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Epidemiological, clinical and pharmacological aspects of headache in a university undergraduate population in Palestine

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Abstract

Headache is one of the most common complaints in clinical practice. Few studies regarding headache in university students have been conducted in the Middle East. The objective of this study was to explore the prevalence, clinical characteristics, triggering factors and treatment options of headaches in university undergraduate students in Palestine/ Middle East. Data were collected by interviewing a sample of 1900 students. The Headache Assessment Quiz was used to measure quality and severity of headache and to collect data on triggering factors and symptom management. A total of 1808 (95.2%) reported having at least one headache episode in the previous year. A positive family history of headache was found in 40% of students. The prevalence rate of frequent headache (tow or more episodes/month) was found in 1096 (60.9%) students; 613 women (55.9%). Of those having frequent headaches, 228 (20.8%) experienced moderate to severe episodes, 341 (31.2%) had pulsating, throbbing and pounding pain, and 274 (25%) had unilateral pain. The most common triggering factors among students with frequent headaches were: tension/stress (78.2%) and sleep deprivation (75.4%). Less than 5% of students sought medical assistance during headache episodes. Most students (79.1%) reported self-therapy with a single analgesic (53.4%), herbs (10.2%) or combination (15.5%), while 20.9% reported using no medication of any type to decrease pain. Paracetamol (48.5%) followed by ibuprofen (4.9%) were the most commonly used non-prescription analgesic drugs. Headache is a prevalent symptom in the college age population. Further research is needed to determine the prevalence of specific types of headaches. Healthcare providers are required to educate this population as well as to assist students in properly diagnosing and treating headache types.

Keywords
Headache, university students, Palestine

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Introduction

Headache is an important general health problem (1–3). Severe and frequent headache episodes constitute a significant burden for both the individual and the community (4). Population-based studies of headache are numerous (5–10). However, fewer studies have been conducted on headache frequency in the young adult population. A study conducted in Norway of adolescents between 12 and 19 years old found that 69.4% of boys and 84.2% of girls had experienced headaches within the past year and that > 29% reported recurrent headaches (11). In a second study, Brazilian college students were surveyed for characteristics of migraine or tension-type headache. Of 1000 participants, 25% experienced migraine and 32.9% reported tension headache (12).

Treatment of headache usually includes medication and non-medication approaches such as behavioural and diet therapy. The most common medications used for headaches are analgesics. However, overuse of analgesics might be harmful (13). In many situations, patients with headache do not seek medical attention

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and often seek self-management, which is often inappropriate (14). Linet et al. interviewed 10 169 adolescents and young adults aged 12–29 years and found that approximately 85% of the men and 72% of the women had never seen a doctor because of problems related to headache (15).

Little is known about the prevalence and characteristics of headache in young populations in the Middle East in general and Palestine in particular. In this part of the world, conflict and instability constitute a major cause of tension and stress among all age categories. We undertook this study with the following aims: (i) to explore prevalence and management of headache among young undergraduate university students; (ii) to assess triggers of headache episodes among this young population; and (iii) to compare our findings with those obtained from communities with fewer political and national conflicts. The ultimate goal was to determine whether the prevalence and quality of headache in this specific population warrant further studies and attention by health policy makers.

Methodology

Study population

This was a cross-sectional, questionnaire-based, observational study carried out during the months of January and February 2009 among undergraduate students enrolled at An-Najah National University in Nablus. Research Ethics Committee approval was obtained before initiation of the study. The study area, An-Najah National University, is the largest university in Palestine with approximately 17 000 full-time undergraduate and graduate students. All students enrolled in the University are of the same ethnic background. The university offers medical and non-medical education through its 16 different colleges.

Study tool: the questionnaire

A structured questionnaire containing both open-ended and close-ended questions was developed for this study (Appendix 1). Before the start of the project and collection of data, the questionnaire was pilot-tested during October and November 2008 in > 50 students. Based on the preliminary results generated through the pilot study, the questionnaire was modified and finalized. It contained four sections. The first was the demographic section, which contained questions regarding age, gender, type of colleges, place of residence, wearing eye glasses and family history of headaches. In this section, there was also a question investigating whether the student had experienced headache episodes in the previous year and the frequency of these episodes. The term 'headache' included all forms of headache and was defined to the participants as any acute or chronic pain experienced within the cranial cavity. The second section of the questionnaire was used to assess the quality and severity of headache episodes through 10 questions. This section was mainly based on the Headache Assessment Quiz (HAQ), a commonly used instrument developed by GlaxoSmithKline (copyright 1997–2009) (http://www.headachequiz.com/headache_quiz/headache_quiz.jsp). The questions in this section were presented as a four-point Likert-type scale for eliciting severity and quality of headaches with possible responses including: always, usually, rarely and never. The third section contained 14 yes–no questions regarding potential headache triggers (see Appendix 1). The final section contained questions related to management and medications consumed by the participants during the episode.

Collection of data

Data were collected by means of an interview based on the questionnaire described above. The interview was carried out under the supervision of the first author and by previously trained senior pharmacy students. The students were introduced to the objectives of the project thoroughly and were well trained. Participants were recruited at more than 10 various sites in the university campus to ensure recruitment of students of both genders and from different colleges. There was a recruiting centre in each building as well as at the university food court. Confidentiality was ensured to all students, who were asked to volunteer; none was reimbursed. To ensure random and unbiased sampling, no attempt was made to select students who self-identified as suffering from headache. Furthermore, no note or sign was shown in the recruiting areas to indicate the purpose of the project. Collection of data continued for 6 days and collection was made at different times during the day. Each student entering the building was asked to participate. Collection of data continued until 1900 interviews had been conducted. The completion time for each interview was approximately 10 min.

Statistical analysis

All data were coded, entered, and then analysed using the Statistical Package for Social Sciences program (SPSS), version 16 (SPSS Inc., Chicago, IL, USA). Descriptive results were expressed as frequency, percentage and mean $\pm$ S.D. P-values < 0.05 were accepted as statistically significant. Students with headaches were classified as having frequent (two or more episodes/month) or infrequent (fewer than one episode/month)

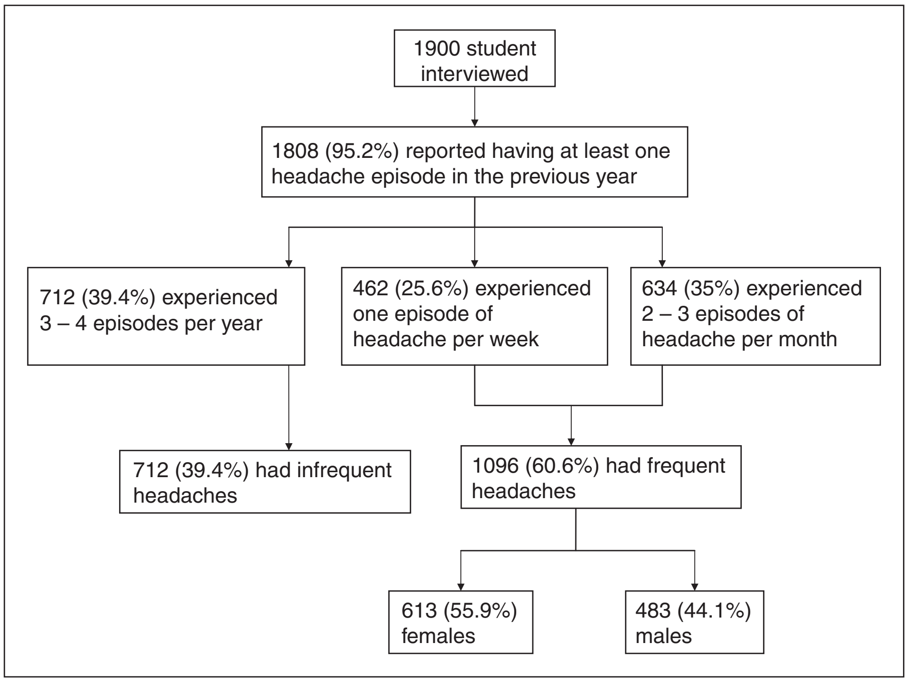

Figure 1. Frequency of headache.

headaches. Pearson's χ^2 was used to test for significant relationships between categorical variables.

Results

Demographic characteristics of the participants

In this study, a total of 1900 students agreed to participate and were interviewed, giving a response rate of 99%. Half of the students were female, giving an equal male : female ratio. The average age of the students was 20.4 ± 1.7 years (range 17–32 years). The majority (57%) of participants came from the suburbs. More than one-third (37%) were living in dormitories and 24.9% were using eye glasses.

Frequency of headache

It was noted that 92 (4.8%) participants had not had any headache episode, whereas 1808 (95.2%) had experienced at least one episode in the previous year. When asked about the frequency of their headache episodes, 462 (25.6%) experienced one episode per week, and 634 (35%) experienced two to three headache episodes per month. In total, 1096 (60.6%) participants reported experiencing frequent headaches (two or more episodes/month). A total of 712 (39.4%) participants reported that their headache episodes occurred infrequently (fewer than one episode/month). Data regarding the frequency of headaches are shown in Figure 1.

Characteristics of headache

We focused our analysis of headache on the 1808 students who reported having headache episodes in the previous year. We further analysed and compared the severity and quality of headache episodes in the group of students having 'frequent' headaches (1071/1808; 56.4%) with those having 'infrequent' headaches (712/1808; 37.5%). Comparative results of the characteristics of frequent and infrequent headaches are shown in Table 1. Characteristics associated mainly with frequent headaches include: moderate-to-severe pain ($P = 0.001$), throbbing and/or pulsating pain ($P = 0.005$), unilateral episodes ($P = 0.045$), pain worsening upon bending or movement ($P = 0.006$), bothered by noise/sound ($P = 0.025$), bothered by light ($P = 0.036$) and need to limit or avoid daily activity ($P = 0.009$).

Headache triggers

All participants reporting headache episodes were asked about headache triggers. The most commonly reported triggering factors were: stress or tension (78.2%), sleep deprivation (75.4%), intense or strong light/noise (59.4%), mood changes (53.5%) and missing meals (47.5%). Comparison of triggering factors among students with frequent and infrequent headaches is shown in Table 2. Results showed that the following triggers were significantly associated with

Table 1. Quality of headache stratified with frequency

Characteristics of headache episode	Frequent headache ≥ 2 episodes/month N = 1096	Infrequent headache ≤ 1 episodes/month N = 712	*P*-value
Have moderate to severe pain	228 (20.8%)	98 (13.8%)	< 0.001
Have pulsating, pounding or throbbing pain	342 (31.2%)	179 (25.25)	0.005
Have worse pain on one side of your head	274 (25%)	149 (20.9%)	0.045
Have worse pain when you move or bend over	373 (34.1%)	198 (27.8%)	0.006
Have nausea	125 (11.4%)	62 (8.7%)	0.066
Have sensitivity to or bothered by sound/noise	299 (42%)	519 (47.4%)	0.025
Have sensitivity to or bothered by light	201 (19.2%)	109 (15.3%)	0.036
Need to limit or avoid daily activity	490 (44.7%)	274 (38.5%)	0.009
Want to lie down in a quiet, dark room	472 (43.1%)	285 (40%)	0.2
See visual disturbances, spots or light flashes	175 (16%)	94 (13.2%)	0.1

Table 2. Common headache triggers stratified by frequency

Trigger	Frequent headache ≥ 2 episodes/month N = 1096	Infrequent headache ≤ 1 episodes/month N = 712	*P*-value
Intense lights, smells, or sounds	680 (62%)	394 (55.3%)	0.005
Weather changes	559 (51%)	291 (40.9%)	< 0.001
Allergies or sinus pain/pressure	447 (40.8%)	257 (36.1%)	0.046
Stress or tension	877 (80%)	536 (75.3%)	0.017
Too little sleep	850 (77.6%)	514 (72.2%)	0.01
Too much sleep	345 (31.5%)	208 (29.2%)	0.3
Missed meals	567 (51.7%)	292 (41%)	< 0.001
Lack of caffeine	276 (25.2%)	131 (18.4%)	0.001
Too much caffeine	97 (8.9%)	58 (8.1%)	0.6
Entering certain places	375 (34.2%)	204 (28.7%)	0.013
Lack of cigarette smoking	164 (15%)	109 (15.3%)	0.84
Changes in mood/excitement	622 (56.8%)	345 (48.5%)	0.001
Certain types of food	119 (10.9%)	69 (9.7%)	0.43
Watching television for many hours	450 (41.1%)	275 (38.6%)	0.3
Working on the computer for many hours	652 (59.5%)	397 (55.8%)	0.12
Menstrual cycle (women)	238 (38.8%)	103 (34.1%)	0.17

frequent headaches: strong and intense light/noise ($P = 0.005$), weather changes ($P = 0.001$), allergies or sinus pain/pressure ($P = 0.046$), stress or tension ($P = 0.017$), sleep deprivation ($P = 0.01$), missing meals ($P = 0.001$), lack of caffeine ($P = 0.001$), entering certain places ($P = 0.013$) and finally, changes in mood/excitement ($P = 0.01$).

Analysis of results showed that the following were also significantly associated with frequent headache: wearing eye glasses, ($P = 0.022$), family history of headaches ($P = 0.001$) and experiencing aura more ($P = 0.001$). However, in women the menstrual cycle did not differ as a headache trigger in students with frequent and infrequent headaches (38.8% vs. 34.1%; $P = 0.17$).

Medications used for headache management

Less than 5% of the participants reported that they sought medical assistance during headache episodes,

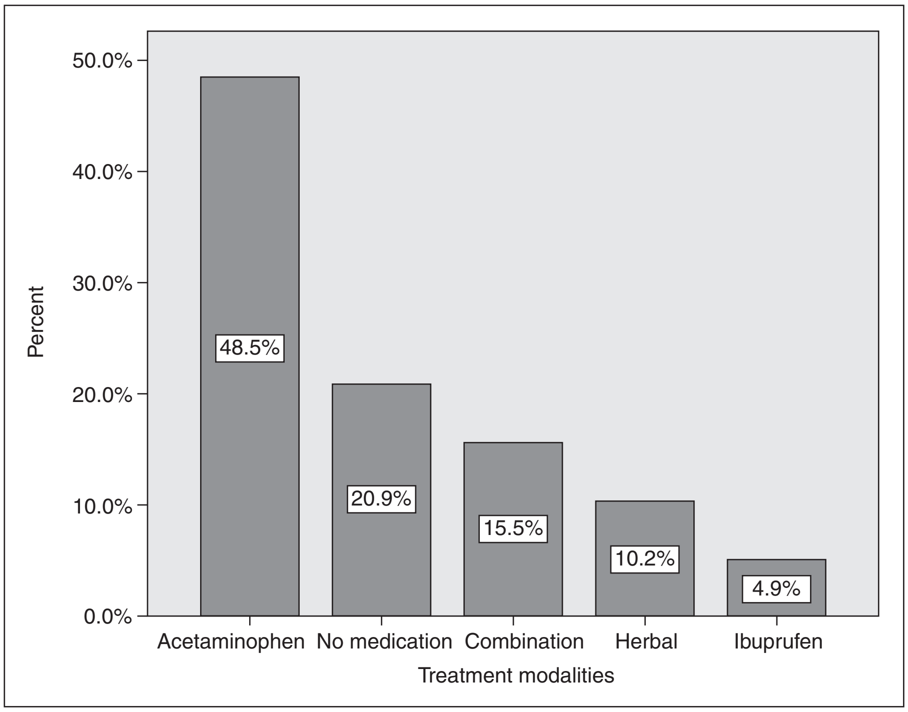

Figure 2. Treatment options for headache among students reporting at least one episode in the previous year. Results included respondents who listed brand names. Combination remedy included two analgesics or one analgesic with herbal remedy.

and one-third (79.1%) reported that they would self treat with an analgesic, herbal remedies or combination. The most frequently reported medication used in self therapy of headache was paracetamol, with 48.5% of the students surveyed using the drug alone and 15.5% using the drug in combination with other over-the-counter (OTC) medications or herbs. Other OTC medications chosen by the participants included various dosage forms and strengths of ibuprofen, which was used alone (4.9%) or in combination with others (14.4%). Herbal and home remedies were chosen by 10.2% as monotherapy and 1.6% with other medications (Figure 2).

Surprisingly, 20.9% of students indicated that they took no medications for headache relief. Those patients reported lying down or isolating themselves from the environment to relieve headache. Others stated that they did nothing at all to relieve pain. Approximately 81% of those with frequent headaches reported that their headache episodes subsided within <4 h even without medication, while 19% reported that their episodes would not subside without medications. In contrast, 88% of those with infrequent headaches reported that their episodes subsided within 4 h without medication and 13% reported the need for medications to abort the episode.

Discussion

This study is the first of its type in Palestine and one of the few studies carried out in the Middle East area. The study has shown that 95.2% of the surveyed students had at least one headache episode during the previous year. It also showed that 20.8% of students with frequent headaches had their episodes as moderate-to-severe pain. A study carried out in medical students in Oman in the Gulf area has shown that the last-year prevalence of headache was 96.8% (16). This is slightly higher than that reported by Amayo et al. and Ojini et al., who reported 88% and 46%, respectively, for last-half-year prevalence of headache in Nigeria (3,17). Other studies carried out using a similar methodology have yielded similar results. Blau showed that only 2.1% of all preclinical medical and dental students had never experienced any headache (18). Portuguese and Spanish studies reported 92% last-year prevalence of headache (19,20).

In this study, 60.6% of participants had frequent headaches (two or more episodes/month). This is higher that that reported by other studies. Curry et al. carried out a questionnaire-based study in a university undergraduate population in Tampa (FL, USA) showing that approximately 51% of the surveyed students reported more than two episodes of headache per month (21). A study carried out in school children aged 12–20 years in Karachi, Pakistan showed that the prevalence of headache was 85.7% and that nearly half of them had a frequency of three or fewer episodes per month and that the students with frequent headaches had most of the characteristics that accompany migraine-type headaches (22).

In this study, the prevalence of frequent headaches in women was higher than that in men (55.9% vs. 44.1%; $P < 0.001$). This is comparable to other studies (1,23). In this study, in both frequent and infrequent headache sufferers, a family history of headache was a strong component. This finding is similar to other studies that have shown a positive family history of headaches. In this study, overall 40% reported a positive family history of headache. In a study carried out in Oman (Arabian Gulf), 58% reported a positive family history of headaches (16). A study carried out in Qassim (Saudi Arabia) among adults showed a 40% positive family history among individuals with primary headaches (24). Our results showed that stress/tension followed by sleep deprivation was the most common triggering factor for headache regardless of the frequency of headache. In Palestine, stress is common among this age category given the volatile political situation, occupation, limited freedom of mobility, very harsh economic conditions and violence. However, in a study among undergraduate students in the USA, stress was the also most common triggering factor (92.9%) of headache among the surveyed students (21). This suggests that stress is a major triggering factor among young adults regardless of living conditions and that at such an age students experience considerable stress in facing an uncertain future.

Our data showed that paracetamol, which is available in Palestine in at least 10 different brand names, was the most popular analgesic used by students to self-treat headache episodes. It was surprising that none of the students interviewed reported the use of antimigraine prescription drugs. It is possible that most of the students with migraine had not been diagnosed before. In fact, a study reported that migraine often goes undiagnosed and that 60% of patients with migraine are deprived of antimigraine treatment (25). In this study, a very low percentage of students sought medical advice for headache episodes. In a study carried out by Sanvito et al., only 7.1% of students with headache sought medical attention upon episodes (2). Other studies have shown similar low percentages. Merikangas et al. noted that only 9.1% of those with migraine with aura sought medical attention (26). The use of herbs reported in this study to self-treat headache episodes was not surprising given the strong religious and cultural beliefs in herbs in the Middle East. A study by Sawlaha et al. indicated that 33.9% of university students in Palestine reported using herbal remedies in self-therapy and those most herbal remedies were used primarily for the treatment of headache (27).

Our study has both strengths and weaknesses. The population studied was large and data were collected by personal interview. However, this study relied exclusively on information provided by the respondents about their headache, which itself is a subjective and non-measurable complaint. Since the participants were not initially aware of the purpose of the project, it is not possible that the results were skewed upward. The very high response rate of participation supports this assumption. This study should be expanded to include additional screening questions focusing on whether the student has had a headache assessment performed by a medical provider and what specific diagnostic studies, if any, the student has received in the past. In addition, more information is needed to determine the reliability and validity of the HAQ instrument. In conclusion, headache is a prevalent symptom in the college age population. Further research is needed to determine the prevalence of specific types of headache. Healthcare providers should educate this population as well as assist students in properly diagnosing and treating headache types.

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Appendix I

Gender:
Age:
College:
Academic year:
Place of living:
Eye glasses (Y, N)

Q1. Do any of your family members have recurrent headache episodes? (Yes, No)

Q2. Did you have headache episodes in the previous year? (Yes, No)

Q3. If 'yes', then how many episodes of headaches did you have?

1–2/year	1–2/6 months	1/month
2–3/month	$\geq$ 1 every week	

Q4. When you have a headache episode, how long does it last without a medication?

1–4 h	4–12 h	12–24 h
24–72 h	$>$ 72 h	

Q5. When you have an episode of headache, how often do you

Have moderate to severe pain	Never	Rarely	Usually	Always
Have pulsating, pounding or throbbing pain	Never	Rarely	Usually	Always
Have worse pain on one side of your head	Never	Rarely	Usually	Always
Have worse pain when you move or bend over	Never	Rarely	Usually	Always
Have nausea	Never	Rarely	Usually	Always
Have sensitivity to or bothered by light	Never	Rarely	Usually	Always
Have sensitivity to or bothered by sound/noise	Never	Rarely	Usually	Always
Need to limit or avoid daily activity	Never	Rarely	Usually	Always
Want to lie down in a quiet, dark room	Never	Rarely	Usually	Always
See visual disturbances, spots or light flashes	Never	Rarely	Usually	Always

Q6. Check any of the following that could trigger a headache episode with you.

1	Intense lights, smells, or sounds	Yes	No
2	Weather changes	Yes	No
3	Allergies or sinus pain/pressure	Yes	No
4	Stress or tension	Yes	No
5	Too little sleep	Yes	No
6	Too much sleep	Yes	No
7	Missed meals	Yes	No
8	Lack of caffeine	Yes	No
9	Too much caffeine	Yes	No
10	Entering certain places	Yes	No
11	Lack of cigarette smoking	Yes	No
12	Changes in mood/excitement	Yes	No
13	Certain types of food	Yes	No
14	Watching television for many hours	Yes	No
15	Working on the computer many hours	Yes	No
16	Monthly menstrual cycle (women)	Yes	No

Q7. Do you usually have any warning symptoms which alert you that you are going to have a headache episode? (Yes, No)

Q8. When you have a headache episode, check what you do

1. Take medications available at home
2. Take medications from pharmacy
3. Go to the physician
4. Take herbal remedies at home (specify ...)
5. Do not take anything, just lie down.
6. Others (specify:)

Q9. If you take prescribed or OTC medications for headache episode, what are they?