



Original Article

Association Between Migraine Related Headache and Hypoglycemia due to Breakfast Skipping among Undergraduate University Students

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ARTICLE INFO

Key Words:

Migraine, Hypoglycemia, Breakfast Skipping, MIDAS Scoring

How to Cite:

Ali Chouhdary, M. H. ., Aslam, M., Amjad, A., Khalid, Z. ., Erum, W. ., Shehzadi, S., Fatima, S. F. ., Shahzadi Saleem, Z., Zahra, S. N. ., & Ashraf, A. (2023). Association Between Migraine Related Headache and Hypoglycemia due to Breakfast Skipping among Undergraduate University Students: Association Between Migraine Related Headache and Hypoglycemia. DIET FACTOR (Journal of Nutritional & Food Sciences), 4(02), 11-15. <https://doi.org/10.54393/df.v4i02.75>

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Received Date: 30th July, 2023

Acceptance Date: 13th September, 2023

Published Date: 30th September, 2023

ABSTRACT

Headache or migraine has emerged as a common health issue among university students. However, breakfast skipping habit is one of the common bad dietary practice among the students that is directly linked with the hypoglycemia. Whereas, hypoglycemia is one of the neglected complication that causes a person to suffer from headache/migraine related headache. **Objective:** To assess the link of breakfast skipping with hypoglycemia and headache/migraine among undergraduate students. **Methods:** A cross-sectional study was done in University of Lahore, Lahore from December 2021 to April 2022. The data were collected from 100 students by using convenient sampling method, using a self-formulated questionnaire, MIDAS tool and a glucometer. **Results:** Almost 69% students were suffering from headache/migraine while 46% students were suffering from hypoglycemia (p-value = 0.040). Approximately 36% students marked family history for headache/migraine. Breakfast skipping frequency among undergraduate students was 84% out of which 71% students were experiencing fatigue and lethargy (p-value = 0.039). Almost 75% students experienced hypoglycemia due to breakfast skipping and 85% students experienced headache/migraine due to hypoglycemia (p-value = 0.019). **Conclusions:** There is a significant link found between headache/migraine, hypoglycemia and breakfast skipping habit among undergraduate university students.

INTRODUCTION

Migraine is being classified under the diseases that are directly linked with headache. The severity of pain differs from one individual to the other and the pain categories from low to moderate and mild to elevated levels. Because of the pain intensity it's been a subject of concern for many people who are suffering from migraine [1]. The worldwide prevalence of migraine is 16.6% and the studies show that it's more prevalent in women than in men [2]. Almost 20% of university going students come under the burden of this disease [3]. Poor dietary habits, lack of sleep, stress and genetics are among the top factors that trigger migraine

[4]. Migraine is influenced by many internal and external factors. Not only dietary habits of the individuals affect the patients but also migraine alters the food choices of the patients affecting the portion size, choice and even the standard of the food. So, this shows that it is a two-way relation between migraine and diet [5]. While hypoglycemia can occur due to abnormal glucose balance. As the Insulin secretion drops, hypoglycemia occurs [6]. In hypoglycemic state, the serum glucose falls to 70 mg/dl [7]. Diet therapy used for the management of hypoglycemia is a calculated carbohydrate diet as it is helpful in maintaining

serum glucose levels [8, 9]. Despite the fact that breakfast is one of the main meals of the day, skipping breakfast is becoming very common with each passing day [10]. In youngsters, breakfast skipping vary from 1.3 to 74.7% globally [11]. Nutrient-rich breakfast consumption is directly associated with prevention of hypoglycemia [12]. Several research studies have shown that stress hormones are being released with breakfast skipping and resultantly, it triggers migraine C [13]. As migraine and hypoglycemia are associated factors, they can be avoided by having small frequent meals and avoiding longer meal gaps and consumption of carbohydrate rich foods [14, 15]. In hypoglycemia, there is a mass production of oxidizing agents which ultimately increases the oxidative stress in the body [16]. A study was conducted by Shahrakai et al., in University of Iran in 2011 to have an idea that how the daily hectic routine of the medical students likely to cause migraine among them [17]. The number of students selected were two hundred and ten and the data were collected by using a questionnaire. The results showed that there were many reasons that provokes pain among the sufferers but the most common ones were insomnia, and 52% of the university student suffer from migraine due to lack of sleep. Keeping oneself hungry for hours or skipping of meals contributed 39% in the pain initiation. Concluding the results stated that migraine was common among the students and there was a clear link seen between the increasing years of the degree with migraine [17]. Another study was conducted in 2013-14 at Jessero University of science and technology, Bangladesh by Amin et al., to access the glycemic values of hostilities and non-hostilities female students. A total of 100 students, out of which 50 hostilities and 50 non-hostilities were randomly selected. Standard laboratory methods were used for checking the fasting serum glucose levels. It was found after checking their blood glucose levels that 60 percent of non-hostilities and 68 percent of hostilities students were hypoglycemic. The hypoglycemia prevalence was higher among hostilities students as compared to the non-hostilities. It was also found that one of the reasons behind irregular blood glucose level was eating patterns or the dietary intake. The study concluded that the awareness related to healthy eating patterns and nutritious food intake is very important to regulate healthy body functioning [18]. The aim of this study was to find the link between hypoglycemic induced migraine pain and the breakfast skipping habit among university going undergraduate students.

METHODS

A cross sectional study was conducted in University of Lahore, for a time period of 4 months from December 2021 to April 2022. Data were collected from 100 students by

using convenient sampling technique. Data were taken with the help of self-formulated questionnaire, MIDAS test and glucometer for monitoring the blood glucose levels of the students. Data were analyzed and tabulated by using SPSS. Quantitative variables were analyzed by using standard deviation and mean values while qualitative variables were analyzed using frequencies and percentages.

RESULTS

As shown in Table 1, total 100 subjects participated in this study including 50 percent male and 50 percent female undergraduate university students. Mean age of the participants was 21.25 ± 2.09 years. Mean weight of the participants was 65.34 ± 9.36 kilogram. Approximately 73% students were belonging to the urban areas while 27% students were belonging to the rural areas. Approximately 08%, 70% and 22% students were respectively belonging to the low, middle and high socioeconomic status.

Table 1: Demographical Distribution of the University Undergraduate Students

Variables		
Age (years)		21.25±2.09
Weight (kg)		65.34±9.36
Gender	Male	50%
	Female	50%
Residential location	Urban	73%
	Rural	27%
Socio-economic status	Low	08%
	Middle	70%
	High	22%

Almost 69% students were experiencing headache/migraine on frequent basis while 31% students didn't have any frequent complaint regarding headache. On the other hand, 46% students were hypoglycemic (their blood glucose levels were less than 70mg/dL) while 54% students were not experiencing hypoglycemia (their blood glucose levels were greater than 70mg/dL) after checking their blood glucose levels by using a glucometer as shown in Figure 1. The significant p-value 0.040 was calculated for the correlation of the experiencing headache/migraine and hypoglycemia on frequent basis among undergraduate university students.

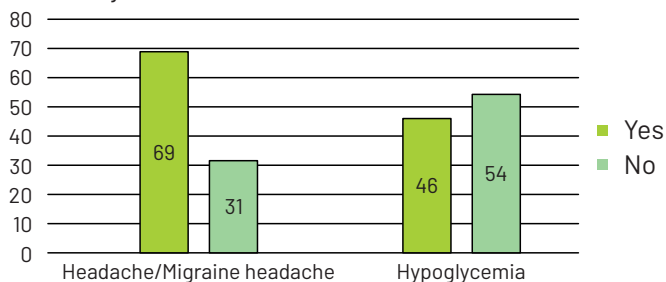


Figure 1: Correlation between experiencing headache/migraine

and hypoglycemia on frequent basis

Table 2 shows that approximately 31%, 16%, 22%, 07%, 10%, 10% and 04% students experienced headache/migraine 0-time, 1 time, 2 times, 3 times, 4 times, 5 times and 6 times per week subsequently. While 54%, 11%, 13%, 15%, 05%, 0% and 02% students experienced hypoglycemia 0-time, 1 time, 2 times, 3 times, 4 times, 5 times and 6 times per week subsequently. The significant *p*-value 0.046 was calculated for the correlation between frequency of headache/migraine and hypoglycemia per week among undergraduate university students.

Table 2: Comparison between frequency of headache/migraine and hypoglycemia per week

	Frequency of headache /migraine per week	Frequency of hypoglycemia per week	p-value
0 time	31	54	0.046
1 time	16	11	
2 times	22	13	
3 times	07	15	
4 times	10	05	
5 times	10	00	
6 times	04	02	

Figure 2 shows that 36% students had a family history for headache/migraine while 64% students didn't have any family history for the headache/migraine.

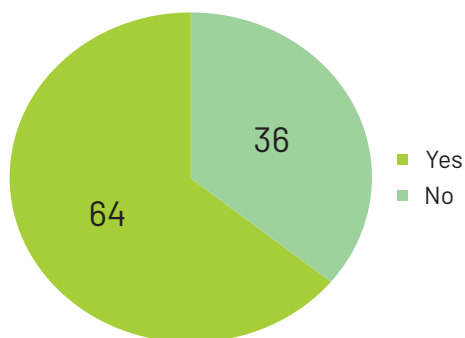


Figure 2: Family history of headache/migraine

According to Table 3, 48% male and 32% female students marked grade 1 disability. On the other hand, 12% male and 14% female students marked grade 2 disability. While 20% male and 28% female students marked grade 3 disability. Lastly, 20% male and 26% female students marked grade 4 disability. The non-significant *p*-value 0.140 was calculated for the correlation between gender and migraine related disability.

Table 3: Correlation between Gender and Headache/Migraine related disability

GENDER	Migraine Related Disability				p-value
	Grade 1	Grade 2	Grade 3	Grade 4	
Male	24	6	10	10	0.140
Female	16	7	14	13	

Sum of the 71% students were skipping their breakfast and had a complaint of always or somehow experiencing fatigue as well as lethargy while 13% students were skipping their breakfast but had no complaint of the fatigue and lethargy at all. Almost 15% students didn't skip their breakfast but still they were always or somehow experiencing fatigue and lethargy while 1% students did never skip their breakfast and also had no complaint of fatigue and lethargy. The significant *p*-value 0.039 was calculated for the correlation between breakfast skipping and experiencing fatigue and lethargy as shown in Table 4.

Table 4: Relation between breakfast skipping and experiencing fatigue and lethargy

Frequency of breakfast skipping	Frequency of experiencing fatigue or lethargy			Total	p-value
	Yes, always or usually	Yes, sometimes or rarely	Never		
1 Yes	16	55	13	84	0.039
2 No	07	08	1	16	
Total	23	63	14	100	

Sum of 75% students were always or somehow experiencing hypoglycemia due to the breakfast skipping while the sum of 85% students were always or somehow experiencing headache/migraine due to the hypoglycemia. On the other hand, 25% students had never experienced hypoglycemia due to the breakfast skipping while 15% students were never experiencing headache/migraine due to the hypoglycemia. The significant *p*-value 0.019 was calculated for the link between breakfast skipping, hypoglycemia and headache/migraine as shown in Table 5.

Table 5: Link between breakfast skipping, hypoglycemia and headache/migraine

		Breakfast skipping leading to the hypoglycemia	Hypoglycemia triggering the headache/migraine	p-value
1	Yes, always or usually	23	31	0.019
2	Yes, sometimes or rarely	52	54	
3	Never	25	15	

DISCUSSION

According to the results of this study, almost 69% undergraduate university students were suffering from headache/migraine collectively on the frequent basis. However, results of a cross sectional study in 2010 among the undergraduate students showed that 75% students had at least 1 headache episode in past 3 months [19]. The results of this study revealed that almost 36% students had the family history for the headache/migraine. Whereas, the results of a study conducted in 2020 among undergraduate students found that almost 22% students had the family history for the migraine headaches [4]. The results of this study revealed that 46% students were hypoglycemic while

64% students were not experiencing hypoglycemia. Major reason for the hypoglycemia among the students was found to be meal skipping or not eating enough. However, in 2016, the results of another study showed that 48% of students were hypoglycemic. The main reason for the hypoglycemia among the students was found to be breakfast skipping habit [20]. According to the results of this study, approximately 84% students were skipping their breakfast. Whereas, in 2017, the results of a study by Fareed and Waseer among medical students in Lahore revealed that 78% students were not consuming their breakfast on the daily basis [21]. According to the results of this study, almost 23% students always experienced low blood glucose levels due to the breakfast skipping while 76% students always or somehow suffered from the headache/migraine due to the breakfast skipping. However, in 2020, the results of another cross sectional study revealed that 34% students had low blood glucose levels due to the breakfast skipping. Moreover, 75% students suffered from the headache due to the breakfast skipping [13]. According to the results of this study, at an average 71% students were complaining of the fatigue and lethargy due to the breakfast skipping. Whereas one of the study conducted in 2007 showed that almost 46% males and 49% females were complaining of the fatigue. The major factors linked with fatigue were irregular meals, low physical activity rate, improper sleep and certain disease history [22]. The results of this study concluded that approximately 40%, 13%, 24% and 23% students categorized under the grade 1, grade 2, grade 3 and grade 4 migraine related disability respectively. The results of this study also showed that there was no significant relation between gender and migraine related disability. On the other hand, a study conducted on the undergraduate students in 2009 showed that 53% students marked little to no presence of the disability related to the migraine. 10% students marked mild disability due to the migraine. However, moderate to severe disability related to migraine among students was almost 37%. A significant relationship between gender and migraine related disability was also found [23].

CONCLUSIONS

Headache or migraine related headache is a very common health issue among the undergraduate university students that badly influences the educational performance and other daily routine activities of the students. However, low blood sugar level is one of the major neglected contributing factor towards the headache or migraine. Whereas, breakfast skipping habit is one of the leading causes of the low blood sugar levels and it is also a very common practice among undergraduate university students that causes

them to suffer greatly from the low blood sugar levels and ultimately induces the headache or migraine related headache among them.

Authors Contribution

Conceptualization: MHAC, MA, AA¹

Methodology: WE, ZK, SS

Formal Analysis: SFF, ZS, SNZ

Writing-review and editing: MHAC, MA, AA², WE, ZK, ZS, SNZ

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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