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Frequency and risk factors for headache disability: A population-based cross-sectional study in Egypt

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Abstract:

BACKGROUND: A headache is a very common condition that can have a significant impact on one's quality of life. It is one of the leading causes of years lived with disability worldwide. The objective of the study was to determine the prevalence of primary headache disability, its characteristics, risk factors and its impact on daily life.

MATERIALS AND METHODS: A cross-sectional study was conducted in Fayoum governorate. The sample size was 1909 participants. A multistage random sample technique was used to select adults aged above 18 years. A self-structured questionnaire solicited information on sociodemographic characteristics, headache characteristics, and the headache disability index. SPSS v 22.0 was used for data analysis.

RESULTS: Headaches caused complete disability in 19.5% of the study group, and 76.8% developed severe disability. Participants who reported that they had a headache more than once a week were; 44.5% had moderate pain and 40.2% had more intense pain. About 55% complained of attacks rather than continuous headache and were more likely to have a degree of complete disability, ($P = 0.001$). A statistically significant association was found between living in urban areas, working in professional occupations, complaining of severe headache in the form of an attack and seeking medical advice, with high scores of headache disability.

CONCLUSION: Headache is a condition that affects the entire population in a way that causes high levels of disability. Good management is necessary for the reduction of the adverse effects of headaches on the health of the population. This should focus on raising public awareness by means of education and on the provision of basic healthcare.

Keywords:

Disability, headache, headache disability index, pain

Introduction

A headache is a very common condition that can have a significant impact on one's quality of life. It is a leading cause of years lived with disability worldwide, especially of people under 50 years of age. During the attack, a headache severely limits a person's ability to function, thereby impacting negatively on their daily activities and their social and mental

well-being.^[1,2] Owing to its high prevalence and incapacitating effect, the World Health Organization launched a global campaign to reduce the burden of headaches.^[3]

The International Classification of Headache disorders III divides headaches into three categories: primary headache such as migraine and tension-type headache, secondary headaches due to underlying conditions, and other headaches like painful cranial neuropathy. However, the primary type headache has the most impact, with tension-type headache at a prevalence of 38% and migraine considered the most disabling.^[4]

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A multiplicity of factors plays a major role in the occurrence of headache, including being one of the symptoms in various health conditions. Most of the known causal factors for a primary headache is related to an unhealthy lifestyle.^[5] In addition, recent studies outlined a direct link between headaches and regular aspects of current modern life such as prolonged use of digital technology and the smart phone.^[6,7]

Besides having to treat any present underlying conditions of headaches, the complaint is mostly a self-managed with over-the-counter simple pain killers as existing headache management protocols are not successful.^[2,3] A recent discovery of calcitonin gene-related peptide (CGRP) as a key pathophysiological target in migraine opened the door to innovative treatments such as the monoclonal antibodies for CGRP or its receptor and others. However, owing to the impact of the current COVID-19 pandemic on health resources, there has been a slowdown in the progress of these innovative therapies.^[8]

The Global Burden of Disease Study has rated headache disorders as a top cause of years lost to disability (YLD).^[9] Given the associated disability and financial costs to society, headache disorders are a public health issue. Estimates of the financial cost of headache disorders to society are quite high, mostly because of lost working hours and decreased output, as they are most problematic during the productive years (late teens to mid-fifties). However, in Egypt and specifically in our Fayoum community, the lack of the required information hinders our effort to provide the needed care. Given the high prevalence of headaches and the potentially promising therapies, it is necessary to assess the unmet needs and existing barriers and promote action towards the better management of headaches to reduce its impact on health.

As an essential step to improving headache management to reduce its disabling effect on Fayoum residents, our study aims to identify the occurrence of headache as perceived by the patient and assess the disability level and its impact on normal daily functions and overall quality of life. The study objectives were to assess the frequency of headache as perceived by the patients and its characteristics and disability level on a population-based sample of Fayoum residents.

Materials and Methods

A cross-sectional descriptive community survey was conducted in Fayoum governorate, Egypt, between October 2022 and February 2023. The sample size of 1066 participants was calculated using Epi Info 2000 software (Atlanta, Georgia).^[10] With a type I error of 0.05 and an 90% power level, and expected prevalence

of 50%, the number was increased to 2000 to compensate for nonresponse or incomplete data. A total of 1909 participants were recruited in the study with a response rate of 95.5%. Houses, our sample unit, were chosen randomly using multistage cluster sampling. Based on the population size, three healthcare centers and three healthcare units were randomly selected to represent different urban and rural areas. The next stage was the selection of the main street in the healthcare facilities' catchment area. Then, every third house was enrolled in the study with all the adult members of the household aged above 18 years. Ethical approval was obtained from the Institutional Review Board vide Letter No. R291 dated 09/10/2022 and informed written consent was taken from all participants in the study.

A self-structured questionnaire was initially created in English by the researchers for data collection. With the help of a competent bilingual specialist as a third reviewer, the questionnaire was translated into Arabic, and translated back by an independent translator and finally reviewed by both researchers for any ambiguity.

The questionnaire comprised three sectors. The first part had sociodemographic characteristics, and the second had headache characteristics such as the location of the headache, its form, intensity, frequency, causes, as well as physician specialties sought for its management. The third part consisted of the Headache Disability Index (HDI).^[11]

The HDI questionnaire had 27 items. The patient was asked in the first two questions to rank the severity of the headache (mild, moderate, and severe), frequency (1 per month, more than 1 but <4 per month, and more than 1 per week). The remaining items assessed aspects related to the quality of life to establish headache disability. HDI scoring was 4 points if the participant checked "Yes" on any line; if they checked "Sometimes," they got 2 points; and if they checked "No," they got zero points. A score of 10-28% was classified mild disability, 30%-48% was moderate, 50%-68% severe, and 72% or more was considered complete disability.

In our study, all participants who complained of having at least one headache were included in the study to capture all forms of headache and assess the extent of its disabling effect. To ensure that the questions were accurate, clear, and easy to understand, the validity and reliability of the questionnaire were tested with a pilot study of 20 participants. The questionnaire's reliability test revealed a Cronbach's alpha of 0.816. The data collector read and clarified questions for any illiterate participants and recorded their responses to the questionnaire.

The data were analyzed using version 22.0 of the Statistical Package for the Social Sciences (SPSS) software (Armonk, NY, USA).^[12] In univariate analysis, we used independent Student's *t*-test for quantitative variables and Chi-square for qualitative values. To compare quantitative values across three categories, the one-way ANOVA test was used and regression analysis was used to identify predictors of headache. The cutoff point for significance was set at 0.05.

Results

A total of 1909 participants were recruited for the current study. The mean age of the group was 30.9 ± 13.7 years ranging between 18 and 89 years. Participants aged less than 20 years old formed 36.9%, and those between 21 and 40 years old made up 34.6%. Females in the study population made up 55.9%, 44.1 males, and 52% resided in urban areas. As regards the level of education, 63.3% of the population studied had a high level of education and 31.7% of population were employers. In assessing the income level of participants, 38.6% were found to have sufficient income [Table 1].

The assessment of the characteristics of the headaches revealed that as regards the frequency, and more than one-third of the study group (35.8%) suffered more than once per week from headaches. With regard to the intensity, 23.7% of the study group had severe headaches, 53.1% had moderate degree of pain, and the remaining 23.2% had mild pain. The pattern of headaches showed that 65.6% of the participants had attacks. As for etiology, in 23.7% of the study sample, no known cause was identified, but 20.2% had anemia [Table 2].

More than half of participants in the current study (63.6%) did not consult any physician for their headache. About 36% of the study participants consulted an internal medicine specialist, 33.7% consulted a neurologist, and 17.3% of the participants consulted more than one specialist. As regards management, 56.9% of the study group used over-the-counter analgesics and 30% depended on caffeine by drinking tea or coffee [Table 3].

The mean HDI score in the study group (62.8 ± 10.5) ranged between 10 and 98. As illustrated in Figure 1 outlining the disability levels of participants, 76.8% suffered from severe disability, and 19.5% showed complete disability [Figure 1].

The current study found a statistically significant association between headache disability and gender, residence, educational level, and occupation. A higher percentage of complete and severe disability was found

Table 1: Demographic characteristics of Egyptian adults in Fayoum Governorate, Egypt 2022-2023 (n=1909)

Variables	N (%)
Age (years), mean±SD (range)	30.9±13.7 (18–89)
Age groups (years)	
<20	705 (36.9)
21–40	660 (34.6)
41–60	509 (26.7)
>60	35 (1.8)
Gender	
Male	841 (44.1)
Female	1068 (55.9)
Residence	
Rural	916 (48.0)
Urban	993 (52.0)
Educational level	
Illiterate/basic	118 (6.2)
Middle	582 (30.5)
High	1209 (63.3)
Occupation	
Not working	443 (23.2)
Worker	389 (20.4)
Employer	606 (31.7)
High professional	471 (24.7)
Income	
Insufficient	660 (34.6)
Sufficient	737 (38.6)
Sufficient and saving	512 (26.8)

SD=Standard deviation

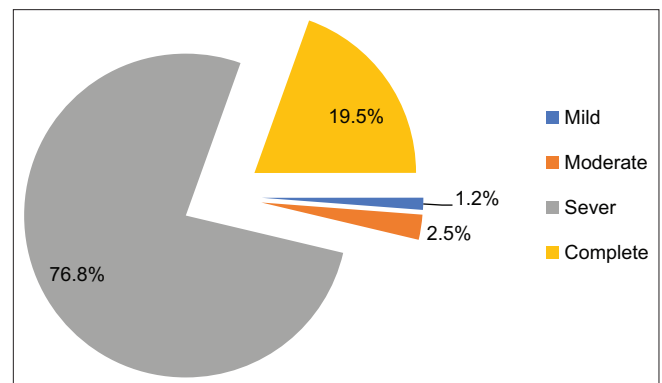


Figure 1: Frequency distribution of Egyptian adults by headache disability levels in Fayoum Governorate, Egypt 2022-2023

in females (64.9% and 53.3%), urban dwellers (51.5% and 53.1%), highly educated participants (57.4% and 65.4%), and employers (34.6% and 31.4%) [Table 4].

There was a statistically significant association between the degree of headache disability and of the frequency of the headache, severity of the pain, and the pattern of the headache. A higher percentage of participants who had complete disability consisted of those who complained of any of the following: headaches more than once per week (44.5%); moderate or greater intensity of

Table 2: Description of headache characteristics of Egyptian adults in Fayoum Governorate, Egypt 2022-2023 (n=1909)

Variables	N (%)
Headache frequency	
Once/month	588 (30.8)
1–4 times/month	637 (33.4)
More than once/week	684 (35.8)
Headache intensity	
Mild	443 (23.2)
Moderate	1014 (53.1)
Severe	452 (23.7)
Location of headache pain	
Half of head	812 (42.5)
Whole of head	871 (45.6)
Back of head	226 (11.8)
Pattern of headache	
Continuous	657 (34.4)
Attacks	1250 (65.6)
Etiology of headache	
Unknown	453 (23.7)
Anemia	386 (20.2)
Eye conditions	322 (16.9)
Diabetes mellitus	289 (15.1)
ENT	265 (13.9)
Neurogenic	91 (4.8)
HTN	88 (4.6)
Exhaustion	12 (0.6)
Sleep disturbance	3 (0.2)

HTN=Hypertension, ENT=Ear, nose and throat

Table 3: Management of headache among Egyptian adults in Fayoum Governorate, Egypt 2022-2023 (n=1909)

Variables (n=1909)	N (%)
Take physician consultation	
Yes	695 (36.4)
No	1214 (63.6)
Specialty of counseling	
Internal medicine	247 (35.5)
Neurology	234 (33.7)
>1 specialty	120 (17.3)
Ophthalmology	67 (9.6)
ENT	27 (3.9)
Way of headache management	
Analgesic	1086 (56.9)
Caffeine	572 (30.0)
Relaxation and sleep	231 (12.1)
Exercise	20 (1.0)

ENT=Ear, nose and throat

pain (47.2% and 40.2%); and complaint of attacks rather than continuous headache (55.2%) with $P < 0.001$. In addition, there was a statistically significant association between complete disability and consultation of a physician ($P < 0.001$ 50.4% cases of complete disability sought medical attention) [Table 5].

A logistic regression model was used to assess the factors that influenced the search for medical help to treat headache, and it found that older people, those who had higher education and professionals, complained of headaches more frequently, pain of greater intensity, and pain in the pattern of attacks. They also had severe to complete disability, and were more likely to seek medical advice for their complaint ($P = 0.007, 0.007, <0.001, 0.003, <0.001, 0.001, \text{ and } <0.001$ respectively).

The multivariate linear regression model presented a statistically significant association ($P < 0.001, r = 0.31, \text{ and } r^2 = 0.094$) where a higher score of headache disability was associated with living in urban areas, in professional occupations, complaint of severe headache, headache in the pattern of an attack, and asking for medical advice ($P = 0.04, 0.02, <0.001, <0.001, \text{ and } <0.001$, respectively).

Discussion

Headaches are common problems that have become an epidemic in the present day producing a notable negative impact on communities. The Global Burden of Disease Study, which was revised in 2019, rated headache disorders as the leading cause of YLD for females, the fifth for adults, and one of the top 10 causes for disability in adolescents, resulting in the escalating cost of the health expenditure.^[9] An estimated 46.6 million years lived with disability worldwide are attributed to headache disorders.^[13]

Its burden on the person's daily functions comes at a cost to the society as whole,^[14] however, the few studies done on the Egyptian population to understand it, focused on specific types of headaches.^[15,16]

In the Fayoum governorate of 4 million of mixed urban and rural population, our study sample revealed that they all had at least one headache attack per month, which highlights the extent of the problem and confirms the prevalence of more than 77.2%, and 90% in a year as revealed in previous studies.^[4,17] In the literature, there are several cases of individuals experiencing daily or almost daily headaches for months to years.^[18]

The pain was moderate to severe in more than 75% of cases and more than half had a headache in the pattern of an attack, predicting a higher score of disability as presented in our results. This underlines the detrimental effects of headaches on their health and the potential economic consequence. A third of the sample experienced more than one attack of headache per week (>4 attacks per months) with a negative impact on their daily activities and general health as it is associated with severe to complete disability. Our results were in line with

Table 4: Headache disability levels in Egyptian adults by demographic characteristics, Fayoum governorate, Egypt 2022-2023

Variables	HDI level				P-value
	Mild N (%)	Moderate N (%)	Severe N (%)	Complete N (%)	
Age groups (years)					
<20	6 (27.3)	19 (39.6)	557 (38.0)	123 (33.0)	0.06
21–40	7 (31.8)	16 (33.3)	509 (34.7)	128 (34.3)	
41–60	7 (31.8)	13 (27.1)	379 (25.9)	110 (29.5)	
>60	2 (9.1)	0	21 (1.4)	13 (3.2)	
Gender					
Male	9 (40.9)	17 (35.4)	684 (46.7)	131 (35.1)	0.001*
Female	13 (59.1)	31 (64.6)	782 (53.3)	242 (64.9)	
Residence					
Rural	17 (77.3)	30 (62.5)	688 (46.9)	181 (48.5)	0.006*
Urban	5 (22.7)	18 (37.5)	778 (53.1)	192 (51.5)	
Educational level					
Illiterate/basic	3 (13.6)	4 (8.3)	72 (4.9)	39 (10.5)	<0.001*
Middle	9 (40.9)	18 (37.5)	435 (29.7)	120 (32.2)	
High	10 (45.5)	26 (54.2)	959 (65.4)	214 (57.4)	
Occupation					
Not working	15 (68.2)	26 (54.2)	302 (20.6)	100 (26.8)	<0.001*
Worker	3 (13.6)	7 (14.6)	315 (21.5)	64 (17.2)	
Employer	2 (9.1)	14 (29.2)	461 (31.4)	129 (34.6)	
Professional job	2 (9.1)	1 (2.1)	388 (26.5)	80 (21.4)	
Income					
Insufficient	13 (59.1)	22 (45.8)	499 (34)	126 (33.8)	0.1
Sufficient	5 (22.7)	18 (37.5)	568 (38.7)	146 (39.1)	
Sufficient and saving	4 (18.2)	8 (16.7)	399 (27.2)	101 (27.1)	

*Significant difference with $P<0.05$. HDI=Headache disability index**Table 5: Headache disability levels in Egyptian adults by headache related characteristics, Fayoum governorate, Egypt 2022-2023**

Variables	HDI level				P-value
	Mild N (%)	Moderate N (%)	Severe N (%)	Complete N (%)	
Headache frequency					
Once/month	11 (50.0)	14 (29.2)	486 (33.2)	77 (20.6)	<0.001*
1–4 times/month	6 (27.3)	19 (39.6)	482 (32.9)	130 (34.9)	
More than once/week	5 (22.7)	15 (31.3)	498 (34.0)	166 (44.5)	
Headache pain severity					
Mild	6 (27.3)	12 (25.0)	378 (25.8)	47 (12.6)	<0.001*
Moderate	14 (63.6)	26 (54.2)	798 (54.4)	176 (47.2)	
Severe	2 (9.1)	10 (20.8)	290 (19.8)	150 (40.2)	
Pattern of headache					
Continuous	3 (13.6)	5 (10.4)	482 (32.9)	167 (44.8)	<0.001*
Attacks	19 (86.4)	43 (89.6)	984 (67.1)	206 (55.2)	
Take physician consultation					
Yes	2 (9.1)	17 (35.4)	488 (33.3)	188 (50.4)	<0.001*
No	20 (90.9)	31 (64.6)	978 (66.7)	185 (49.6)	

*Significant difference with $P<0.05$. HDI=Headache disability index

previous studies which demonstrated that the severity, pattern, and frequency of headaches had a significant role in determining the patients' disability.^[19,20]

In the current research group, headaches resulted in a complete disability rate of 19.5%, severe disability rate of

76.8%, moderate disability rate of 2.5%, and mild disability rate of just 1.2%. According to a survey in Pakistan, 24% of people had severe headache disabilities and 70.2% had moderate disabilities.^[21] In a Kuwaiti study, about 11.5% of the people studied had a severe level of headache disability and 42% had a moderate level of headache disability.^[22]

In our study, several sociodemographic characteristics showed an association with headache disabling effect. Females had a higher percentage across all disability index levels, while older person tended to have less disability levels, which is consistent with other studies findings.^[17,23,24] In rural residents, a mild form of disability was more common (77.3%) while urban residents tended to have severe and complete disabling headaches, results which are similar to previous studies in Egypt showing a higher prevalence of different types of headaches in urban areas^[15] attributable to an unhealthier lifestyle and work stress related to urban life.^[5,25]

A higher percentage of severe and incapacitating headaches was found in participants who were employed or had professional jobs. Since these people tended to live in urban areas, there could be a synergistic effect in the increase of disability levels. In the pathophysiology of headache, occupational factors may be quite important. Heavy workloads, prolonged periods of high tension are common in professional occupations.^[26]

Even though 76.8% of the sample suffered from either moderate or severe attacks, only 36.4% sought medical advice whether from a specialist or general practitioner; only a small number (17.3%) consulted more than one specialist. Our findings were consistent with a previous study in which the majority of sufferers, especially people with low incomes and little education chose to self-treat rather than seek medical advice.^[14,27]

Most participants attributed the cause of headache to an underlying condition, most commonly eye disorders, diabetes, and anemia, while only a quarter of the studied group said they did not know the cause. These findings might explain the low rate of medical consultation for headaches. Worldwide, about 40% of persons with migraine or tension type headache and only 10% of those with medication overdose headache receive expert diagnosis and treatment for their headache.^[1]

Many obstacles prevent people with headache disorders from receiving the proper care they need. These include a lack of knowledge of headache disorders by the general public and healthcare providers, a lack of access to specialized services and basic investigations for headache disorders, a lack of treatment options, unclear medical history, as well as the lack of information on the most effective methods for screening for secondary headaches in populations where the prevalence of headache disorders is high.^[28]

The treatment for primary headaches varies depending on the severity of the symptoms and level of disability.

Initial treatments for minor and infrequent symptoms may include lifestyle changes, dietary changes, and stress reduction methods. If necessary, prescription drugs may be added to assist the prevention of disability and preserve functions.^[18]

To manage their headache, half of the participants, a percentage which is close to those reported in previous studies, used regular analgesics.^[27] Contrary to previous findings in which increased coffee intake was significantly linked to migraine and tension-type headache, caffeine was used by 30% of participants to treat headache, with a nearly double relative risk.^[5] Other forms of headache management revealed in our study were rest, exercise, and sleep even when the disability index was high. This can be attributed to the little education and low income of those who have limited access to adequate headache management because they do not seek medical attention.^[27]

The current study showed a statistically significant relationship of high level of disability and seeking medical advice with living in urban areas, having professional jobs, and severe headaches characterized by patterns of attack. This was in line with research that found that some demographic groups who experienced headache disability more frequently were individuals with high-incomes, residents, participants between the ages of 25 and 40, females, married individuals, those with chronic diseases, and those with postgraduate degrees.^[22]

The current study had limitations. Every attempt was made to achieve a representative sample. However, more participants had higher education than their percentage in the population. To overcome their effect, categorization were used. Ages were not distributed similarly to the population and younger age was underrepresented. However, its effect was minimal as most of the headache sufferers tended to be between 40 and 60 years. Some of the known risk factors were not assessed because of limited resources and the difficulty of collecting accurate information. However, the fact that all participants complained of headaches necessitate further in-depth studies, which is outside the scope of this paper.

Conclusion

Our study showed that a headache is a condition that affects the entire population in a way that affects their daily activities and quality of life since it causes high levels of disability. It both affects such vulnerable groups as females and productive groups impacting on their quality of life and causing financial hardship. However, people tend not to seek medical advice and self-treat

with regular analgesics or even traditional methods. Despite the unquestionably high burden of headaches, the quality healthcare provided for headaches and its utilization are very poor. To reduce its negative impact on population health, adequate management that focuses on increasing education awareness of the population and providing essential care is crucial. Both of these are feasible at the primary care level at minimal cost and scant use of resources.

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Conflicts of interest

There are no conflicts of interest.

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