoking	Yes	205	50.6
	No	200	49.4

According to **Table 2**, 96.5% of participants experienced a headache in the past three months. Among them, 54.2% had headache episodes once a day, 18.7% experienced them twice a day and 17.6% reported having them three times daily. Additionally, 33% of participants reported having one headache per week, 23.5% had two weekly, and 25.6% had three weekly headache episodes.

Table 2. Average headache attacks among study participants (n = 405)

Parameter		**No.**	**Percent**
Experienced headaches within the last 3 months	Yes	391	96.5
	No	14	3.5
Frequency of headache episodes (per day)	Once	212	54.2
	Twice	73	18.7
	Three times	69	17.6
	Furthermore	37	9.5
Frequency of headache episodes (per week)	Once	129	33.0
	Twice	92	23.5
	Three times	100	25.6
	Furthermore	70	17.9
Frequency of headache episodes (per month)	Once	114	29.2
	Twice	67	17.1
	Three times	78	19.9
	Furthermore	132	33.8

According to **Table 3**, 62.7% of participants reported an increase in the frequency of their headaches since they began. The onset of headaches was gradual for 37.3%, sudden for 33.8%, and varied for 28.9%. The duration of headaches was typically brief, lasting minutes for 35.5% and 26.1% of participants, while 30.7% and 32.2% experienced headaches lasting several hours, and 33.28% and 41.7% reported headaches lasting days, with and without the use of medication, respectively.

Regarding the intensity of the headaches, 34.5% reported severe pain, 34.8% described it as moderate, and 30.7% experienced mild pain. About 33% of participants reported one-sided headaches, while the rest experienced pain on both sides. The nature of the headache was identified as pulsating by 58.3% and compressive by 41.7%. When it came to medical consultations, 21% of participants saw a family doctor, 26.3% visited a neurologist, and 52.7% didn't seek any medical help.

Table 3. Determinants of primary headache among study participants (n = 405)

Variable	Category	Number (n)	Percentage (%)
Headache frequency progression	Increased	245	62.7
	Not increased	146	37.3
Onset pattern of headache	Gradual	146	37.3
	Sudden	132	33.8
	Varies	113	28.9
Usual time of headache occurrence	Morning	106	27.1
	Evening	170	43.5
	Night	115	29.4
Duration with medication	Minutes	139	35.5
	Hours	120	30.7
	Day	132	33.8
Duration without medication	Minutes	102	26.1
	Hours	126	32.2
	Day	163	41.7
Intensity of headache	Intense	135	34.5
	Moderate	136	34.8
	Light	120	30.7
Headache location	One side	129	33.0
	Both sides	262	67.0
Headache character	Pulsating	228	58.3
	Compressive	163	41.7
Medical consultation for headache	Family physician	82	21.0
	Neurologist	103	26.3
	Did not consult anyone	206	52.7

As detailed in **Table 4**, 64.5% of respondents reported that headache episodes led to delays in their routine tasks, while 47.1% indicated that such episodes interfered with their ability to perform daily activities. Physical exertion was identified as a factor that worsened headache symptoms in 44.2% of cases. Additionally, 46% experienced nausea during episodes, 42.7% reported vomiting, 56.5% noted sensitivity to light, 60.9% were affected by noise, and 48.3% experienced one or more neurological disturbances.

Table 4. Effects of headache on daily activity and its associated symptoms an=mong study participants (n = 405)

Parameter		No.	Percent
Daily activities postponed due to headache	Yes	252	64.5
	No	139	35.5
Headache interferes with the performance of daily tasks	Yes	184	47.1
	No	207	52.9
Physical exertion aggravates headache symptoms	Yes	173	44.2
	No	218	55.8
Headache episodes occur alongside nausea	Yes	180	46.0
	No	211	54.0
Vomiting associated with headache incidents	Yes	167	42.7
	No	224	57.3
Hypersensitivity to light during a headache	Yes	221	56.5
	No	170	43.5
Increased sensitivity to noise during headache	Yes	238	60.9
	No	153	39.1
Temporary neurological symptoms present, such as visual or speech disturbances	Yes	189	48.3
	No	202	51.7

As shown in **Table 5**, 29.7% of the participants reported using prescribed medication for managing headaches, while 18.9% relied on non-prescription drugs, and 51.4% did not take any medication. A family history of headaches was noted in 50.9% of the cases. Regarding the duration of headache history, close to 50% had been experiencing it for less than one year, approximately one-fourth between 2–3 years, and 10.2% for over five years. In terms of work absenteeism due to headaches over the past year, 31.5% missed 1–5 days, 25.6% missed more than 5 days, and 43% didn't report any absences.

Table 5. Use of medications and family history of headaches among study participants (n = 405)

Parameter		No.	Percent
Use of medicines	Use as a prescription	116	29.7
	Use without a prescription	74	18.9
	Don't use medicines	201	51.4
Family history of headaches	Yes	199	50.9
	No	192	49.1
Headache duration (in years)	Less than 1 year	192	49.1
	Two to three years	98	25.1
	Three to five years	61	15.6
	More than five years	40	10.2
Absenteeism from work because of a headache during the last year	5-1 days	123	31.5
	More than five days	100	25.6
	I did not miss	168	43.0

Investigating primary headache disorders among university students is essential, particularly because this population may be at elevated risk due to stress-related academic demands, irregular sleep schedules, and inconsistent eating patterns. To conduct this study, a convenience sample was taken from the Schools of Medicine and Psychology, as these student groups share similar headache-related risk profiles [9]. Prior literature has emphasized the vulnerability of medical students to stress-induced primary headaches, with evidence linking poor academic performance to the need for targeted intervention strategies [3]. This research seeks to estimate the prevalence of primary headaches among medical students at Northern Border University, located in Arar, Saudi Arabia.

Data from our study revealed that 96.5% of participants experienced headaches within the last three months. Regarding frequency, 54.2% reported experiencing one headache per day, 18.7% reported two daily episodes, and 17.6% experienced three daily attacks. Weekly occurrences included one episode for 33 participants, two for 23.5%, and three for 25.6%. A Riyadh-based investigation of headache prevalence among medical students identified an overall rate of 53.78%, with tension-type headaches being the most frequent (41.66%) and migraines affecting 7.1%. Only a single case of cluster headache was documented, while 3.78% fell under unspecified categories [5]. Another Saudi study found that 63% of adults had primary headaches within the previous year [3]. Beyond medical students, a study targeting healthcare workers in Taif hospitals showed that 88.3% of respondents experienced headaches during three months [10]. Internationally, reported prevalence rates among medical students have varied widely, ranging from 33.0% to 96.8% [11–16]. In the Western Region of Saudi Arabia, an observational cross-sectional study cited a one-year prevalence of 89.6% [3]. In Palestine, TTH and migraines affected 59.8% and 22% of medical students respectively, with basic-year students displaying higher susceptibility [12]. At Udayana University in Denpasar, over 80% of medical students reported experiencing headaches in the past year, and nearly 67% experienced episodes within the last 1–3 months. More than 10% noted a substantial impact on their daily lives. Notably, 50.8% described their headaches as pulsating, and 78% reported recurrence up to five times monthly [17]. An Iranian study conducted at Isfahan University of Medical Sciences found migraine prevalence to be 14.2% and TTH at 44.2% [18]. In the present study, 33% indicated that their headaches occurred on one side of the head, while the rest experienced bilateral headaches. This is comparable to earlier findings highlighting the frontal region as the most commonly affected area (24.1%) [19], with similar

outcomes documented in Saudi Arabia by Shehata et al. [20] and in India by Nandha and Chhabra [21]. Regarding headache quality, 58.3% characterized the pain as pulsating, while 41.7% described it as compressive. This observation aligns with data from Momayyezi *et al.* [22], where 50.9% reported pressing pain, 25.9% pulsating, and 22.6% lancinating pain.

Despite their medical background, many students in our cohort did not seek professional care for headaches. Only 29.7% used prescription medication, 18.9% relied on over-the-counter drugs, and more than half (51.4%) reported no medication use. These findings contrast with research by Da Costa *et al.* [23], where 84% of medical students reported self-medication and 34% consulted healthcare professionals. In Deleu *et al*.'s study, only 23% sought medical evaluation, while 80% practiced self-medication [15]. Blau's research reported that just 8% of headache sufferers pursued medical advice [24], whereas Amay *et al*. indicated that 56% were self-treated, and half of them sought clinical help during headache episodes [25]. Deleu *et al.* also noted a 40% self-medication rate in a rural Omani population [15].

The notable level of self-treatment among our participants may stem from their medical training, pharmacological knowledge, and easy access to analgesics. Cultural and demographic differences across populations may explain the wide variability in reported self-medication rates. In our sample, 52% indicated that headaches did not cause them to miss classes, potentially due to mild symptom intensity, effective self-care practices, or strong academic motivation [15, 20].

Lastly, 50.9% of respondents with migraine reported a family history of headaches, which is broadly consistent with findings from Balaban et al., who noted that 72% of migraine-afflicted medical students had a familial predisposition [26]. In contrast, Ghorbani et al. reported a lower rate of 20.6%, highlighting variability in family history reporting among migraine cases in different studies [27].

Conclusion

Primary headaches are highly prevalent among medical students in Saudi Arabia, presenting a significant challenge to their lifestyle and academic performance. The Faculty of Medicine should implement awareness programs to educate students about the widespread occurrence of migraines, their recognition, and their impact on academic outcomes. Additionally, it is crucial to highlight the importance of consulting a neurologist for those experiencing headaches. Stress management workshops should also be introduced, helping students learn effective techniques to alleviate stress, ultimately reducing the negative effects of migraines on their academic and extracurricular activities.

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