

Research article

Prevalence of tension-type headache and its correlation with sleep quality among physiotherapy and nursing students from higher education institutions in Klang valley, Malaysia, during the COVID-19 pandemic

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ABSTRACT

Introduction and Aim: Previously tension-type headache (TTH) was found to be highly prevalent among the general population worldwide, but the current data available were limited. Due to the COVID-19 pandemic, many life changes occurred to adapt to the situation, students started e-learning from home and their sleep quality (SQ) might be influenced. Physiotherapy and nursing students were studied as they are rarely being studied by researchers, information about them was very limited. This study aimed to determine the prevalence of TTH, SQ and the type of correlation between the two during the COVID-19 pandemic.

Methods: A cross-sectional study was conducted by sharing the online questionnaires composed of 2 main components: (i) Questionnaire formulated from diagnosing criteria for TTH of ICHD-3 (ii) Pittsburgh Sleep Quality Index (PSQI), to PS and NS students from higher education institutions in Klang Valley, Malaysia.

Results: A total of 259 respondents were recruited in the study. The prevalence of TTH was 76.8% and SQ had a mean score of 5.12, which indicated poor SQ among PS and NS students, during the COVID-19 pandemic. Correlation between TTH and SQ was proved to be significant in this study ($p=0.032$, $r_s=0.133$).

Conclusion: High prevalence of TTH and poor SQ among PS and NS students during the COVID-19 pandemic was determined. There is a weak positive correlation between TTH and SQ during COVID-19 pandemic.

Keywords: Tension-type headache (TTH); sleep quality; COVID-19; physiotherapy students; nursing students.

INTRODUCTION

Tension-Type Headache (TTH) is commonly described as a band wrapped around the forehead tightly and according to the diagnostic criteria of ICHD-III, the characteristics of TTH includes experiencing at least headache once a year, experiencing at least one or more episodes of headache within same headache day, lasting from 30 minutes to 7 days, bilateral location on forehead, pressing or tightening feeling (non-pulsating quality), mild to moderate pain, does not aggravate by physical motions, absence of nausea, and not more than one of photophobia or phonophobia (1). Many clinical and neurophysiological studies have been conducted on TTH, however the exact cause of TTH is still elusive (2). In a previous study on pathophysiology of TTH, TTH was believed to be a response due to the excessive contraction and inflammation of head and neck muscles, and genetics factors may play a partial role in TTH as well (3). However, in recent studies, TTH is strongly suggested to be neurological, due to the alteration of structures in the nervous system (4). According to a systematic review, occurrence of TTH may be due to central sensitization of neurons at spinal dorsal horn, trigeminal nucleus, or supraspinal neurons, and decreased descending inhibition from supraspinal structures induced by continuous nociceptive input from pericranial muscles and myofascial tissues (4).

TTH is a headache disorder that is highly prevalent in the general population. Among the general population, the student population is more prevalent to have TTH (5). A study conducted in Nigeria has shown that among 1500 undergraduate students who participated in the study, 12.5% (187) of the participants have TTH (6). In the healthcare student population, medical students are often being selected to be the target population of study due to their high workload and stress that are commonly known by the public (7). Research that was carried out in Ukraine have found that headaches bother 82.8% (121) of the medical students recruited and 58.7% (71) of them experience TTH (8). Another study in Brazil recruited 241 medical students, and the prevalence of TTH is as high as 64.7% (156) among the medical students (9). Therefore, physiotherapy and nursing students who similarly have a high workload need to be studied and hence are the target population of this study.

As of now, there are limited studies that have analyzed the prevalence of TTH among students in Malaysia. Previously a community-based prevalence study on headache was conducted in Malaysia by Alders *et al.*, countless years have passed since 1996, hence, this study is very much needed. As TTH is being more and more prevalent among the general population across the globe, the need to analyze the prevalence of TTH in Malaysia during this COVID-19 situation is more, to raise awareness and provide additional treatment

strategies to both the physician and physiotherapist. Research analyzing the prevalence of TTH among the general and student population especially in Malaysia is limited and scarce. There are less than 10 studies that focus on measuring the prevalence of TTH among students (10,11). Hence the objective of the study is to determine the prevalence of TTH among PS and NS students from higher education institutions in Klang Valley, Malaysia. To determine sleep quality of PS and NS students from higher education institutions in Klang Valley, Malaysia, during the COVID-19 pandemic. To analyze the correlation between TTH and sleep quality of PS and NS students from higher education institutions in Klang Valley, Malaysia, during COVID-19 pandemic.

METHODOLOGY

This is a cross-sectional study designed to measure the prevalence of tension-type headache among physiotherapy and nursing students from higher education institutions from Klang Valley, Malaysia, during the COVID-19 pandemic. The study was approved by UTAR Scientific and Ethical Review Committee U/SERC/232/2021. Data collection started on 12th of November and ended on 29th of November. Sample size approximation was done by referring to the data provided by Department of Statistics Malaysia (2021), there are a total of 35 211 students from private higher education institutions studying health and welfare. With that as primary data, the Krejci and Morgan table is used to determine the required sample size. From the table, the required sample size was calculated to be 380 (12). By estimating a dropout rate of 15%, the ideal sample size estimated was 437. Physiotherapy and nursing students regardless of age, gender, year of study, and qualifications were study participants. All full-time physiotherapy and nursing students from higher education institutions in Klang Valley, Malaysia were included. Exclusion criteria were those who have completed their course., temporarily withdrawn from their course, part-time students, physiotherapy, and nursing students who are not from higher education institutions in Klang Valley, Malaysia.

Instrument

The questionnaire is formulated based on the diagnostic criteria of ICHD-3, 2.4.1-probable infrequent tension-type headache (IHS, 2013). Modifications are made mostly on symptomatic items such as photophobia, phonophobia, and nauseousness. This questionnaire was sent to 6 validators, a consultant physician and neurologist and five academicians. The validators were required to rate 9 indicators on a 5-point Likert scale. Mean score was generated from the medians of the indicators to find out the general score of this questionnaire. A mean score of 3.5 is obtained, and it can be concluded that this questionnaire is valid. Pittsburgh Sleep Quality Index (PSQI) has 19 self-rated questions and five

questions rated by bed partner or roommate (if available). There are seven components in total, and each indicates subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, usage of sleeping medication, and daytime dysfunction. The sum of the seven components is known as the global score.

Procedure

The questionnaire was modified according to the validators' suggestions and comments. The instruments were converted into google form. The google form link was shared through social media such as Facebook, Instagram, WhatsApp, and others. A total of 10 higher education institutions located in Klang Valley, Malaysia, were reached. Student representatives, physiotherapy and nursing societies from target universities were reached out to seek for their cooperation and assistance to spread out the google form link. The google form consists of four major components. The first page of the google form was a short brief and introduction about the study, to provide respondents a quick idea of what the study is about. Respondents were required to fill up the consent form upon participation and acknowledge the personal data protection notice statement. Those who did not consent to the study did not progress to the next section. The second part of the google form was to collect socio demographic data of the respondent, such as, age, gender, year of study, associated higher education institution, year of study, and nationality. The third part of the google form was the modified ICHD-3 questionnaire for TTH, and the last part of the google form was PSQI. Data collected from the google form was organized using Microsoft Excel sheet. Questionnaires on TTH and SQ were assessed and analyzed with the scoring criteria provided. Some of the data were entered into the Statistical Package for Social Science (SPSS) application to generate visual charts and calculate statistics.

RESULTS

Demographic data

A total of 264 responses were received, five of them were excluded as they did not fulfill inclusion criteria, which left with a total of 259 eligible responses. Majority of 48.6% (126) respondents were from UTAR and the second highest response rate of 15.4% (40) was MAHSA. Respondents from SU and UKM were 9.7% (25) and 9.3% (24) respectively. 5.8% (15) of the respondents were from UoC and 4.2% (11) of the respondents were from UM. 3.5% (9) of the responses were received from IMC, 1.9% (5) were received from UiTM, and 1.5% (4) of the responses were from ILKKM Sg Buloh. A majority of 29.3% (76) of the respondents were 21-year-old. The mean score of age was 21.25-year-old with a standard deviation of 1.8. In terms of gender, female was 73% (189). The remaining 27% (70) of the respondents

were male. 66.8% (173) was physiotherapy students and 33.2% (86) were nursing students. Majority of the respondents, 83.8% (217) of them were degree students, whereas only 16.2% (42) of the respondents were diploma students. In terms of the distribution of the respondents' year 40.5% (105) respondents were in their third year and 24.7% (64) in year two. 18.1% (47) were final year students and 16.6% (43) were first year students.

Normality distribution

Shapiro-Wilk test of normality was performed using the demographic data, TTH mean score, and PSQI

mean score of each respondent. The result showed that all the data had a p-value of less than 0.001, $p\text{-value} < 0.05$ indicated that the data were deviated from the normal distribution. Fig. 1 is the representation of the distribution of the TTH mean score, indicating that the data were not normally distributed. Fig. 2 is the representation of the distribution of the SQ mean score. Although the shape of histogram presents a bell shape, it was deviated away from the normal distribution bell curve, since the data were not normally distributed.

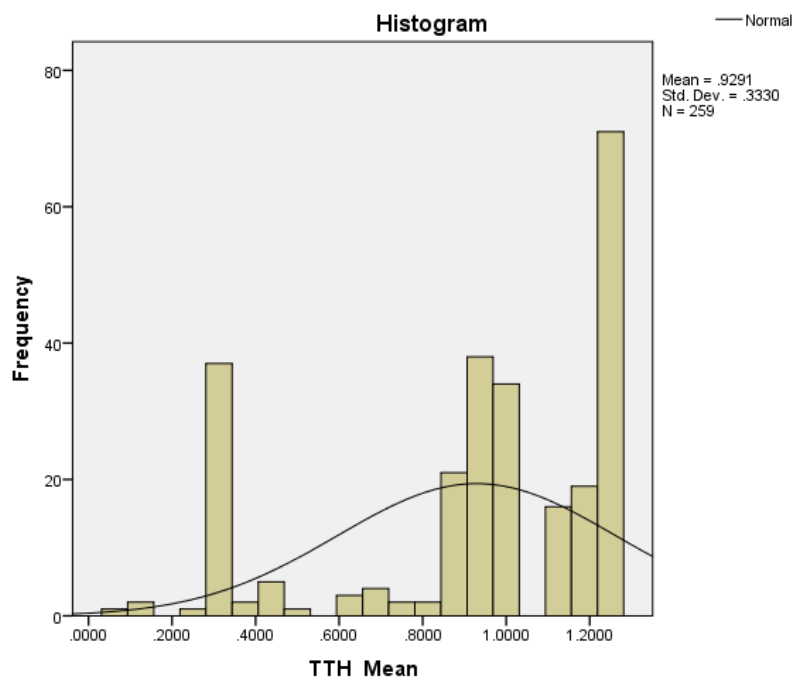


Fig. 1: Histogram of TTH mean score

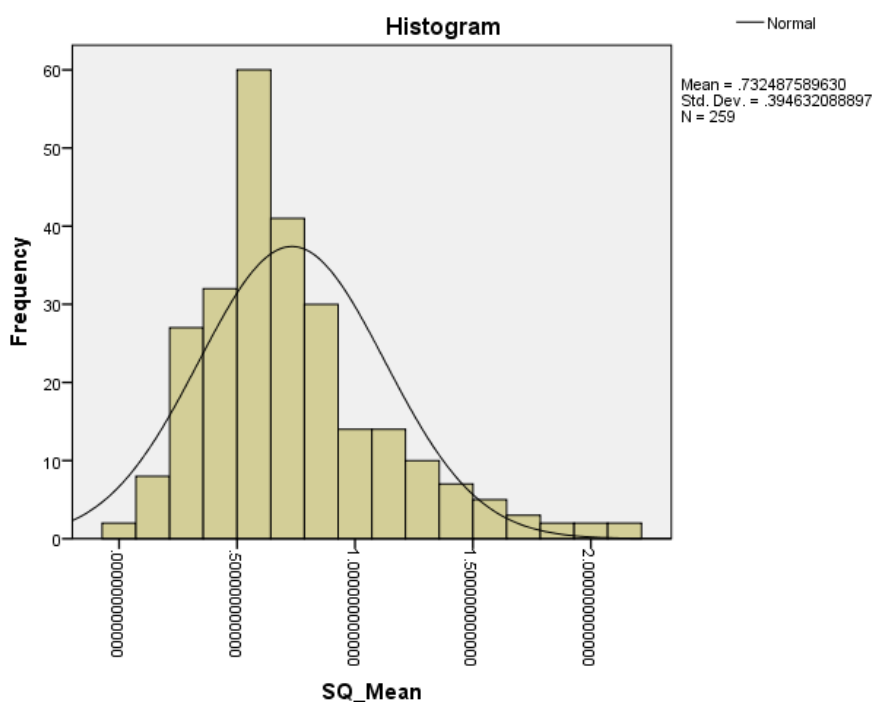


Fig. 2: Histogram of SQ mean score

Prevalence of tension-type-headache

After analyzing the responses of ICHD-3 questionnaires according to the scoring criteria, the general prevalence of TTH among PS and NS students has been found to be 76.8% (199). And the prevalence of TTH among PS and NS students was 76.3% and 77.9% respectively. Prevalence of TTH among males and females were 71.4% and 78.8% respectively. TTH had a prevalence of 83.3% and 75.6% among diploma and degree students respectively. Prevalence of TTH was 6.7% higher among diploma students compared to degree students. Prevalence of TTH was the lowest among first year students, which was 58.1 %. Prevalence of TTH was found to be 71.9% among year two students and TTH among third year students and final year students were higher, 83.8% and 85.1% respectively. The global PSQI score of each respondent was used as a reference to categorize all the respondents into two main categories, those with good SQ and those with poor SQ. Among those who had good SQ, the prevalence of TTH was 70.5%, The prevalence of TTH was 12.6% higher in the poor SQ group, which was 83.1%

Prevalence of poor sleep quality

The general prevalence of poor SQ among the respondents was 50.2% (130), which was half of the

respondents recruited in this study. The poor SQ has a higher prevalence among NS students, which was 65.1% (56). The prevalence of poor SQ among PS students was 42.8% (74). Prevalence of poor SQ among males and females was not much of a difference, 48.6% (34) and 50.8% (96) respectively. Prevalence of poor SQ was 33.9% higher among diploma students compared to degree students. Prevalence of poor SQ among first year, third year, and final year students were relatively similar, which were 48.8 % (21), 47.6% (50), and 46.8% (22) respectively. Among those who had TTH, the prevalence of poor SQ was 54.3% (108). The prevalence of poor SQ among those without TTH was 36.7% (22).

Correlation between TTH and SQ

Each respondent's TTH mean score and PSQI mean score were entered into and analyzed using SPSS software. Since the data were not normally distributed, Spearman's correlation test was performed using SPSS software with the mean score of TTH and PSQI. From Table 1/ Fig 3, p-value is 0.032, a p-value<0.05 indicated that the data were statistically significant and valid. The Spearman's correlation coefficient, $r_s=0.133$ indicated that TTH and SQ shared a positive correlation.

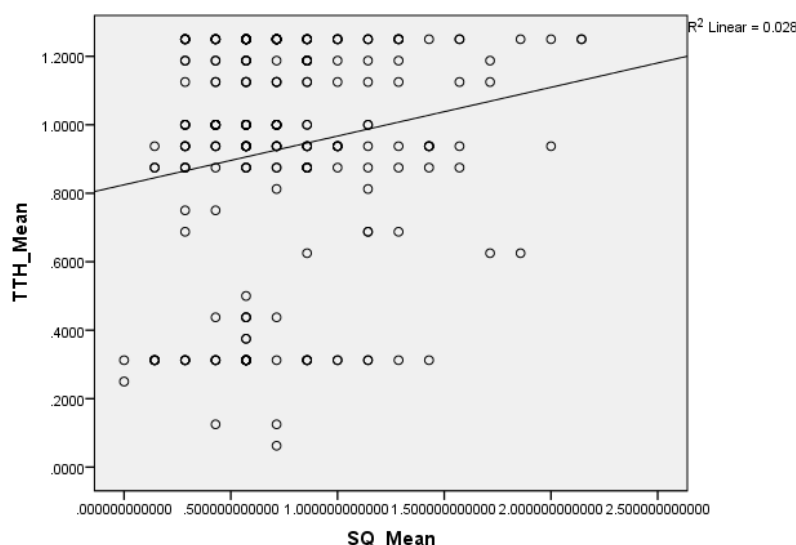


Fig. 3: Scatterplot of TTH and SQ

Table 1: Correlation between TTH and SQ

TTH		TTH	PSQI
	Correlation Coefficient	1.000	0.133
	Sig. (2-tailed)		0.032
PSQI	n	259	259
	Correlation Coefficient	0.133	1.000
	Sig. (2-tailed)	0.032	
PSQI	n	259	259

DISCUSSION

Headache disorders are under-diagnosed and under-treated among the student population, this is a serious

issue because headache attacks can lead to reduction in efficiency during study and decline in academic performance as well (5). The objectives of this study were to determine the prevalence of TTH, analyze the

SQ, and determine the type of correlation between the two variables, among PS and NS students from higher education institutions located in Klang Valley, Malaysia, during the COVID-19 pandemic. The general prevalence of headache among the respondents was high, 80.3% (208) of them reported to have experienced headache during the past 12 months. A study from Nigeria did a survey on headache, they revealed that the prevalence of headache was 42.3% (90) among the nursing students recruited (13). Another study conducted in India found out that the one year prevalence among undergraduate students from healthcare programs was as high as 73.1% (14). The result differences indicated that the prevalence of headache varies across region, race, and surroundings. Among the 208 respondents who experienced headache, 95.7% (199) of them fulfilled the criteria of ICHD-3 on probable TTH. Prevalence of TTH was relatively high among PS and NS students in this study, 76.2% and 77.9% respectively. As for now, no study was previously conducted in Malaysia or even in other regions, to measure and analyze the prevalence of TTH solely on PS and NS students. Hence, no baseline from the previous study can be used to compare with the results of this study. Alkarrash *et al.*, conducted a prevalence study of TTH in Syria, among medical, dental, and pharmaceutical students during the pandemic period, and they reported that the prevalence among their participants were 49.9% (385), which was almost half of their sample size (15). Therefore, the prevalence of TTH among students during this pandemic was considered high as 76.8% of the respondents experienced it at least once during the past 12 months.

During the data analysis of the responses of ICHD-3 questionnaire, traces of migraine were spotted among the respondents. Question 9, 10, 11, and 12 of the ICHD-3 TTH questionnaire were analyzed to determine the presence of symptoms such as nausea, headache pain aggravated by motion, photophobia, and phonophobia. Ideally these symptoms should be absent to establish a strong confirmed diagnosis on TTH. On the contrary, these symptoms were associated with migraine according to the criteria of ICHD-3 on migraine (16). The most reported migraine symptoms by the respondents were headache pain aggravation by motion and photophobia, 23.9% (62) and 23.6% (61) respectively.

One of the main discussions of this study was the SQ of the target population during the COVID-19 pandemic. The PSQI mean score of both PS and NS students combined is 5.12, indicating the sample population had poor SQ. In terms of prevalence, the prevalence of poor SQ was 50.2% (130), which is half of the study sample. Findings of other study revealed that 63.9% of the pre-clinical medical students had poor sleep quality (17). Results of a study from Saudi Arabia revealed the presence of a high prevalence of

poor sleep quality (70.4%) among medical students (18). This indicated that poor SQ was common among healthcare students across the globe, despite region, race, and culture. Alteration of SQ was determined by using the mean score of PSQI of a study that was conducted before the virus outbreak as a reference, the PSQI mean score of PS students in Malaysia before the pandemic was 6.00 (19). The PSQI mean score of PS students in this study was 4.72, with 5 as the cut off score indicating good or poor SQ and compared it with the previous study done in Malaysia, the SQ of PS students during the pandemic had altered in a good way, PS students in Malaysia had good SQ during the COVID-19 pandemic. According to a study conducted before the pandemic, the PSQI mean score of NS students in Malaysia before the pandemic started was 6.52 with a SD=3.17, the mean score was 0.58 higher than the current one (20). The PSQI mean score of NS students in this study is 5.94. Once again by referring to the PSQI cut off score, the PSQI mean score was 0.94 higher than the cut off score, indicating that NS students had poor SQ during the COVID-19 pandemic. There was a study in Malaysia that also proved that NS students had poor SQ during the pandemic, the reported PSQI mean score was 7.15, which was 2.15 higher than the cut off score of 5, which indicated poor SQ (21).

To date, studies were mainly focused on determining the associations between TTH and SQ, and it was made very clear that TTH and SQ were highly associated, with numerous evidence proving that. However, the linear relationship, which is the correlation between the two, was not being studied by researchers. Which makes this study to be the first to determine the correlation between TTH and SQ. The relationship shared by TTH and SQ was bidirectional, which meant these two variables contributed to one another. From previous data analysis it was also revealed that there was a positive correlation found between TTH and SQ of study samples during this COVID-19 pandemic. The Spearman's correlation coefficient, $r_s=0.133$, showed that the correlation between the two variables was weak. Any correlation coefficient that fell in between 0.10 to 0.39 would indicate the correlation is weak (22).

Future researchers are encouraged to draw their interest more in the topic of headache, as this is a rising issue. With the exact cause and mechanism of headache remain elusive, researchers are also encouraged on testing and finding out the possible answers to that, so that more treatment options that are effective can be provided. Data on prevalence of headache and their subtypes are highly on demand, as there are very few studies on them. Other than prevalence, questionnaire development in diagnosing types of headaches is highly suggested as well. As for now, although ICHD-3 is a common tool used in diagnosing headache, it must be used by healthcare

professionals to obtain a more accurate and precise diagnosis. Hence, development of a reliable and valid self-reported questionnaire for different types of headaches is very much needed. Sleep quality analysis on students specifically on different courses of study should be done more in the future. Other than that, researchers' attention is very much needed by physiotherapy students as they were extremely studied in all aspects.

CONCLUSION

The general prevalence of both headache and TTH during the pandemic were high, which indicated the need of taking actions to improve this issue. SQ of the respondents during the pandemic was revealed to be poor. Bedtime of respondents were deduced to be delayed in comparison to pre-pandemic period, based on the studies referred. Respondents were lacking sleep during this pandemic. The correlations between TTH and SQ had a weak positive correlation.

CONFLICT OF INTEREST

Authors have no conflicts of interest to declare.

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