

A review indicating the migraine headache as a prevalent neurological disorder: Still under-estimated, under-recognized, under-diagnosed and under-treated

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Abstract

Background and objectives: The migraine headache is a chronic and sometimes progressive neurological disorder that can be characterized as the recurrent episodes of headaches and related symptoms. Migraine headache syndrome is considered extremely prevalent all over the globe, but it is still under-estimated, under-recognized, under-diagnosed and under-treated. The objective of this review was to demonstrate the global prevalence of migraine, and to explore the reasons why this prevalent and disabling neurological disorder is under-estimated, under-recognized, under-diagnosed and under-treated. **Methods:** We used a number of electronic databases to identify the relevant published studies which demonstrated the prevalence of migraines, and barriers of poor migraine headaches care. We included general population-based studies on the prevalence of migraine headache if they fulfilled the following criteria; (1) a reliable data collection method (e.g., personal interview, telephonic interview and questionnaire) and (2) the use of the International Headache Society's (IHS) criteria (1988 or 2004) for migraine headache diagnosis.

Results and conclusions: Of 539 articles found initially, 237 were selected for additional review. Subsequently, 90 articles were included in the final analysis. This review concluded that the migraine headache influenced 11.4% (7.9% males and 14.8% females) worldwide. The hurdles accountable for poor migraine headache care vary all over the globe, and could be categorized as societal, clinical, financial and political. By having concentrations on such hurdles, this problem could be lessened, and headache relief will be able to gain the priority that it deserves.

Key Words: Migraine; Headache; Migraine prophylaxis; Epidemiology; Migraine prevalence; Migraine disability; Migraine care barriers

INTRODUCTION

The headache is one of the most common disorders of the nervous system, having several subtypes- migraine headache, tension-type headache and cluster headache. Amongst these, the migraine headache is ubiquitous, prevailing, disabling and essentially treatable, but still under-estimated, under-recognized, under-diagnosed and under-treated.^[1] The migraine headache definitely has hereditary foundations,^[2] but biological aspects play a substantial role in how the illness distress those who endure it. Patho-physiologically, the initiation of a mechanism profound in the brain produces a discharge of pain-creating inflammatory substances in the region of blood vessels and the nerves of the brain.^[3,4] Why this occurs episodically and what are the causes



of the resolution of attacks is undefined.

According to World Health Organization (WHO), the migraine is the main cause of the headache burden around the globe and recognized amongst the 20 leading causes of disability worldwide.^[5] Published studies have demonstrated that migraines have an effect on people of all ages, income levels, races and geographical regions.^[1,6,7] With the introduction of the mutual Global Campaign to diminish the headache burden by the International Headache Society (IHS), the World Headache Alliance (WHA), the European Headache Federation and WHO, an appreciable motivation on the supervision of migraine headaches was anticipated. In this regard, the WHA led campaign allies and established a worldwide observatory of headache disorders to develop an understanding of region-based complications and directed efforts accordingly.

Most neurological disorders are not different regionally regarding prevalence, diagnosis and management, but the migraine is a complex neurological disorder, the end result of which can fluctuate depending upon location-specific variables.^[8] In contrast to developed countries, there are many more barriers to headache care in developing countries that make migraine management complicated. The objective of this review was to demonstrate the global prevalence of migraine, and to explore the reasons why this prevalent and disabling neurological disorder is under-estimated, under-recognized, under-diagnosed and under-treated.

METHODS

A comprehensive literature search (studies published from 2001 to 2016) was conducted from Embase, EconLit, Google Scholar, Medline, PubMed, ProQuest, Scopus, Springer Link and Science Direct databases. “Migraine”, “Headache”, “Prevalence”, “Migraine prophylaxis”, “Epidemiology”, “Migraine prevalence”, “Migraine disability” and “Migraine care barriers” were used as keywords in diverse combinations with BOOLEAN and MeSH searches.

Further publications were recognized by a manual search of references of related papers, and review articles were also cited where applicable. Initially, 539 studies were retrieved. Out of these, 182 were duplicates and therefore were excluded. Out of 357 remaining articles, 120 were dropped based on an irrelevant title and/or abstract. Subsequently, the full texts of 237 articles were read and 140 studies were further removed as these failed to provide relevant details. Finally, 90 articles were selected for this review (Figure 1).

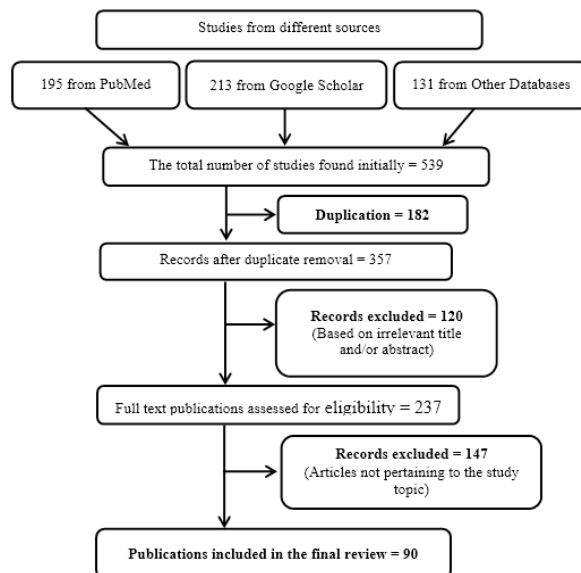


Figure 1: Schematic diagram explaining the assortment of studies/reports.

We included general population-based studies on the prevalence of migraine headaches if they fulfilled the subsequent criteria: (1) a reliable data collection method (e.g., personal interview, telephonic interview and questionnaire), and (2) the use of the IHS criteria (1988 or 2004) for migraine headache diagnosis. For reporting the prevalence of migraines, we extracted the country of origin, study time frame, data collection method, population characteristics (sample size and age range), and the overall and gender-based prevalence estimates from the selected studies. Before selecting studies of our concern, all articles were analyzed for different attributes of methodology and design as well as the type of content by two independent reviewers to minimize the risk of biasness. If more than three studies were available from a single country, then the most recent studies were selected. Studies based on specific populations, (e.g., in workplaces, clinic-based, among university students, etc.) were excluded because of varying levels of stress and the subsequent probability of migraines. As school attendance is mandatory in many countries, studies on migraine headache in children and teenagers of school age based on school populations were included.

RESULTS AND DISCUSSION

This section comprises two sub-sections. The first part describes the global prevalence of migraine headaches, and the second part enlists the different barriers related to migraine headache care which could lead to its under-estimation, under-recognition, under-diagnosis and under-

treatment.

Global prevalence of migraine headaches

The universal epidemiology of the migraine headache is partially renowned.^[7] Additionally, a few population-based studies from developing countries where restricted financial support and under reporting of migraine headache illnesses have occurred in comparison with infectious diseases, have averted the systematic assembly of information. However, regardless of regional variations, migraine headache syndrome is extremely prevalent all over the globe and current surveys affix assistance to this faith.^[6] This review enlightened us in the meantime that migraine headaches influenced 11.4% (7.9% males and 14.8% females) worldwide. Extrapolation of facts for migraine headache occurrence and attack frequency advocate that 3,000 migraine incidents take place each day for every million people of the general population.^[6]

The migraine headache is largely immobilizing populations aged 35–45 years, though it can be a dilemma for a much younger population.^[9] In the United Kingdom (UK), for instance, approximately 25 million school-days are misplaced each year as a consequence of migraine headache alone.^[6] In the Global Burden of Disease Study, individually the migraine headache was discovered to represent 1.3% of all Years Lived with Disability. Investigations in the United States (US) and Europe revealed that migraine headaches influenced 6–9% of men and 15–19% of women.^[6,10] A survey in the Russia indicated an even larger prevalence: 14.9% in men and 38.1% in women.^[11] The higher rates in women all over (2–3 times those in men) could be hormonally motivated.^[1] Similarly, in Pakistan even though key studies are yet to be performed, anecdotal facts indicated that the migraine headache is enormously frequent. In Table 1, we have summarized the region-based prevalence of migraine headaches.

Why is the migraine headache under-estimated, under-recognized, under-diagnosed and under-treated?

The hurdles accountable for poor migraine headache care vary all over the globe, but they might be categorized as societal, clinical, financial and political.

Societal barriers

Many stakeholders considered that the migraine is the least important and incurable public health problem. These stakeholders include insurance companies, health care professionals, organizations that fund biomedical research,

employers and migraine enduring patients and their families. Such barriers can cause hurdles at interpersonal levels as well as at a society level that can be conceptualized at various levels of structure, process and outcome.^[84] Insignificant recognition of migraine headache is increasing in the general community. Migraine headache complaints are not considered by the community as critical while they are frequently recurring, because they do not trigger casualties and are non-infectious.^[1] Actually, migraine headaches are frequently under-estimated as “normal”, a negligible annoyance or an escape from responsibility.^[1]

Myths and misunderstandings regarding headaches, ignorance about their treatment and patients’ own presumptive diagnosis are some barriers to migraine headache care.^[85] The major reason of migraine headache is low literary rates. Due to low literacy rates, people cannot understand migraines and do not receive appropriate treatment. Subsequently, they have to face persistent headaches.^[5] Many patients do not recognize the value of trigger-control measures and are not certain about permanent treatments for migraine headache. These critical societal barriers restrain people who may perhaps otherwise search for help from doctors, regardless of what may be elevated levels of throbbing pain and disability.^[1]

The understanding of migraines is low among those who suffer from this disease. A Japanese survey discovered, for instance, that various patients were ignorant that their headaches were migraine, or that this was a particular disorder requiring medical consideration.^[86] The negligible consultation ratios in developed nations may reveal that various migraine headache victims are ignorant that successful treatments survive.^[1]

Migraine headaches must designate a public health interest. Until now there is worthy evidence that awfully significant numbers of people concerned, even immobilized by migraine headaches, do not obtain efficient health care. For instance, in demonstrative illustrations of general residents of the UK and the US, just half of the individuals recognized with migraine headache visited a physician for headache-associated causes and merely two thirds were properly diagnosed. The majority was exclusively dependent on over-the-counter medicines, without gaining access to prescription medications.^[87] According to a survey of 101 countries by WHO (surveyed from October 2006 until March 2009), a national specialized association for headache ailments (or a headache division in an alternative organization) subsisted in two thirds of responding countries.^[9] Just one third of specialized headache associations organized conferences, introduced understandings of headache-

Table 1: Prevalence of migraine headache in different regions of the world

Country	Time frame	Method of data collection	N	Age range (Years)	Male %	Female %	Total %	Reference
North America								
Canada	L.t.	T.i.	2922	>18	7.8	24.9	17.1	[12]
Canada	1 Year	Q, P.i.	22720	0-65	4.7	11.8	8.3	[13]
United States	1 Year	Q	162,576	>12	5.6	17.1	11.7	[14]
United States	1 Year	P.i.	10,918	4-18	15.1	19.1	17.1	[15]
United States	1 Year	T.i.	27,157	>18	9.0	18.9	14.1	[10]
Average					8.44	18.36	13.66	
Europe and Central Asia								
Austria	1 Year	P.i.	997	≥15	6.1	13.8	10.2	[16]
Belgium	1 Year	Q, P.i.	1071	20-69	17.9	33.9	25.8	[17]
Croatia	L.t.	P.i.	3794	15-65	14.8	22.9	19.0	[18]
Denmark	1 Year	P.i.	27	25-36	5.4	23.5	14.5	[19]
Denmark	1 Year	Q, P.i.	28,195	12-41	13.9	24.3	19.1	[20]
Finland	1 Year	Q	3580	8-9	3.0	2.3	2.7	[21]
Finland	6 months	Q	3580	8-9	2.5	3.2	2.7	[22]
France	L.t.	Q, P.i.	10585	≥15	4	11.2	7.9	[14]
France	N.S.	Q	10,532	≥18	6.3	15.7	11.2	[23]
Georgia	1 Year	Q	1145	≥16	10.8	18.8	15.6	[24]
Germany	1 Year	T.i.	7341	≥18	5.3	15.6	10.6	[25]
Germany	2 Year	Q, P.i.	5350	18-65	11.3	23.9	17.9	[26]
Greece	1 Year	Q	3509	4-15	5.2	7.3	6.2	[27]
Hungary	1 Year	Q	813	15-80	2.7	6.9	9.6	[28]
Italy	1 Year	Q, P.i.	1445	11-14	2.7	3.3	3	[29]
Italy	1 Year	P.i.	1031	≥65	2.3	6.4	4.4	[30]
Italy	1.5 Year	P.i.	904	≥18	13.0	32.9	24.7	[31]
Netherlands	L.t.	Q	6491	20-65	13.3	33.0	23.2	[32]
Norway	L.t.	Q	21177	20-80	18.1	34.1	26	[33]
Norway	1 Year	Q	39690	>20	7.4	14.9	12	[34]
Norway	1 Year	Q, P.i.	493	12-18	15.1	26.8	23.0	[35]
Poland	1 Year	Q	2352	15-19	10.0	28.4	21.7	[36]
Russia	1 Year	Q, P.i.	2025	18-65	14.9	38.1	23.8	[11]
San Marino	1 Year	Q	1500	>7	9.3	18.0	13.6	[37]
Serbia	L.t.	P.i.	1259	7-12	2.1	4.6	3.3	[38]
Serbia	N.S.	Q, P.i.	30636	3-17	8	9.6	8.6	[39]
Spain	1 Year	Q, P.i.	29,478	>16	5.91	15.94	11.0	[40]
Spain	1 Year	P.i.	16079	16-80	7.1	17.8	12.5	[15]
Spain	1 Year	T.i.	712	18-65	8	17.2	12.6	[41]
Sweden	1 Year	Q	1668	18-74	9.5	16.7	13.1	[42]
Sweden	1 Year	Q, P.i.	1371	7-15	9.8	12.2	11.0	[43]
Sweden	3 months	Q	43,770	18-79	2.4	5.5	4.0	[44]
Turkey	1 Year	Q, P.i.	5323	18-65	8.5	24.6	16.4	[45]
Turkey	1 Year	P.i.	1385	11-18	23	29.5	18.9	[46]
Turkey	1 Year	Q	3001	18-70	12.4	21.6	16.7	[47]
UK	1 Year	Q	2165	5-15	9.7	11.5	10.6	[48]
UK	1 Year	T.i.	4007	16-65	7.6	18.3	14.3	[6]

Continued....

Table 1: Cont'd					8.90	17.95	13.55	
Average					8.90	17.95	13.55	
Latin America and Caribbean								
Argentina	1 Year	Q	>500	≥15	3.8	6.1	5.0	[49]
Brazil	1 Year	P.i.	1994	5-12	4	3.6	3.8	[13]
Brazil	N.s.	P.i.	5671	5-12	8.4	9.6	9	[19]
Brazil	1 Year	Q, P.i.	1856	5-11	22.3	23.7	23	[50]
Chile	1 Year	Q	1385	≥15	2.0	11.9	7.3	[51]
Chile	1 Year	Q	51383	≥20	7.4	16.1	11.75	[52]
Colombia	1 Year	Q	>500	≥15	4.8	13.8	9.3	[49]
Ecuador	1 Year	Q	>500	≥15	2.9	13.5	8.2	[7]
Mexico	1 Year	Q	>500	≥15	3.9	12.1	10.0	[49]
Peru	1 Year	P.i.	3246	≥15	2.3	7.8	5.3	[53]
Puerto Rico	1 Year	T.i.	1610	All ages	6.0	16.7	13.5	[54]
Venezuela	1 Year	Q	>500	≥15	4.7	12.2	8.5	[7]
Average					6.04	12.26	9.55	
Sub Saharan Africa								
Benin	L.t.	P.i.	1113	>15	2.21	3.97	3.32	[55]
Ethiopia	L.t.	Q, P.i.	2151	18-60	6.94	14.29	9.86	[56]
Ethiopia	1 Year	Q, P.i.	231	≥15	9.24	10.7	9.96	[57]
Nigeria	1 Year	Q	1679	11-18	9.19	18.17	13.46	[58]
Tanzania	1 Year	Q, P.i.	3351	>10	2.51	6.9	5	[59]
Tanzania	1 Year	Q	7412	0-81	2.17	6.32	4.26	[60]
Zambia	1 Year	Q, P.i.	1085	18-65	18.0	27.1	23.3	[61]
Zimbabwe	1 Year	Q	5028	5-60	3.51	5.99	4.18	[62]
Average					6.72	11.68	9.17	
East Asia and Pacific								
China	1 Year	Q, P.i.	5041	18-65	5.9	12.8	9.3	[63]
Hong Kong	N.S.	T.i.	1436	≥15	3.0	6.2	4.7	[64]
Japan	1 Year	Q	4795	≥15	2.3	9.1	6.0	[65]
Japan	N.s.	Q	6472	12-15	3.3	6.5	4.8	[30]
Korea	1 Year	Q	5039	6-18	7	10.3	8.7	[66]
Korea	1 Year	Q, P.i.	1507	19-69	3.2	8.8	6.0	[67]
Malaysia	1 Year	Q	561	≥5	6.7	11.3	9.0	[68]
Singapore	N.S.	Q	205	10-19	3.7	2.0	2.9	[69]
Singapore	L.t.	Q	2873	6-16	7.9	9.2	8.6	[70]
Taiwan	1 Year	Q	3377	≥15	3.4	11.2	7.7	[71]
Taiwan	1 Year	Q	7658	13-15	5.9	9.1	7.4	[72]
Thailand	L.t.	Q	1789	12-15	11.8	16.2	13.9	[73]
Thailand	3 months	Q, P.i.	953	12-14	8.9	13.8	12.2	[74]
Average					5.62	9.73	7.79	
Middle East and North Africa								
Egypt	1 Year	Q, P.i.	2375	15-83	13.9	20.12	17.3	[75]
Iran	1 Year	P.i.	2226	6-13	1.4	2.1	1.7	[33]
Iran	N.s.	Q, P.i.	930	12-15	15.6	8.9	12.3	[42]
Iran	1 Year	P.i.	2076	12-65	21.6	36.7	27.6	[76]
Jordan	2 Year	Q	4836	18-50	8.3	6.8	7.7	[77]
Oman	2 Year	Q	1158	>10	4.5	5.6	5.1	[78]

Continued....

Table 1: Cont'd

Qatar	3 months	P.i.	913	18-60	7.8	8.0	7.9	[79]
Saudi Arabia	1 Year	Q	1181	6-18	6.5	7.7	7.1	[48]
Saudi Arabia	1 Year	P.i.	1158	>10	4.5	5.6	5.1	[80]
Tunisia	N.S.	T.i.	34,874	0-100	2.5	4.5	3.4	[81]
Average					8.66	10.60	9.52	
South Asia								
India	L.t.	Q	1305	11-17	9	14	11	[52]
India	1 Year	Q, P.i.	2329	18-65	19.4	32.8	22.8	[82]
Nepal	1 Year	Q, P.i.	2100	18-65	11.8	22.8	17.8	[83]
Average					13.4	23.2	17.2	
Overall prevalence					7.93	14.76	11.43	

N.s. = Not stated; L.t. = Life-time; P.i.= Personal interview; T.i. = Telephone interview; Q = Questionnaire

correlated concerns or were engaged in establishing guidelines in the execution of headache complaints. Fewer (20%) specialized headache associations played a part in the composition of postgraduate educational curriculum and merely 10% did so in the composition of an undergraduate curriculum on headaches.^[9] The WHO survey also concluded that facts on the societal effect of migraine headaches persisted in just 18% of responding countries. Appliances to evaluate the impact of migraine headaches were utilized routinely in just 24% of responding countries, and very little in low-income or lower middle countries. The WHO survey^[9] concluded that all of these societal barriers would lead to inadequate migraine headache care. A summary of societal barriers is presented in Table 2.

Clinical barriers

Inappropriate knowledge amongst healthcare sources is the most important clinical barrier to successful migraine headache supervision.^[88] Most of the migraine sufferers are wrongly diagnosed; for example, about 42% and 32% migraine headache cases are misdiagnosed as sinus headache and tension-type headaches, respectively.^[89] This difficulty starts in medical institutions where there is restricted schooling on the area under discussion. It is expected to be even further prominent in countries with a smaller amount of resources.^[1] The migraine screeners and awareness of migraine programmes could be helpful to deal with such barriers.^[90]

Most doctors, especially in developing countries, are not fully aware of the recent advancements and researches made in migraine management. As a result, they are unable to treat migraine patients properly. An overcrowded healthcare centre, where there is no synchronized system of consultation, makes it hard for neurologists to devote more

time to migraine sufferers as they also have to treat epilepsy and stroke patients.^[5] The American Migraine Study II indicated that only 41% of migraine headache patients received a prescription medicine for migraine while 6 out of 10 patients were still taking over-the-counter medications or no medication at all.^[90] This problem is not confined to the US only. A Latin American study showed that most of the migraine patients were relying on salicylates and paracetamol. Medications used for migraine varied broadly among countries but were mainly nonprescription. Triptans and prophylactic medications were very rarely prescribed.^[10]

According to WHO, internationally, only four hours are dedicated to headache syndromes in official undergraduate medical education, and 10 hours in consultant training.^[9] Similarly, migraine headache managing guidelines developed by the American Headache Society and the American Academy of Neurology were exercised regularly only 55% of responding countries, but fewer in low-income countries.^[9] A summary of clinical barriers to migraine

Table 2: Barriers to migraine headache care

Type	Examples
Societal	<ul style="list-style-type: none"> i. Myths and misunderstandings regarding headache ii. Patients' own presumptive diagnosis iii. Ignorance about the treatment iv. Low literacy rate v. Self-medication vi. Inadequate trigger-control measures vii. Fewer specialized headache associations
Clinical	<ul style="list-style-type: none"> i. Wrong diagnosis ii. Wrong treatment iii. Wrong referral iv. Lack of effort to educate patients v. Underuse of non-pharmacological treatment options
Financial and political	<ul style="list-style-type: none"> i. Poor compliance ii. Low emphasis on headache

headache care is described in Table 2.

Financial and political barriers

Around half of the world's population has the lower-middle class life style. In such living conditions where it is already hard to fulfill basic requirements, patients are unable to treat their headache.^[5] Several governments, looking to reduce healthcare expenditures, did not recognize the considerable inconvenience of migraine headaches on the population. They failed to acknowledge that the expenditures of handling migraine headaches were minute in contrast to the massive indirect costs, for example by minimizing misplaced working days.^[1] Financial and political barriers to migraine headache care are summarized in Table 2.

CONCLUSION

This review concluded that the migraine headache is a prevalent disorder worldwide. Sex and regional variations are evident. Various societal, clinical, financial and political barriers lead to under-estimation, under-recognition, under-diagnosis and under-treatment of migraine headaches. To overcome the global burden of migraine headaches and to implement the standard guidelines, the attitudes of both patients and physicians should be changed. We propose amendments in the core curriculum of medical graduates and postgraduates and improvement in the association between healthcare professionals and international headache organizations, and the provision of health supervision to migraine sufferers. The key to lucrative healthcare for migraine headache is education, which initially should create recognition that the migraine complaint is a medical dilemma demanding treatment. Education of healthcare suppliers should cover both aspects of excellent management and the prevention of mismanagement. This neglected subject will come under consideration by establishing tertiary clinics for migraine management. If we take into account the barriers to migraine care, its burden could be decreased considerably and the health-related quality of life of migraine sufferers could be improved.

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