

Prevalence of Headaches Among Undergraduates in Sri Lanka: Cross-Sectional Analysis

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Abstract

Background: Headache is one of the common health problems in the world which can be frequently seen among undergraduates. The current research was mainly focused to explore the prevalence of headaches among undergraduates in Sri Lanka.

Method: This cross-sectional survey-based study was conducted among undergraduates of five Sri Lankan universities including various disciplines from science to non-science. A purposive sample of undergraduates was recruited to complete a self-administered questionnaire after obtaining their consent. Data were analyzed using Statistical Package for the Social Sciences (SPSS v25 IBM, New York, USA) and the significant differences among variables were assessed by using Chi-square test. Ethical approval was obtained from the Ethical Review committee of Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.

Results: The majority of respondents were males (51%, n=146) and who were following science courses (55%, n=158). Undergraduates (76%, n=218) had experienced headache. Common trigger factors were stress related to work (72%, n=171), mental fatigue (54%, n=129), and sleeplessness (33%, n=79). Undergraduates 43% (n=123) who perceived the experience of headache sought the treatments. Usage of non-prescribed medication was significantly high (73, n=90) among them. There was a statistically significant difference between the occurrence of headache for non-science students with the participation for lectures ($p=0.021$); health status with the academic year ($p=0.00$); perceived current headache problem with gender ($p=0.03$) and the avoidance in participating lectures with academic years ($p=0.006$).

Conclusions: It can be concluded that most undergraduates in Sri Lankan universities have been affected by headaches. Stress-related to work, Irregular sleep behavior, mental fatigue and prolonged computer work were the most common trigger factors for headaches among undergraduates in Sri Lanka.

Background

Headache is one of the common disorders of the nervous system affecting all age groups worldwide [1]. The International Classification of Headache Disorders (ICHD-III β) classifies headaches into two major forms as primary and secondary headaches. Migraine, tension-type and cluster headaches are considered primary headaches. Headache can also be caused by or occur secondarily to a long list of other conditions, the most common of which is medication-overuse headache [2, 3]. The estimated mean prevalence of headache over periods between one month and lifetime in children and adolescents is 54.4%-58.4% while the mean prevalence of migraine is 9.1% [4–6]. According to the findings, the total prevalence of active headache disorders in the global adult population are 46% for headache in general, 42% for tension-type headache, 11% for migraine and 3% for chronic daily headache. Even though the prevalence is high, headache disorders remain neglected and underestimated throughout the world [7].

The potential of occurring headache disorder is greater in individuals with familial history, sleeping problems, high body mass index, smoking, stressful life conditions, substance abuse, oversleeping, weather conditions, menstruation and premenstrual period [8, 9]. Migraine attacks can be triggered by fatigue, hunger, bright lights. Stress is an important trigger of both migraine and tension headaches [10]. Due to the high prevalence, chronic occurrence and substantial disability burden upon the subjects, primary health disorders are reflected as major global health problems. According to the Global Burden of Disease Survey 2010, headache disorders are among the major ten causes of disability worldwide [11]. The global burden of headache is enormous; however, it is widely ignored [12].

Headache disorders are known to have a considerable impact on patients' job performance and quality of life, give rise to an economic burden on society [7, 8]. Moreover, headache conditions are related to the limitation of social activities, depletion of productivity at work, and impairment of quality of life [13–15]. Especially in student populations, headache disorders lead to reduce the number of days of studying and poor academic performance due to under-diagnosed and under-treated headache conditions [16].

Analgesics are often used to treat headache while headache is the commonest reason for analgesic use in the general population [17]. Analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), serotonin (5-HT) agonists, ergotamines and anti-emetics are used as therapeutic agents for migraine attacks. For the migraine prevention, effectiveness of beta-blockers (metoprolol and propranolol), calcium antagonists (flunarizine), anticonvulsants (topiramate and valproic acid) and antidepressants (amitriptyline) has been shown in randomized studies. Dietary and lifestyle changes also can be identified as a recommendation for the treatment of migraine [18, 19]. It is reported that a very high percentage of students practice self-medication, use over the counter drugs without the consultation of physicians [20]. Due to the high prevalence of headache, the majority of the victims have been found to practice self-medication leading to irrational drug usage. It is found that the victims have the possibility of induction of refractory type of headache as well as analgesic overuse headache [21].

According to a population-based study carried in the Polonnaruwa educational zone, at least one severe episode of headache was experienced by 94% whilst recurrent headaches over a minimum period of three months were reported by 40%. Headache is one of the common problems among children and adolescents in Sri Lanka [22, 23]. The prevalence of headache among Sri Lankan undergraduates remains under-recognized. A study of prevalence of migraine among defense and non-defense undergraduates in General Sir John Kotelawala Defense University (KDU) revealed that overall migraine prevalence was 25% among students while male students had a higher prevalence (54.5%) than females (45.5%) [24]. This study was only limited to undergraduates of one Sri Lankan university and the results cannot be generalizable. Therefore, the current study was designed to investigate the prevalence of headache of undergraduates in Sri Lanka using five different universities around the country. The secondary aims of the study were to investigate treatment pattern, the impact of headache for undergraduate life, trigger factors and to explore the use of medications for headache.

Methods

Study Design and Recruitment of Participants

This cross-sectional survey-based study was conducted in five universities in Sri Lanka including undergraduates in various disciplines. A purposive sample of undergraduates (n=300) [25], was recruited for the study whose age ranged between 20 to 30 years after obtaining their written consent to complete a self-administered questionnaire. Students who had any communicable or chronic diseases were excluded from the study.

Ethics

Ethical approval was obtained from the Ethical Review Committee of Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.

Data Collection and Analysis

Quantitative data were collected mainly through a self-administered questionnaire. This questionnaire was developed modifying the questions informed by the literature [2,26,27]. The questionnaire was face-validated and pre-tested before the distribution. The questionnaire contained seven domains including demographic details, symptoms of headache, impact on daily activities, trigger factors, common measures that are used to relieve headache, common practices used to prevent headaches, and treatment (Additional file 1).

The survey was conducted from July 2018 to December 2018 for undergraduates in Sri Lanka. Data were entered into Microsoft Excel Office 2007 and analyzed using the statistical package for social science (SPSS version 25 IBM, New York, USA). The Chi-square test was used to analyze the significant differences among variables. A probability of less than 0.05 was considered as significant.

Relationship between suffering from headache when they were younger, health status, the nature of the beginning of current headache problem, having problems of falling asleep, avoiding participating for the activities (lectures, examinations and sports) and taking medications with variables such as nature of the discipline (non-science and science-based degrees), academic years and gender were evaluated.

Results

Socio-demographic Details

Only 96% of undergraduates (n=287) completed the questionnaire appropriately. Among the respondents, the majority were males (51%) (n=146). Undergraduates who were following science-based degrees (55%) (n=158) were higher compared to non- science degrees (45%) (n=128). Socio-demographic characteristics of the participants are shown in Table 1.

Prevalence of Headache (Frequency of Occurrence, Symptoms and Trigger Factors)

Undergraduates suffered from headaches when they were younger was 38% (n=108). Undergraduates who perceived experience of headache was 76% (n=218). Among the respondents 42% of undergraduates (n=92) perceived the experience of headache months ago, 37% (n=80) perceived the experience of headache several years ago and 21% (n=46) of undergraduates perceived the experience of headache for several days. The frequency of occurrence of headache was as follows, 37% (n=87) of the participants experienced headache once a week while 30% (n=70) of participants experienced once a month. The percentage of students who experienced headache each day was 10% (n=24).

Majority of the undergraduates (49%, n=115) experienced the occurrence of headache “suddenly” while (39%, n=93) minority of undergraduates experienced it gradually. When considering the time of the occurrence of headache, 42% (n=98) of participants experienced headache in the afternoon, 29% (n=68) in the evening respectively. Interestingly, the majority of undergraduates had not experienced headache at the beginning of the day (in the mornings). Further, 58% (n= 137) of undergraduates experienced relief from headache within hours of medication while 36% (n=84) stated that their headache lasts for minutes with medication. However, 65% (n=153) participants stated that their headache lasts for hours without medication. Moreover, when considering intensity of headache with and without medication; with medication, the majority of students 97% (n=227) experienced mild to moderate headache. When considering the intensity of headache without medication, 38% (n=89) of students were in severe condition while 52% (n=122) experienced moderate condition.

Most of the students 34% (n=81) had a feeling of the pain in both sides of the head. Additionally, 29% undergraduates (n=69) had the pain behind eyes, 21% (n=50) either left or right sides, 10% (n=23) left side, 11% (n=25) neck and 16% (n=37) back of the head and 7% (n=17) had a feeling of the pain in both sides of the head. The prevalence of trigger factors associated with headache of the study population is shown in Table 2.

As a symptom, the majority of undergraduates experienced fatigue (56%, n=131). Mood changes” were caused due to headache in 24% (n= 56) of students. Moreover, 18% (n= 52) of the students were presented with neck pain. Partial loss of vision occurred in 15% (n= 36) of students. Appetite changes were experienced by 12% (n=29) of students. “Upset of stomach” was caused due to headache in 6% (n= 14) students.

Impact on daily activities

From the total participants, 68% (n= 195) rated their health in general as “Average”, 9% (n= 25) as “Good”, 18% (n= 51) as “Excellent” and 5% (n= 15) as “Poor”. “Average” health status was shown by the majority of the undergraduates of all four academic years. There was a statistically significant relationship between academic years with the health status of undergraduates ($p= 0.00$, $p<0.05$) participated in the study.

According to sleeping behaviors of the participants, 31% (n=78) of participants showed problems with falling asleep while 26% (n=65) presented problems with staying asleep. When assessing the eating

behaviors of the participants, the majority (64%, n=158) had not skipped their breakfast, but they had not taken their lunch (27%, n=66) regularly.

Participants who avoided the lectures, examinations and sports due to headache were 32% (n=78), 11% (n=26) and 21% (n=52) respectively. Most of the non-science undergraduates avoided participating in the lectures than science undergraduates. There was a statistically significant association between avoiding participation in the lectures due to headache with the discipline of study of undergraduates ($p = 0.021$, $p < 0.05$) Moreover most of the undergraduates in the 2nd year avoided participating in the lectures than other academic years. There was a statistically significant association between the academic years with undergraduates who avoided participating in the lectures ($p = 0.006$, $p < 0.05$). There is no statistically significant association between problems when falling asleep, avoiding participating in the lectures, exams, and sports with the academic years.

Common measures and practices used to relieve/ prevent headache

The majority of respondents (71%, n=170) marked that "Lying down" / "Sleeping" as the most comfortable positions when they are suffering from headache. Head massage was used by 53% (n=128) of undergraduates and being in a dark quiet room was used by 15% (n=37) students, hot packs on the head/neck were used by 4% (n=9) as measures to relieve from headache.

According to the data, 43% of participants (n=123) sought treatments to relieve symptoms of headache. Among them, 33% of students (n=41) took the treatments from a doctor. Over the counter medications were used by 73% of students (n=90). Additionally, Ayurveda treatments were taken by 12% of students (n=15).

Medication use for headache in the study population is shown in Figure 1 (n= 87).

Discussion

Headache is a common health-related phenomenon among the young population in the world [8, 21]. In this descriptive study, we analyzed the impact of several variables on the prevalence of headache and drug usage among Sri Lankan undergraduates. A sample of undergraduates was purposely drawn from five Sri Lankan universities including various disciplines to increase the generalizability of the study.

In our study, the majority of participants (42%, n = 92) perceived the experience of headache months ago and this finding is supported by several studies [7, 28]. It was reported 37% of the undergraduates (n = 87) experienced headache once a week while 30% (n = 70) experienced headache once a month. One of the fascinating facts is that 10% (n = 24) of undergraduates experienced headache each day. Our findings are compatible with a study conducted to investigate the prevalence and impact of headache in undergraduate students in Southern Brazil which has reported 40.9% of the subjects experienced a headache once a week while 39.3% of the subjects experienced a headache once a month [8].

When considering the occurrence of headache, the majority of the students (49%, n = 115) experienced headache suddenly rather than gradually. A higher number of students (42%) (n = 98) experienced headache in the afternoon compared to any other time of the day. It may result from skipping lunch, tiredness and heavy workload during the day. Family behaviors and low income may affect psychological stress and it may lead to headache [29]. The same fact is compatible with our results of socio-economic status of participants (undergraduates from low or very low-income families (62%, n = 178) and stayed away from their families (74%, n = 212)).

Undergraduates in our study (34%) (n = 81) stated “both sides of head” as the location of headache. The pain in one side of the head, either left or right of the head and back of the head were prominent in the majority of the students. Concerning headache classification based on the location of headache, tension-type and migraine headache are common among the undergraduates in Sri Lanka [2]. This may due to some stressful factors which can lead to physical discomfort like headache and ultimately affect the psychological and physical well-being of a person. These findings are supported by a Brazilian study conducted to investigate the prevalence and impact of headache in undergraduates in Southern Brazil [8]. Stress is the most prominent trigger factor for the headaches among undergraduates in Sri Lanka. Mental fatigue, sleeplessness and prolong computer work related to studies are common trigger factors except stress. Our findings are compatible with international and local studies which were conducted in a similar approach [30, 31]. This study reflects that stress management has an immense importance. Undergraduates in this study, used to manage their stress mainly engaging in hobbies 48% (n = 137) and maintaining healthy family relationships 31% (n = 88).

This study has revealed that undergraduates experienced fatigue and mood changes as common symptoms of headache. Additionally, when considering the most comfortable positions, during headache “lying down” or “sleeping” was shown by the students. Compared to other studies, the requirement of bed rest was the best comfortable position for the students to face the disability of having headaches [32]. Concerning the treatments to relieve symptoms of headache among the participants, a considerable number of participants 43% (n = 123) sought treatments for headache. A Nigerian study conducted among medical students has reported that non-prescription drugs were taken by a higher number of Nigerian students [33]. According to a study carried out in Oman, a higher number of students take non-prescribed medication compared to prescribed medication [34]. Usage of non-prescribed medication in this study is in accordance with the findings of both Nigerian and Oman Studies. However, in this study seeking of medical assistance from a doctor/physician was higher compared to those two studies. The usage of traditional remedies was high among Sri Lankan students compared to Oman students. Sri Lanka has its own indigenous medicine system which is a mixture of Sri Lankan traditional medicine and Ayurveda medicine. Although traditional remedies are used significantly in Sri Lanka compared to other countries, it is used less compared to prescribed and non-prescribed medication. It may be due to less patient compliance and uncomfortable outcomes. As a total evaluation of treatments for headache, there is a high tendency to use non-prescription drugs. Furthermore, the majority of the undergraduates do not seek medical assistance and neglect the use of medicines.

According to the findings of this study, analgesics were mostly used. "Paracetamol" was the most used analgesic. It is in accordance with a study conducted regarding headache in Ethiopia [35]. A study on the prevalence of headache among dental students in India reveals that the majority practiced self-medication while paracetamol, aspirin and a combination of paracetamol and ibuprofen were the most commonly used drugs [20]. Paracetamol followed by mefenamic acid were the most commonly used drugs for headaches among medical students [34].

A considerable number of undergraduates used non-prescription medicines. Specific medication use was found to be low showing insufficient management of headache [20]. Paracetamol is the most used analgesic among undergraduates hence it is an over the counter medication. Other NSAIDs like ibuprofen and mefenamic acid were also used to relieve pain. The majority of non-science students are not well read in anti-inflammatory drugs due to their less pharmacological knowledge. Therefore, overuse of anti-inflammatory drugs may lead to secondary headaches as well.

Primary headaches have an influence on individuals of all ages, causing impairment and less quality of life. The disability precipitated by headache has a negative impact on academic productivity in undergraduate student populations [21, 36, 37]. According to this study, a considerable number of undergraduates avoided participation in examinations, lectures and sports due to headaches. According to the findings of this study, most of the non-science undergraduates avoided participating in the lectures than science undergraduates. Avoidance of participating in the lectures may affect the student performances and ultimately become a heavy burden on the examinations. Therefore, headaches may have a major impact on students' lives and ultimately lead to educational failure [8, 31]. In this study we did not evaluate the students' academic performances and the impact on academic performance due to headache which can be stated as a limitation of our study. There was a statistically significant association between academic years and suffering from headache. It may be due to different types of workload associated with each academic year. According to this study, 2nd year undergraduates avoided participating in the lectures compared to undergraduates enrolled in other years.

The emergence of the current headache problem since several years ago has shown mostly by females rather than males. Several studies have demonstrated that the prevalence of headache was higher in females as compared to males and our results are in accordance with these studies [16, 20, 31, 33]. There was a statistically significant association between genders with perceived experience of headache with respect to time in the current study. Therefore "gender" can also be considered as another main factor involved in headache occurrence. The reasons may be hormonal disturbances and menstruation-related problems among female students. Problems when falling asleep, avoidance of participating in the lectures, exams, and sports have increased in females compared to males according to the current study. Additionally, taking medications, getting over the counter drugs, getting medications from a doctor and getting treatments of Ayurveda is observed more in females than males.

This study has several limitations. Our survey was conducted for undergraduates from five pre-determined state universities, where we cannot observe high variation in socio-economic status. The

impact on academic performances due to headache was not evaluated as it is out of our study scope. Furthermore, we couldn't directly identify misuse or addiction behaviors of drug usage for headaches. We recommend future studies to assess the impact of headache on academic performances, and behaviors of drug usage of headache.

Conclusions

In conclusion, the prevalence of headache was high among undergraduate students in Sri Lankan Universities. The socio-demographic factors such as gender, academic year, degree type were statistically significant with headache prevalence. According to the drugs used for headaches, paracetamol was the most popular drug. The headache problem had badly affected the student's day to day activities. The most common trigger factors were stress, fatigue and irregular sleeping patterns among the undergraduates.

Proper knowledge should be disseminated among undergraduates for managing headache problems. Therefore, educational programs and other ways of effective medication usage especially, non-pharmacological treatments, prevention of trigger factors for headache, proper behavioral patterns should be designed from the university level. Awareness of the general public on the headache prevalence and drug usage patterns should be improved. Unsafe and inappropriate practices associated with drug use for a headache should be taken into account when carrying out future studies.

Abbreviations

SPSS - Statistical Package for the Social Sciences

NSAIDs - non-steroidal anti-inflammatory drugs

KDU - General Sir John Kotelawala Defense University

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Ethical Review committee of Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.

Committee's reference number – AHS/ERC/2018/044

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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No.

Authors' contributions

CP conducted the study, analyzed data and interpreted the data. JSM analyzed the data, interpreted data and was a major contributor in writing the manuscript. IT edited the manuscript and guided the study. The study was designed by TS. TS guided the study and edited the manuscript. All authors read and approved the final manuscript.

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Authors' information (optional)

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Tables

Table 1
Socio-demographic characteristics of the participants (n = 287)

Socio-demographic characteristics	Number of participants	Percentage (%)
Gender	146	51
Male	141	49
Female		
Academic background	158	55
Science	129	45
Non-science	106	37
Academic year	86	30
1st year	52	18
2nd year	43	15
3rd year		
4th year		
Socio-economic status	69	24
Very low income families	109	38
Low income families	83	29
Middle income families	26	09
High income families	149	52
Accommodation	75	26
Hostels	54	19
Home	09	03
Rented places		
Other		

Further, a statistically significant relationship between gender with perceived experience of headache with respect to time ($p = 0.03$, $p < 0.05$) was observed.

Table 2
Triggers associated with headache (n = 237)

Trigger factors	Number of participants	Percentage %
Mental fatigue	129	54
After stress	90	38
During stress	81	34
Little sleep	79	33
Studying	73	31
Prolong computer work	64	27
Whether changes	47	20
Bright light	57	20
Loud sounds	46	19
Certain foods	26	11
Certain odors	23	10
Too much sleep	19	08
Coughing	17	07
Menstruation	15	06
Alcohol	08	03
Coffee	07	03
Tea	06	03
Exercise	05	02

Figures

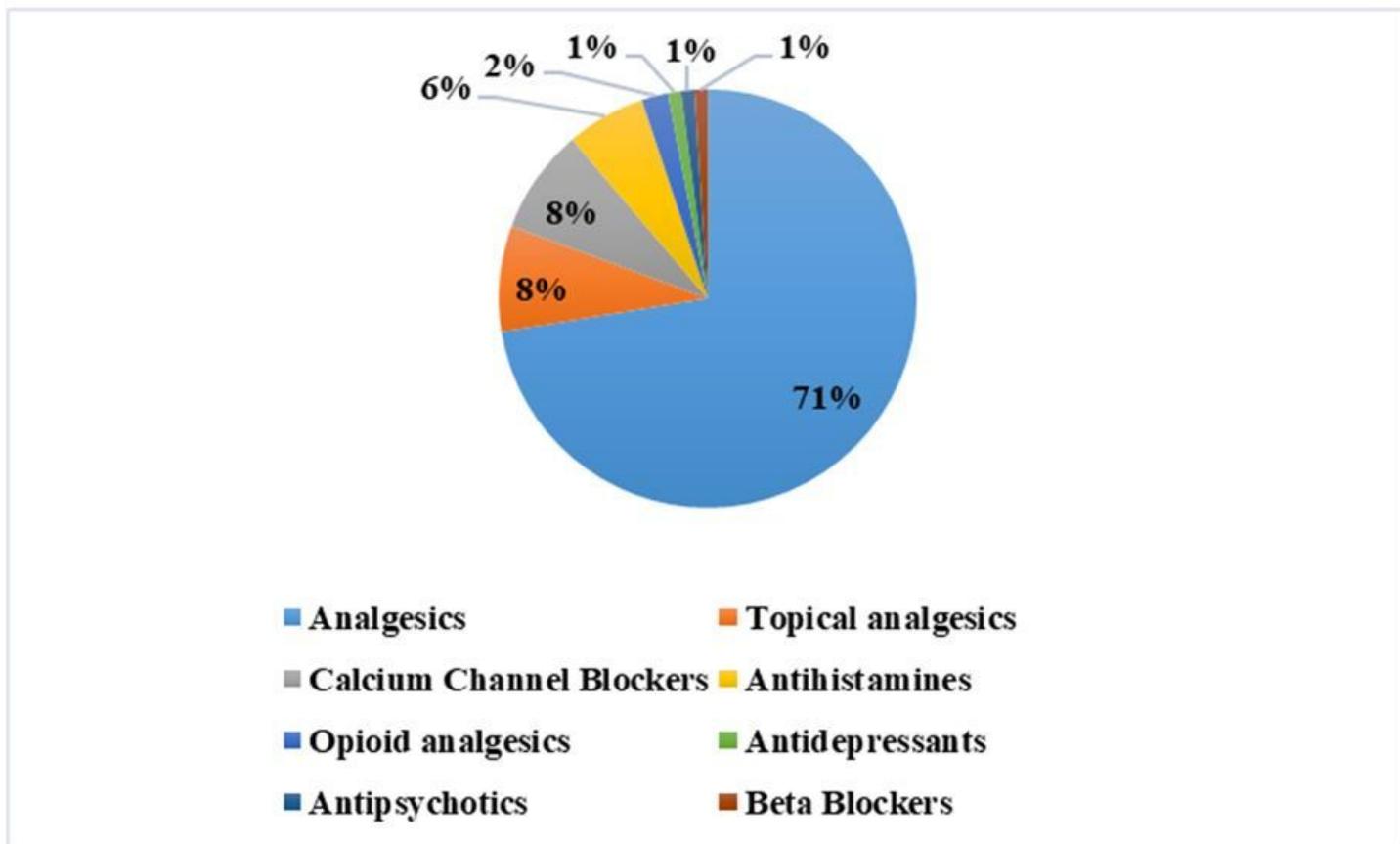


Figure 1

Percentages of drugs according to the drugs group

Supplementary Files

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