Original Article

Prevalence, treatment-seeking behavior, and cost of Headaches: a descriptive study from Iran

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Abstract

Background: This study was conducted with the intention of evaluating the prevalence of headache disorders in Tehran, assessing medical seeking behavior and costs endured by individuals affected, and compare them between men and women.

Method: A cross-sectional study was conducted including individuals aged 18 and older from general population of Tehran through stratified random sampling method. Information on demographic characteristics, headache features, medical help seeking behaviors, medications used, and economic cost endured were collected through a self-administered structured questionnaire. The characteristics of the study population were presented using descriptive analysis. Chi-squared test and Independent T test were performed to compare the variables between sexes.

Result: Data on 523 adult participants were analyzed. Main findings showed a prevalence of 96% for all headaches in adults, including 47.9 % (n = 241) women and 52.1% (n = 262) men. Mostly described their headache as a squeezing sensation (32.8 %) felt bilaterally (78%) with medium intensity (59%). About a third (31%) reported reduced productivity due to headache. The prevalence of self-treatment was 75% in study population and about two third reported using medications for acute treatment of headache. Mean± SD out of pocket payment of US$139 ± 114.6, and average monthly expenditure of US$4.1 ± 13.4 for headache management purposes were documented. No significant differences were found between the sexes in terms of headache features, treatment-seeking behaviors, and headache management expenditures.

Conclusion: Findings point to the importance of prioritizing headache disorders in future decision-making and resource allocation strategies.

Keywords: Headache; Health Care Costs; Iran; Prevalence; Treatment.

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Introduction

Headache is one of the most prevalent neurological disorders worldwide. Globally, about three billion individuals have had a headache disorder in year 2016. (1) Headaches could cause substantial levels of disability for

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those who are affected. According to the Global Burden of Disease (GBD) study in 2015, headaches were collectively accounted as the third cause of disability in adults under the age of 50. (2) Yet, since headache disorders were not fatal, nor permanent their importance as a major public health concern has only been recognized in the year 2000. Thus, headache prevalence and its burden are not well described in many regions of the world including Iran. (3)

In Iran, headache was considered as the most prevalent neurological disorder in year 2017 with significant disease burden in terms of disability- adjusted life-years (DALYs). (4) The prevalence of all headaches was estimated at 78% in adults with migraine being the most common type. (5) In addition to the impact that headache disorders have on individuals' quality of life, they impose a significant economic burden on headache sufferers and the society. The economic burden is generally caused by costs associated with doctors' visits, medications, imaging, and loss of productivity. (6, 7) Despite the high prevalence and economic burden, few studies have assessed the topic in Iran. Hence this study was conducted with the intention of evaluating the prevalence of headache disorders in Tehran, assessing medical seeking behaviour and costs endured by individuals affected, and compare them between men and women.

Method

A cross-sectional study was conducted by recruiting individuals aged 18 and older from general population of Tehran through stratified random sampling method. Tehran is the capital and the most populated city of Iran. To include people from all socio-economic strata, the city was divided into five geographic regions according to a recent study performed on socio-economic of Tehran citizens. In each region, four main parks were selected, and one was randomly chosen out. The sample size was estimated based on total population in each region considering 95% confidence interval and p value of 0.05. Hence, a minimum sample of 255 individuals were needed including 68 participants from North, 44 from South, 78 from east, 35 from west, and 30 from central region of the city. Data collection was performed by researchers during weekdays starting from 7:00 am and ending at 8:00 pm.

Individuals 18 and older willing to participate were enrolled in the study after informed consent was obtained verbally. Information on demographic characteristics, headache features, headache-induced disabilities, medical help seeking behaviors, medications used, and economic cost endured were collected through a self-administered structured questionnaire. A structured questionnaire was developed by modifying and translating MIDAS questionnaire and the one used in EUROLIGHT study. Questions were mostly categorical, however, the questionnaire included numerical and open questions as well.

Variables

Variables used included age, sex, education, marital status, insurance status, history of headache in the past three months, headache type, headache location, headache intensity, reduced productivity in daily routines, headache Treatment-seeking behaviors, use of medications, blood test, X-ray, electroencephalogram (EEG), computerized tomography (CT), magnetic resonance imaging (MRI), eye exam, Out of Pocket Payment (OPP) associated with blood test, OPP associated with X-ray, OPP associated with EEG, OPP associated with CT, OPP associated with MRI, OPP associated with eye exam.

Statistical Analysis

The characteristics of the study population were tabulated and presented using descriptive analysis. Chi-squared test was used to compare the proportions of categorical variables between sexes. Cost

Table 1. Study population's characteristics.

Characteristics		Women n (%)	Men n (%)	Total n (%)	P-value
Age (years)	18-35	79 (32.8)	88 (33.6)	167 (33.2)	0.53
	36-55	72 (29.9)	67(25.6)	139 (27.6)	
	≥ 56	90 (37.3)	107 (40.8)	197 (39.2)	
Education	Primary	109 (45.2)	109 (41.6)	218 (43.3)	0.53
	Secondary	93 (38.6)	114 (43.5)	207 (41.2)	
	Tertiary	39 (16.2)	39 (14.9)	78 (15.5)	
Marital Status	Single/divorced/widowed	108 (44.8)	128 (48.9)	236 (46.9)	0.36
	Married	133 (55.2)	134 (51.1)	267 (53.1)	
Insurance	uninsured	14 (5.8)	15 (5.7)	29 (5.8)	0.96
	insured	226 (94.2)	246 (94.3)	472 (94.2)	

was converted to US dollars (US$) using the purchasing power parity (PPP) exchange rate in 2018 (US$1 = Rial 16,772). (8) Independent T test was performed to compare the total OPP associated with para-clinical tests and monthly OPP associated with management of Headache between women and men. Statistical analyses were performed using IBM SPSS Statistics, version 27 (IBM Corp., Armonk, N.Y., USA), with significance level of $\alpha < 0.05$.

Ethics approval and consent to participate

Shahid Beheshti University of Medical Sciences Ethics Committee approved the study (Reference number: IR.SBMU.MSP.REC.1398.160). Data were de-identified prior to analysis. All methods were performed in accordance with the Declaration of Helsinki guidelines and regulations.

Result

In total, data on 523 adult participants were analyzed. Of those, 96.1% (n = 503) reported experiencing headache in the past year. The mean age ± SD of participants with positive history of headache in the past year, was 47.6 ± 17.35 years (range 18-81 years), including 47.9 % (n = 241) women and 52.1% (n = 262) men. Characteristics of the study population is provided in Table 1.

Table 2 summarizes clinical features of headache reported by study participants. Majority of participants (63%) had 5 or less episodes of headache during the last 3 months. Mostly described their headache as a squeezing sensation (32.8 %) felt bilaterally (78%) with medium intensity

Table 2. Headache characteristics in study population.

Characteristics		Women n (%)	Men n (%)	Total n (%)	P-value
Frequency in past 3 months (days)	0-5	147 (61.0)	174 (66.4)	321 (63.8)	0.31
	6-20	71 (29.5)	71 (27.1)	142 (28.2)	
	≥ 20	23 (9.5)	17 (3.4)	40 (8.0)	
Type	Pulsating	68 (28.2)	63 (24.0)	131 (26.0)	0.55
	Squeezing	79 (32.8)	86 (32.8)	165 (32.8)	
	Sharp	12 (5.0)	19 (7.3)	31 (6.2)	
	Dull	18 (7.5)	15 (5.7)	33 (6.6)	
	Other	64 (26.6)	79 (30.2)	143 (28.4)	
Location	Unilateral	50 (20.7)	60 (22.9)	110 (21.9)	0.55
	Bilateral	191 (79.3)	202 (77.1)	393 (78.1)	
Intensity	0-3	70 (29.0)	94 (35.9)	164 (32.6)	0.19
	4-7	148 (61.4)	150 (57.3)	298 (59.2)	
	8-10	23 (9.5)	18 (6.9)	41 (8.2)	
Interrupted daily routines	No	158 (65.6)	187 (71.4)	345 (68.6)	0.16
	Yes	83 (34.4)	75 (28.6)	158 (31.4)	

Table 3. Treatment-seeking behaviors associated with headache management in study population.

Characteristics		Women n (%)	Men n (%)	Total n (%)	P-value
Headache Management	Self-Treatment	173 (71.8)	204 (77.9)	377 (75.0)	0.06
	General Practitioner	27 (11.2)	32 (12.2)	59 (11.7)	
	Specialist	20 (8.3)	16 (6.1)	36 (7.2)	
	Alternative Medicine	16 (6.6)	6 (2.3)	22 (4.4)	
	Pharmacy	5 (2.1)	2 (0.8)	7 (1.4)	
	Emergency rooms	0 (0.0)	2 (0.8)	2 (0.4)	
Use of medications	No	71 (29.5)	89 (34.0)	160 (31.8)	0.27
	Yes	170 (70.5)	173 (66.0)	343 (68.2)	

(59%). About a third (31%) reported reduced productivity due to headache. The prevalence of self-treatment was 75% in study population and about two third reported using medications for acute treatment of headache. Treatment-seeking behaviors of participants for headache management were shown in Table 3.

Mean± SD OPP was US$139 ± 114.6, US$141 ± 103.5 for men and US$138 ± 122.5 for women. Independent t-test revealed no significant difference between the sexes in their total OPP on headache management ($t_{129} = 0.121$, P value: 0.90). Moreover, participants reported spending on average US$4.1 ± 13.4 per month for headache management expenses (3.9 ± 16.5 for men and 4.3 ± 9.0 for women). There was no significant difference in monthly payments between men and women in independent T test either ($t_{501} = -0.305$, P value: 0.76).

Discussion

A cross-sectional study was conducted by analyzing data on 523 adult participants who were recruited from general population of Tehran through stratified random sampling method. The main findings showed a prevalence of 96% for all headaches in adults. Most participants (75%) reported practicing self-treatment for headache management. Mean± SD OPP of US$139 ± 114.6, and average monthly expenditure of US$4.1 ± 13.4 for headache management purposes were documented. No significant differences were found between the sexes in terms of headache features, treatment-seeking behaviors, and headache management expenditures.

Our study showed a prevalence of 96% for headache among adults. The observed rate was higher than the rates reported in United States of America (76%), Norway (77%), Turkey (70%), Europe (50 %), and Japan (28%). (9) Generally, a variety of environmental factors have been identified as possible triggers of headache including air quality. (10) The megacity of Tehran is one of the most air polluted cities in the world with over 100 days of unhealthy air quality and only few weeks of clean air each year. (11) This could partly justify the

Table 4. Out of Pocket Payment associated with headache management in study population.

Tests	Women n (%)	Men n (%)	Total n (%)	P-value	OOP Payment (US$) Mean ± SEM
Blood Test	19 (7.9)	13 (5.0)	32 (6.4)	0.18	77.2 ± 11.17
Cranial X-ray	6 (2.5)	1 (0.4)	7 (1.4)	0.04	79.5 ± 23.85
EEG	5 (2.1)	4 (1.5)	9 (1.8)	0.64	56.9 ± 16.47
CT	18 (7.5)	13 (5.0)	31 (6.2)	0.24	116.3 ± 8.21
MRI	29 (12.0)	18 (6.9)	47 (9.4)	0.04	145.4 ± 9.75
Eye exam	45 (18.7)	37 (14.2)	82 (16.3)	0.17	56.5 ± 5.57

OPP: Out of Pocket Payment; US$: United States Dollars: SEM: Standard Error of Mean.

higher prevalence of headache in our study compared with results reported from most developed regions of the world. Moreover, living in megacities per se is associated with higher rates of poor mental health and increased risk of psychological comorbidities containing anxiety and depression which are widely known as important triggers of headache. (12, 13)

Overall, over a third (31%) of participants reported impaired daily life activity due to headache. Whereas studies conducted in India and Japan found headache related productivity loss of about 83% and 73% respectively. (14, 15) The reason for the observed inconsistency was not completely clear to the researchers and further evaluations may be needed on this issue. However, one possible explanation could be the fact that our study population covers a wide age range (18-80 years) while others limit their participants to those in the most productive age years (25-60 years) that could magnify the burden of the headache.

In terms of treatment-seeking behaviors associated with headache management, about 12% of the study population have been visited by a general practitioner for their headache, which was lower than the findings reported from Denmark (22%) and United Kingdom (UK) (34%). Over 7% of participants have been seen by a specialist. Though this result was in line with rate from Denmark (6%), it was higher than the rate reported from UK (4%). Overall, 68% had reported use of medications in order to manage their headache, which was lower than the previous results reported in the literature. However, about 22% had used alternative medicine which was higher than the findings reported in the literature. (16, 17)

With respect to sex disparities, unlike other research carried out in this area, we did not find significant difference between men and women in their headache manifestations as well as reported productivity loss due to headache. (18-20) No significant difference was observed for treatment-seeking behaviors and proportion of participants taking medications for headache management either. However, we found that higher proportion of women had undergone cranial X-ray and MRI than men to find underlying conditions associated with headache. Yet, there are inconsistent reported results in the literature in terms of disparities in service use among men and women. (21, 22)

Finally, there are a number of potential limitations that need to be considered. First, the study was a cross-sectional study, hence evaluating causal effects were not possible. Second, data on use of services and amount of OPP were collected with questionnaire which could prone our analysis to recall bias.

Conclusion

Our study showed a high prevalence for headache disorders in Tehran. In addition, it revealed the medical seeking behavior of headache sufferers and the significant amount of OPP spending associated with headache management efforts. The findings point to the importance of prioritizing headache disorders in future decision-making and resource allocation strategies.

Authors' contributions

Each named author has substantially contributed to conducting the research and drafting this manuscript. RA was the main researcher and involved in study design, literature search, data analysis, data interpretation, article drafting and finalizing the manuscript. SS was involved in data collection, data cleaning, study design, data interpretation and article drafting. MRS was the head of team and involved in study design, literature search, data analysis, data interpretation, article drafting and finalizing the manuscript.

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Competing interests

The authors declare that they have no competing interests.

Informed Consent

Informed consent was obtained verbally from all Individuals 18 and older willing to participate in the study.

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