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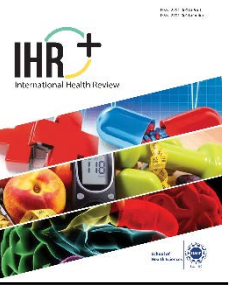

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# Prevalence and Impact of Migraine and Gastritis Issues among Pakistani Young Adults: A study of Educational Performance

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## Abstract

*Young adults worldwide are suffering from migraine as well as from gastritis problems. Reportedly, both of these situations has been occurring at the same time in young adults. For this purpose, a sample size of 30 subjects ranging from 10-24years, who were suffering from gastritis were selected in this study. To conduct the analysis, the subjects filled the questionnaires, in the presence of an investigator. This questionnaire comprised migraine differentiation questions, lifestyle factors, and the Migraine Disability Assessment test (MIDAS). MIDAS was used to estimate the impact of migraine on the class performance of young adults. With female to male ratio of 3.3:1, the average age of participants was 10-24. The prevalence of migraine associated with gastritis was found to be 53.3% significant. A significant relationship was identified between migraine, gastritis, and migraine in young adults. MIDAS test indicated that migraine had a significant impact on the class performance of young adults indicating that no impact, mild impact, moderate impact, and severe impact had a prevalence of 26.7%, 30%, 26.7%, and 16.7%, respectively. Hence, significant associations were found between migraine and gastritis in the young adults. Shocking alteration in the lifestyle of Pakistani community was seen, while conducting this study. Further studies can be conducted to understand the factors associated with day-by-day altering trends in the country.*

**Keywords**: educational performance, gastritis problems, lifestyle factors, migraine, young adults

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## Introduction

The most common complaint worldwide addressed by adolescents is headache [1]. Approximately, 2.7-10% of children suffer from migraine, which is characterized by intense and throbbing pain usually followed by vomiting as well as avoidance of exposure towards light and noise [2]. However, after puberty gender differences, it have been reported that the rate of migraine is high in females rather than in males, which is 2.5% [3].

Overall, 12-15% of the world's population suffers from migraine, which is divided into 4 main types, migraine with and without aura, cluster headache, and others. Common symptoms of migraine are namely, photophobia, headache, vomiting, and nausea [4]. The onset of migraine includes the initialization of pain at the back of the neck, which is the brainstem then expansion and contraction of vessels starts due to vasomotor dilation, leading to activation of medulla nerve cells. Thereby, resulting in the release of neuropeptide. Serotonin and reserpine both are also contributing factors in migraine [4].

Migraine has the tendency to affect the life of the person as well as people related to him/her at any stage of life [5, 6]. Previous researches have reported negative outcomes in children related to their school performance, school attendance, and abdominal pain due to the presence of migraine [7]. In adolescents, migraine affects their school performance, attendance, family as well as the quality of their life [8-10]. The rate of probable migraine (PM) is highest among adolescents followed by episodic migraine (EM), however, EM and CM have a major effect on the class performance of adolescents [11].

Several comorbid diseases are associated with the onset of migraine. Comorbidity is the presence of another disease with a specific situation [12]. Migraine is associated with modifiable risk factors, such as caffeine consumption, smoking, meal skipping, and many more [13]. Gastritis is also considered to be one of them. Since 1900, abdominal pain and migraine had been reported in children. Abdominal migraine in children is associated with migraine, vomiting, nausea, and abdominal pain [14].

A study was conducted to understand the comorbidity of migraine with other conditions such as gastritis, hypercholesterolemia, and head trauma. This study confirmed that the prevalence of all fore-mentioned conditions is high among people diagnosed with migraine [15].

Gastritis is the most common issue worldwide especially in developing countries [16]. It is an inflammatory response of internal lining of the stomach, autoimmune responses, and chemical irritants comprising of H. pylori, which are major contributors of gastritis issues [17]. Either an increase in gastric acid or the presence of h. pylori result in the progression of gastritis in children [18]. In 2016, a study was performed on children suffering from gastritis and it was assured that a decrease in calcitonin gene-related peptide (CGRP) vasodilator effect, and vasoactive intestinal peptide (VIP) (anti-inflammatory effect), as well as an increase in the substance P (SP)(inflammatory response), contributes to gastritis [19].

Association of migraine and gastritis has been reported in various researches. A study performed on children assured the link of migraine and GIT by indicating that the majority of the people in the study were suffering from gastritis, indicating a percentage of 92.9% [20]. Another study also reported the link between migraine and gastritis but it was primarily performed to understand the link between migraines with Notch [21]. H. pylori, which is a cause of gastritis, has also been identified as directly associated with migraine [22-24].

Although evidence is present to understand the association between gastritis and migraine, still this data is not enough to understand the association between migraine and gastritis. Therefore, the purpose of this research is to ensure the association between gastritis and migraine in adolescents. Additionally, to confirm the link between these situations, the impact of migraine on the class performance of adolescents in Pakistani community are primarily focused.

To conduct the current study a group of adolescents ranging from 13-19 years is targeted in this study. The objective of this research includes assessing the rate of gastritis and migraine in Pakistan, assuring the link of both gastritis and migraine as well as to study its impact on the class performance of adolescents.

## Materials and Methods

### Sample

Data was collected by hospitals situated in Gujrat, Pakistan. Consents were taken by the hospital organizations for the research. For this purpose, 30 young patients were included in this study, who visited hospital for gastritis

treatment. The patients were between 10-24 years fulfilling the criteria settled by World Health organization (WHO) for young adults [25]. In these cases, a specialist or a physician diagnosed Gastritis among the patients. Patients with severe conditions or emergencies were not added to the current sample study.

### Questionnaire

The questionnaire contained several closed-ended as well open-ended questions [26]. All these questions included questions related to duration, frequency, disability, and other specifications of headache to diagnose migraine and its impact on adolescents' performance. Other questions related to sleep, water, and others were included in the sample study.

### Headache Differentiation for Migraine Diagnosis

Questionnaires were filled by the subjects to identify whether the criteria settled by International headache society is fulfilled or not. By using the criteria given by the International headache society, migraine without aura was identified, which was the focus of the researcher [27].

**Table 1.** Criteria Given by International Headache Society for Migraine Differentiation Migraine Without Aura

| S # | Criteria |
|---|---|
| 1 | 5 attacks with 2-4 of following |
| 2 | Attack lasts for 2 hours to 3 days |
| 3 | Have 2 of the following |
| 4 | Intensity varies from medium to extreme (may/may not effect daily activities) |
| 5 | Location of headache is unilateral |
| 6 | Worsen due to daily activities even walking stairs Quality of headache is pulsating |
| 7 | At least one of the following is present with headache Vomiting/nausea |
| 8 | Phobia from sound and light |

### Gender-Ratio

Data-collection also included the objective to identify who suffered the most due to migraine. As previous studies showed the fact that female have suffered the most [28] but still this study focused gender ratio in young adults suffering from both gastritis and migraine.

### Impact on School Sector

To put light on the fact that which school sector suffered more due to gastritis and its link with their dietary choices. The school sector was divided into 2 main types, the government sector and the private sector.

### Dietary Choices

Additionally, all the dietary choices of young adults from both private and public sectors were assessed. Dietary choices were divided into 2 categories, outside junk food and homemade lunch.

### Triggers Associated with Pain

Triggers such as skipping meals, caffeine consumption, stress, and sleep were assessed to ensure if these triggers are associated with gastritis to cause and initialize migraine [29-31]. Skipping meal and stress are the major determinant to assess the link between gastritis and migraine.

### Headache Treatment Trends

To ensure the association between migraine and gastritis, questionnaire method was used. The questions investigating the treatment of migraine used by patients involved three (3) options. Medicine prescribed by physician $^{for}$ gastritis, Over-the-counter medications, and none. The response to first option, served as a best tool to ensure the link between both gastritis and migraine problems.

### Lifestyle Factors Associated with both These Conditions

Studies have assured in the past that several lifestyle factors are responsible for the onset of migraine as well as gastritis. Eating meals after a long time or skipping meals is one of them. Similarly, staying dehydrated for most of the time is also a contributor to gastritis as well migraine. Additionally, both mealtime, fluid intake, and sleep has also been reported to be a key contributor in the onset of both these situations. To assess the lifestyle factors in young adults, questionnaire also included three (3) questions related to lifestyle and habits of people suffering from migraine and gastritis.

### Impact of Migraine Without Aura

To evaluate the impact of migraine on the class as well as overall performance of young adults, migraine disability assessment questionnaire

was used (MIDAS) [32]. This questionnaire included five (5) questions estimating the days of the past 3 months in which participants missed their school, 50% or more productivity at school was reduced, household work was reduced, 50% or more productivity was reduced at home, and missed any leisure activity. After estimating the number of days, scoring was done to know how much migraine has affected the educational as well as the personal life of adolescents.

**Table 2.** Stages/Grades of Disability by Migraine

| No. of days | Stage/Grade of disability |
|---|---|
| 0-5 | No/little disability/ Grade I |
| 6-10 | Mild disability/ grade II |
| 11-20 | Moderate disability/ grade III |
| 21+ | Severe disability/ grade IV |

### Statistical Analysis

From young adults, children younger than 14 years were excluded from the study as they were not able to report their headache symptoms accurately. Descriptive statistics and crosstabulation were applied to analyze the variables.

Data was analyzed by using SPSS-software [33] and MS Excel [34]. All the data was reported in tabular form for better understanding.

## Results and Conclusion

### Sample's Characteristics

For convenience, young adults were divided into 3 main groups, the first group comprised of age group between 10-14 years, the second group comprised of age group ranging from 15-19, while the third and last group covered the adult phase ranging from 20-24. The estimated average age that was targeted for diagnosis was young adults from age 10-24, the highest mean value was estimated to be in the later adult phase ranging from 20-24. However, the patient falling under 14 were excluded after taking data from one (1) patient due to their inability to explain their condition.

**Table 3.** Percentage and Frequency of Different Age Groups

| Valid | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 10-14 | 1 | 3.3 | 3.3 | 3.3 |

| Valid | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 15-19 | 13 | 43.3 | 43.3 | 46.7 |
| 20-24 | 16 | 53.3 | 53.3 | 100.0 |
| Total | 30 | 100.0 | 100.0 | |

**Migraine Differentiation**

By evaluating all the subjects and by using migraine differentiation test, it was identified that 16 out of 30 patients were suffering with migraine with a prevalence of following symptoms.

**Table 4.** Migraine and Vomiting

| | | Migraine | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Vomiting | Count (Yes) | 12 | 6 | 18 |
| | % of Total | 40.0% | 20.0% | 60.0% |
| | Count (No) | 4 | 8 | 12 |
| | % of Total | 13.3% | 26.7% | 40.0% |
| Total | Count | 16 | 14 | 30 |
| | % of Total | 53.3% | 46.7% | 100.0% |

**Table 5.** Migraine and one-Sided Headache

| | | Migraine | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| One-sided | Count (Yes) | 13 | 6 | 19 |
| | % of Total | 43.3% | 20.0% | 63.3% |
| | Count (No) | 1 | 5 | 6 |
| | % of Total | 3.3% | 16.7% | 20.0% |
| | Count (unknown) | 2 | 3 | 5 |
| | % of Total | 6.7% | 10.0% | 16.7% |
| Total | Count | 16 | 14 | 30 |
| | % of Total | 53.3% | 46.7% | 100.0% |

**Table 6.** Migraine and Diarrhea

| | | Migraine | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Diarrhea | Count (Yes) | 5 | 6 | 11 |
| | % of Total | 16.7% | 20.0% | 36.7% |
| | Count (No) | 11 | 8 | 19 |

| | | Migraine | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| Total | % of Total | 36.7% | 26.7% | 63.3% |
| | Count | 16 | 14 | 13 |
| | % of Total | 53.3% | 46.7% | 100% |

**Table 7.** Migraine and Visual Changes

| | | Migraine | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| Visual changes | Count (Yes) | 10 | 2 | 12 |
| | % of Total | 33.3% | 6.7% | 40.0% |
| | Count (No) | 6 | 12 | 18 |
| | % of Total | 20.0% | 40.0% | 60.0% |
| Total | Count | 16 | 14 | 30 |
| | % of Total | 53.3% | 46.7% | 100.0% |

**Table 8.** Migraine and Phonophobia

| | | Migraine | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| Phonophobia | Count yes | 13 | 1 | 14 |
| | % of Total | 43.3% | 3.3% | 46.7% |
| | Count no | 3 | 13 | 16 |
| | % of Total | 10.0% | 43.3% | 53.3% |
| Total | Count | 16 | 14 | 30 |
| | % of Total | 53.3% | 46.7% | 100.0% |

**Table 9.** Migraine and Photophobia

| | | Migraine | | |
|---|---|---|---|---|
| | | **Yes** | **No** | **Total** |
| Photopobia | Count (Yes) | 12 | 2 | 14 |
| | % of Total | 40.0% | 6.7% | 46.7% |
| | Count (No) | 4 | 12 | 16 |
| | % of Total | 13.3% | 40.0% | 53.3% |
| Total | Count | 16 | 14 | 30 |
| | % of Total | 53.3% | 46.7% | 100% |

### Gender ratio

A number of 30 patients suffering with gastritis participated in this study. Out of the total 30 patients 23 were females (76.7%), while remaining seven (7) were males (23.3%). Thus, greater susceptibility was found to be in females as compared to males, which is explained in the following frequency table

**Table 11.** Gender Ratio

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 7 | 23.3 | 23.3 | 23.3 |
| | Female | 23 | 76.7 | 76.7 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

### Impact on School Sector

The researcher also setup a criterion for selecting patients on the basis of their institution, from private and public sectors to interpret, which sector intends to often burden the adult having signs of migraine and which sector suffered the most due to GIT irregularity. After analysis it was seen that there was no such discrimination between both sectors, the ratio was equal to some extent as seen in the table given below

**Table 12.** Comparison of School Sector Suffering

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Private | 14 | 46.7 | 46.7 | 46.7 |
| | Public | 16 | 53.3 | 53.3 | 53.3 |
| | Total | 30 | 100.0 | 100.0 | 100.0 |

### Dietary Choices of Young Adults Outside Home

To understand the high prevalence of gastritis in young adults in Pakistan, their dietary choices were also assessed and it was shocking that majority of the participants' preferred junk food or cafeteria food instead of homemade lunch. It is an indicator of changing dietary trends in a country like Pakistan; where in the past usually home lunches were preferred. Out of 30 participants 24(80%) were reportedly eating junk food, while 6(20%) of them were reportedly bringing their home lunches with them to school/college/university, which was mainly due to their gastric condition.

**Table 13.** Foods Eaten in School Hours

| | | Frequency | Percent | Valid Percent | Cumulative % |
|---|---|---|---|---|---|
| Valid | Junk food | 24 | 80.0 | 80.0 | 80.0 |
| | Home lunch | 6 | 20.0 | 20.0 | 20.0 |
| | Total | 30 | 100.0 | 100.0 | 100.0 |

**Triggers Associated with Migraine**

To check what triggered the patients the researcher chose some lifestyle factors to determine what causes the most pain. Therefore, some factors were chosen namely, emotional stress, skipping meals, caffeine intake, weather changes, and others. The highest ratio estimated was to be found due to skipping meals and other factors that aggravated the intensity of pain. Skipping meals is also a common trigger associated with gastritis thus, the results assured the objective of this research that both migraine and gastritis problems are associated with each other.

**Table 14.** Trigger Factors Associated with Migraine

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Skipping meals | 7 | 23.3 | 23.3 | 23.3 |
| | Stress | 4 | 13.3 | 13.3 | 36.7 |
| | Caffeine | 1 | 3.3 | 3.3 | 40.0 |
| | Others | 2 | 6.7 | 6.7 | 46.7 |
| | Skipping meals and others | 16 | 53.3 | 53.3 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

So the results in this table assured the link between skipping meals and migraine (23.3%) as well as skipping meals and other factors (53.3%) thus, ensuring the link between gastritis and migraine. The researcher also determined the type of diet, which patients were consuming in their daily routine to figure out the actual cause and occurrence of gastritis. For this purpose, the researcher took two groups, a homemade food group and a junk food group. Estimated the top found results were of junk food eaters that triggered the symptoms.

**Use of Medication to Treat Headache**

To check what kind of treatments do the patients use in order to reduce their symptoms the researcher asked them about the type of medications they take, which varied due to symptoms of gastritis as well

as of migraine, but most of the participants (40%) reported that by taking the medications for gastritis their headache alleviated.

**Table 15.** Medications Most Commonly Used for Migraine Cure

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Pain killer | 7 | 23.3 | 23.3 | 23.3 |
| | Stomach medicines | 12 | 40.0 | 40.0 | 63.3 |
| | Unknown | 4 | 13.3 | 13.3 | 76.7 |
| | Both | 2 | 6.7 | 6.7 | 83.3 |
| | None | 5 | 16.7 | 16.7 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

**Lifestyle Factors Associated with the Condition**

In the questionnaire, the researcher also asked about their daily eating, sleeping, and water intake patterns. Most of the cases were found to be deficient in all these three parameters due to, which symptoms aggravated. Reportedly, 13 participants were drinking 7-8 glasses of water/per day, while the remaining 17 were dehydrated stating that they take no more than three (3) glasses of water/per day.

**Table 16.** Young Adults Consuming Adequate Water

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 13 | 43.3 | 43.3 | 43.3 |
| | No | 17 | 56.7 | 56.7 | 56.7 |
| | Total | 30 | 100.0 | 100.0 | 100 |

The eating pattern was more irregular in young adults than the water consumption pattern. Only 5 (16.7%) participants reported that they eat on regular intervals, while the other 25(83.3%) had irregular eating pattern which is also a reason to trigger the 'skipping meals' mentioned above.

Following table indicates all our findings related to the eating patterns of young adults

**Table 17.** Young Adults Having Regular Eating Habits

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 5 | 16.7 | 16.7 | 16.7 |
| | No | 25 | 83.3 | 83.3 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

Not only the dietary patterns of young adults are changed in Pakistan but their sleeping patterns have also changed. Only seven (7) participants out of 30(7%) reported having a regular sleep pattern while the remaining 23 (76.7%) reported sleeping late at night resulting in sleep deprivation.

**Table 18.** Young Adults Having Adequate Sleep

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Yes | 7 | 23.3 | 23.3 | 23.3 |
| | No | 23 | 76.7 | 76.7 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

### Impact of Migraine

Migraine disability assessment test was used to evaluate that headache has limited the life of young adults to much extent, which has significantly affected their educational performance by causing severe headache. The findings reported that except for the eight (8) participants (26.7%), migraine has affected the lives of young adults and has affected their educational performance too. Reportedly, five (5) participants were suffering from severe disability, eight (8) with moderate disability, while the highest disability was in the mild stage affecting nine (9) participants.

**Table 19.** Impact of Migraine on School Performance of Young Adults by Using MIDAS

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No disability(0-5) | 8 | 26.7 | 26.7 | 26.7 |
| | Mild (6-10) | 9 | 30.0 | 30.0 | 56.7 |
| | Moderate (11-20) | 8 | 26.7 | 26.7 | 83.3 |
| | Severe (21+) | 5 | 16.7 | 16.7 | 100.0 |
| | Total | 30 | 100.0 | 100.0 | |

## Discussions

Various past studies have reported a lot of work and surveys on gastritis and migraine prevalence, intensity, and physiology. However, this research includes a study based on the association between gastritis and migraine, which has not been previously reported and a number of people who are unaware of this association. Along with this research, this topic revealed a mild ratio of migraine and gastritis. It was also determined that the current

eating habits of young adults in Pakistan showed that people are moving towards unhealthy and ignorant dietary patterns, which has significantly raised the condition of gastritis and migraine issues. Lifestyle factors are considered to be very important in terms of these ailments because they have a major impact on them. This innovation in this research has led to propose better health habits and options to overcome this condition. At the development level, migraine is related to unfitting eating behaviour. In children, Autism is most reported in them. The prevalence of migraine and association with unfit eating patterns depend upon the methods, which are used to collect data, and depend on the characteristics of the individual sample.

The researcher gets different estimation in a wide variety due to the criteria; we use in a particular population. Therefore, the method used in this study, was to check the prevalence of gastritis associated with migraine, among adolescents from different hospitals in different districts. This study was carried out at the outpatient hospitals of the non-communicable disease (NCD) department. The data was collected from thirty (30) adolescents, patients suffering from gastritis with migraine.

Majority of adolescents suffering from gastritis were found to have pain intensity ranging from mild to moderate, with a mean value of 26 % (S.D 1.06). In this study, those adolescents that are suffering from gastritis are related to migraine mostly ranging from 20-24 years of age. With definite female predominance as females were represented having 23.3% of the total percentage.

The main triggering factor noticed for this condition is eating out of home mostly and not eating meals at proper intervals due to, which they don't fulfill the requirement of dairy products and vegetables. They eat a lot of junk and street food and nutritional deprivation occurs as a consequence. During clinical examination, these patients mostly suffered from photophobia, nausea, phonophobia, vomiting, diarrhea, constipation, numbness, visual changes, and worm infestation.

It is estimated that migraine was more common among adolescents who were malnourished. Approximately, 43.3% of adolescents belonged to private sector institution whereas 56.7% belong to public schools. People who are job holders or studying mostly skip their meals and develop inappropriate eating behaviour and tend to have higher ratio of developing

migraine with gastritis problems as compared to those who fairly take a healthy and timely diet.

## Conclusion

It is estimated that gastritis being a fairly common disease occurs in 50%-90% in Pakistani community. One of the main reasons that causes gastritis is the increased intake of unhealthy and fashion foods. Associating it with the second vastly growing ratio is that of migraine starting from early adolescent age these days. Therefore, it was the association between these two ailments was determined through findings of this study. A population of young adults ranging from 10-24 years of age from hospitals in Gujrat district of Pakistan were the targeted population. For this purpose, a questionnaire was prepared that included questions regarding their daily life issues, which included their diet, medication, sleep patterns, activities, and level of pain. Another section of migraine disability test was attached at the end, which was used to assess at what ratio did the patients migraine affected their school, work, and home performance. After analyzing all the data was collected, it was concluded that from a total number of 30 people 16 were diagnosed with migraine and 14 were only diagnosed with gastritis significantly showing linked symptoms. The values were obtained by interpreting the data on SPSS using frequencies and bar charts by applying mean (M), variance (V), and standard deviation on them. Although both the groups do not have a significant difference but migraine-diagnosed group was prevalent mainly due to skipping their day to day meals, which tended to increase the severity and symptoms of people diagnosed with migraine problem.

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