

The Prevalence and Awareness of Migraine Among University Students in Harbin, China

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Aims: To determine the prevalence and the awareness of migraine among university students in Harbin, China. **Methods:** A cross-sectional study of students was conducted in Harbin Medical University from April 1 to June 30, 2012. The Chinese version of the Identification of Migraine Screener (ID-Migraine) was used as the screening tool, and the awareness of migraine was evaluated by a structured questionnaire. A subgroup of the students was randomly selected to fill out the questionnaire again to evaluate its test-retest reliability. The internal consistency reliability and structured validity were tested using Cronbach's alpha coefficient and exploratory factor analyses. **Results:** Of the 5,129 registered students, 4,406 students (85.9%) signed a consent form and completed the questionnaire. Three hundred ninety-five students were screened positive for migraine, with a prevalence of 9.0%, and the migraine prevalence increased with age ($z = -2.82, P < .01$). Gender ($\chi^2 = 0.12, P = .73$) and body mass index ($\chi^2 = 0.51, P = .78$) did not significantly influence migraine prevalence, and the prevalence showed no significant difference between medical and nonmedical students ($\chi^2 = 2.10, P = .15$). The awareness of fundamental details (definition, classification, symptoms), treatment, and trigger factors of migraine were 40.4%, 42.4%, and 68.6%, respectively. The test-retest reliability of these parts of the questionnaire was 0.61 (95% confidence interval [CI]: 0.48–0.75), 0.77 (95% CI: 0.66–0.88), and 0.80 (95% CI: 0.69–0.91), respectively. Three components accumulatively explained 52.1% of the total variance of the scale, and the rotated factor loadings (the correlation coefficient between the items and the common factor) in each part were all higher than 0.50 excluding item C11. **Conclusion:** The prevalence of migraine in university students was 9.0%, which is comparable to the prevalence found in Chinese adults from the general population in two previous studies. University students have limited awareness of migraine. *J Oral Facial Pain Headache* 2015;29:384–389. doi: 10.11607/ofph.1521

Keywords: awareness, ID-Migraine, migraine, prevalence, university students

Migraine is a highly prevalent and disabling disease occurring in 10% to 18% of the general population.¹ Using years lived with disability as a summary measure of population health, the Global Burden of Disease survey identified migraine in the top 20 causes of disability worldwide.² Migraine contributes to a large proportion of nonfatal, disease-related burden, second only to dental caries and tension-type headaches.³ Despite this, the majority of migraine headaches are still not properly diagnosed or treated.^{4,5} Epidemiologic studies focusing on the prevalence of migraine may provide a better understanding of migraine distribution and pave the way to more effective treatment strategies.

An estimated 60% of migraine sufferers do not recognize their condition.⁶ The Identification of Migraine screener (ID-Migraine) was developed according to the International Headache Society (IHS) criteria to improve the recognition of migraine.^{7,8} The sensitivity and specificity of the Chinese version of the ID-Migraine have been shown to be 84.0%

(95% confidence interval [CI]: 75.0%–90.0%) and 64.0% (95% CI: 59.0%–68.0%), respectively, in a total of 555 students⁹ according to the ICHD-2 criteria.¹⁰

University students represent a potential high-risk subgroup for migraine because psychological and physical stressors, which may trigger migraine attack, are common among them.¹¹ Moreover, migraine has been reported to be related to impaired academic performance.^{12,13} Accordingly, epidemiologic studies on migraine have been frequently conducted among university students around the world.^{14–17} However, similar studies have not been performed before in China. To address this, the aim of the current study was to determine the prevalence and awareness of migraine among university students in Harbin, China. The Chinese version of the ID-Migraine and a structured questionnaire were used for this purpose.

Materials and Methods

Subjects

A cross-sectional study was conducted among undergraduates at Harbin Medical University of China between April 1 and June 30, 2012. A total of 5,129 students were asked to participate in this study. These students were registered in 12 faculties, which include four nonmedical faculties (School of Health Management, School of Humanities Arts and Social Sciences, School of Bioinformatics and Technology, School of Pharmacy) and eight medical faculties (School of Basic Medicine Sciences, School of Public Health, the First to Fourth Clinical Medical College, School of Dental Medicine, and School of Nursing). The students who would be granted a medical degree after graduation were defined as medical students; otherwise, they were defined as nonmedical students. They were all asked to participate in the study. A full introduction to the study, an explanation regarding the importance of screening migraine, and instructions for completing the questionnaire were provided by a trained investigator (XW) in the classroom before the class (100 to 150 students in a classroom), then the questionnaires were distributed and collected. Of the students asked to participate, 4,406 students gave written informed consent and completed the questionnaires sufficiently (response rate 85.9%). The study was approved by the Ethics Committee of Harbin Medical University [2011005].

Questionnaire

The questionnaire consisted of four parts: (1) informed consent, (2) eight questions regarding sociodemographic indicators, (3) the Chinese version

of the ID-Migraine screener, and (4) participants' awareness of migraine.

The questions in part 4 were designed according to the medical students' teaching textbook, the 7th edition of *Neurology*.¹⁸ Its chapter on migraine introduced the definition, etiology and pathogenesis, classification, symptoms, diagnosis criteria, therapeutic and preventive drugs, and trigger factors of migraine. The test-retest reliability of this part of the questionnaire was assessed by Professor YuLan Zhu of the Neurology Department, who revised the questionnaire and randomly selected 130 students (42 males, 88 females; mean age 20.81 ± 0.94 years; response rate = 100%) to fill out the questionnaire twice. The internal consistency reliability and structured validity were tested using 4,406 participants' questionnaires.

Students were considered to be aware of the fundamentals, treatment options, and trigger factors of migraine if they answered at least 50% of the corresponding questions correctly. Students took an average of 10 minutes to finish the entire questionnaire. The full questionnaire is presented at: <http://pan.baidu.com/s/1dDEUG05>.

Statistical Analyses

Normally distributed continuous variables were summarized as mean values ± SD and compared by a *t* test. Categorical variables were presented as counts and percentages, and the differences between groups were statistically evaluated using Pearson's chi-square. The test-retest reliability was evaluated using Cohen's kappa value, and the internal consistency reliability was assessed using Cronbach's alpha coefficient. Values higher than 0.7 were considered acceptable.¹⁹ The construct validity of the questionnaire was determined by EFA.

P values < .05 were considered significant. EFA and Cronbach's alpha coefficient were calculated using Statistical Package for the Social Sciences (SPSS) version 20.0 software package for Windows (SPSS Inc). Other statistical analyses were conducted using SAS statistical software, version 9.1 (SAS Institute Inc).

Results

Demographics of Study Subjects

A total of 4,406 students (1,428 [32.4%] male; 2,978 [67.6%] female; mean age 21.48 ± 1.63 years) participated in the study; 3,096 (70.3%) were medical students and 1,310 (29.7%) were nonmedical students. There was no significant difference in the response rate between male (88.8%) and female (84.6%) students ($\chi^2 = 8.67$, *P* = .47).

Table 1 The Reliability and Validity of the Questionnaire Concerning the Awareness Rate of Migraine

Items	Test-retest reliability (95% CI)		Internal consistency reliability	Rotation sums of squared loadings [†]			% of variance	Cumulative % of variance
	For each item	For each part		Factor 1	Factor 2	Factor 3		
Heard of migraine before								
C1	0.60 (0.39–0.81)	0.60 (0.39–0.81)	1	–0.09	–0.11	–0.76	23.0	23.0
Fundamentals of migraine*								
C2	0.77 (0.64–0.89)			0.55	0.12	0.41		
C3	0.88 (0.81–0.95)			0.62	0.08	0.11		
C4	0.85 (0.77–0.93)			0.56	0.30	0.15		
C5	0.83 (0.74–0.92)			0.58	0.22	0.09		
C6	0.83 (0.75–0.91)	0.61 (0.48–0.75)	0.78 (0.71–0.83)	0.65	0.11	0.10		
C7	0.78 (0.69–0.87)			0.68	0.18	0.16		
C8	0.77 (0.68–0.86)			0.57	0.29	0.27		
C9	0.82 (0.73–0.90)			0.59	0.30	0.18		
C10	0.77 (0.68–0.86)			0.51	0.44	0.10		
Treatment of migraine								
C11	0.76 (0.66–0.85)			0.49	0.47	–0.18		
C12	0.75 (0.65–0.84)			0.55	0.45	–0.10		
C13	0.79 (0.70–0.88)	0.77 (0.66–0.88)	0.68 (0.58–0.76)	0.56	0.37	0.15	20.9	43.9
C14	0.70 (0.60–0.81)			0.53	0.48	0.02		
Trigger factors of migraine								
C15	0.73 (0.63–0.82)			0.38	0.61	0.05		
C16	0.58 (0.44–0.72)			0.18	0.73	0.41		
C17	0.66 (0.50–0.83)	0.80 (0.69–0.91)	0.81 (0.75–0.86)	0.15	0.71	0.46	8.2	52.1
C18	0.75 (0.65–0.85)			0.21	0.77	0.09		
C19	0.76 (0.66–0.86)			0.21	0.75	0.11		

*Questions concerning the definition, classification, and symptoms of migraine.

[†]The correlation coefficient between the items and the common factor.

CI = confidence interval.

Prevalence of Migraine

A total of 395 students (9.0%) screened positive for migraine (95% CI: 8.2%–9.8%; male/female = 1/1.03). There was a significant difference in the age distribution of the subjects with migraine ($\chi^2 = 8.35$, $P = .02$), and the prevalence of migraine increased with age ($z = -2.82$, $P < .01$). Gender ($\chi^2 = 0.12$, $P = .73$) and body mass index ([BMI] = weight (kg)/[height (m) × height (m)]) did not significantly influence migraine prevalence ($\chi^2 = 0.51$, $P = .78$). In addition, the prevalence of migraine was not significantly different between medical and nonmedical students ($\chi^2 = 2.10$, $P = .15$) (Table 2).

Eighty percent of the 395 migraine sufferers reported to have nausea, 62.5% were bothered by light during the headache, and 87.1% claimed that the headache limited their ability to function for at least 1 day. These symptoms were not influenced by gender (feeling nausea, $P = .59$; bothered by light, $P = .97$; limited ability to function, $P = .36$)

Reliability and Validity of the Questionnaire

The test-retest reliability for those questions related to the fundamental details (definition, classification, symptoms, etc), treatment, and trigger factors of migraine were 0.61 (95% CI: 0.48–0.75), 0.77 (95% CI: 0.66–0.88), and 0.80 (95% CI: 0.69–0.91), respectively. Exploratory factor analyses (EFA) found

that three components (the question, “have you heard of migraine before?”; fundamental details and treatment of migraine; trigger factors of migraine) had a cumulative percentage variance of 52.1% ($\geq 50.0\%$ is considered acceptable) and the rotated factor loadings (the correlation coefficient between the items and the common factor) classified in each component were all above 0.50 excluding C11 (≥ 0.5 is considered acceptable)²⁰ (Table 1).

Awareness Rate of Migraine

Of the participants of the study, 87.6% claimed that they had heard of migraine before. This rate was not significantly different between medical and nonmedical students ($\chi^2 = 0.13$, $P = .72$) and the students who experienced migraine or not ($\chi^2 = 0.01$, $P = .94$).

All nine questions about the fundamental details of migraine were answered correctly by 4.3% of the students, while all nine questions were answered incorrectly by 8.5% of the students. At least five questions were correctly answered by 40.4% of the students.

Concerning knowledge about the treatment of migraine, 42.4% of the subjects correctly answered two or more of the four questions, but only 1.5% of the students answered all of the questions correctly, and 29.1% gave no correct answers in this part of the questionnaire.

The participants were also asked to identify certain trigger factors for migraine (including female menstruation, mood, lack of sleep, irregular diet, and cold weather). Three or more of these five trigger factors were correctly identified by 68.6%, and 29.2% correctly identified all five trigger factors.

Only 8.83% of the students (131 males, 258 females; mean age 21.42 ± 1.61 years) indicated that they had heard of migraine before and gave correct answers to the questions about fundamental details, treatment, and trigger factors. Experience of migraine had no effect on awareness of migraine and there was also no significant difference between medical and nonmedical students (Table 3).

Discussion

This is the first study to address the prevalence and awareness of migraine amongst Chinese university students. The response rate (85.9%) to the current study was acceptable and comparable to similar studies of other populations.^{14,21,22} A major finding was that although the majority of students had heard of migraine before, their knowledge of the fundamental details, treatments, and trigger factors of migraine was limited.

There is limited published data regarding the prevalence of migraine in mainland China. A much higher prevalence of migraine has been found in the present study than in previous studies of the Chinese population.^{23,24} These studies were conducted between 1983 and 1985 before IHS criteria were proposed and therefore cannot be readily compared with the present study. In 2012, a study of the general Chinese population reported a migraine prevalence of 9.3%,²⁵ which is comparable to the present findings in Chinese students.

Table 2 The Prevalence of Migraine in Different Subgroups

	Prevalence of migraine (%)	Suffers with migraine n (%)*	Suffers without migraine n (%)*	P value
Age interval (y)				.02
< 21 (n = 1,374)	7.6	105 (7.6)	1,269 (92.4)	
21–22 (n = 1,794)	8.7	156 (8.7)	1,638 (91.3)	
≥ 23 (n = 1,238)	10.8	134 (10.8)	1,104 (89.2)	
Sex				.73
Male (n = 1,428)	8.8	125 (8.8)	1,303 (91.2)	
Female (n = 2,978)	9.1	270 (9.1)	2,708 (90.9)	
BMI				.78
< 18.5 (n = 921)	9.6	88 (9.6)	833 (90.4)	
18.5–23.9 (n = 2,958)	8.8	260 (8.8)	2,698 (91.2)	
≥ 23.9 (n = 527)	8.9	47 (8.9)	480 (91.1)	
Medical student†				.15
Yes (n = 3,096)	8.6	265 (8.6)	2,831 (91.4)	
No (n = 1,310)	9.9	130 (9.1)	1,180 (90.9)	
Total (n = 4,406)	9.0	395 (9.0)	4,011 (91.0)	

*Percentage of students in this group.

†Students who would be granted a medical degree after graduation.

BMI = body mass index, which was calculated by the formula of weight (kg)/[height (m) × height (m)].

Table 3 Awareness Rate of Migraine According to Major (Medical/Nonmedical Student) and Migraine Status

	Heard of migraine n (%)*	Fundamentals knowledge n (%)*	Treatment knowledge n (%)*	Trigger factors n (%)*
Medical student†				
Yes (n = 3,096)	2,705 (87.4)	1,244 (40.2)	1,302 (42.1)	2,101 (67.9)
No (n = 1,310)	1,149 (87.7)	537 (41.0)	567 (43.3)	921 (70.3)
P value	.72	.62	.45	.11
Experience of migraine				
Yes (n = 395)	346 (87.6)	164 (41.5)	182 (46.1)	274 (69.4)
No (n = 4,011)	3,508 (87.5)	1,617 (40.3)	1,687 (42.1)	2,748 (68.5)
P value	.94	.64	.12	.73
Total (n = 4,406)	3,854 (87.6)	1,781 (40.4)	1,869 (42.4)	3,022 (68.6)

*Percentage of students who correctly answered the questions in this part.

†Students who would be granted a medical degree after graduation.

When compared to other student populations, migraine prevalence among Chinese students is higher than that in Nigeria¹⁴ (6.4%), comparable to that in India¹⁵ (8.6%), and lower than that in Brazil¹⁶ (22.7%) and Spain¹⁷ (16.1%); these values are generally consistent with the trend in the global population.²⁶ The race of participants may play a vital role in genetic vulnerability to migraine,²⁷ but it is impossible to draw any conclusions based on these studies,^{6,14,15,17} as they did not provide detailed information regarding the racial background of participants.

Measurements of the prevalence of migraine also can be influenced by the screening tool used.²⁸ ID-Migraine is a well-established screening tool for recognizing migraine,⁹ and the Chinese version has proven to be a valid and reliable screening tool.⁹ The sensitivity of the Chinese version of ID-Migraine⁹ is comparable to previous findings⁸ (84.0% vs 81.0%; $P = .56$), but the specificity of the Chinese version⁹ is significantly lower⁸ (64.0% vs 75.0%; $P = .04$). The Chinese version of ID-Migraine recognizes the incidence of headaches within the past 3 months, which may be higher during times of stress, such as examinations. To avoid distortion of the results, the current study was carried out during a period of no examinations.

The findings of the current study suggest that migraine prevalence is not affected by gender. An approximately similar male-female prevalence has been found in studies conducted in Chinese adults^{25,29} and in university students in Iraq³⁰ and Pakistan.³¹ Studies using ID-Migraine as the screening tool in university students in England and Turkey have reported higher male-to-female ratios.^{32–34} This difference likely reflects the lower specificity of the Chinese version of ID-Migraine, which may give a higher false-positive rate, distorting the male-to-female migraine prevalence ratio. In addition, the results of the present study suggested that the BMI of the students had no significant association with migraine, which is consistent with previous studies carried out in Brazil³⁵ and United States,³⁶ but different from the results in the Chinese general population.³⁷

The results of the present study also showed that the prevalence of migraine increases significantly with age, which may be due to heightened pressure from studying and examinations³⁸ since age increases with the years of study.

Study Limitations

This study had some limitations. First, the survey was conducted in students in the northeast of China, where cold weather³⁹ and various food supplements⁴⁰ may trigger migraine, resulting in an overestimation of the prevalence of migraine relative to other regions. Therefore, these findings cannot reliably be extrapolated to other university students in other regions. Second, the ID-Migraine screener only distinguishes subjects with migraine from healthy participants and does not classify subtypes of migraine, such as migraine with or without aura. Therefore, conclusions cannot be drawn about the prevalence of various subtypes of migraine. Third, the introductory lecture explaining the importance of screening for migraine to the participants may have led to a degree of selection bias.

Conclusions

The prevalence of migraine among university students in Harbin, China was 9.0%, and was unaffected by gender and BMI. In addition, there was no significant difference in the prevalence of migraine between medical and nonmedical students. The current study also showed that the university students had limited awareness of migraine and would benefit from additional tuition to help them recognize migraine and understand the treatment options available. Larger student cohorts from different universities should be studied in the future, taking into account different confounding variables, such as seasonal climate.

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