

## Research Article

# Comparison of Heartburn among Boarders and Non-Boarders in Relation to Dietary Factors of Female Medical Students

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**Abstract**

Heartburn is a burning sensation behind the chest bone. It is a fairly common complaint associated with a gastrointestinal tract (GIT) disorder known as gastro esophageal reflux disease (GERD). This study was conducted to compare heart burn in boarders and non-boarders in relation to their food in exclusively female medical students in their 4th year of Bachelor of Medicine and Bachelor of Surgery (MBBS). A sample of 40 students was taken on random selection basis. We administrated anonymous survey to 20 boarders and 20 non-boarders that inquired about their eating habits, food choices, impact of carbonated drinks, tea/coffee, and spicy foods on their feelings of heart burn. It also included questions about frequency, time specification and any relation of heart burn to restaurant/hostel mess cooked food and junk-food. It was observed that most of the students had occasional complaint of heartburn and an association with condiments and spicy food was found. Better eating habits and home cooked food were found to cause less heartburn. It is concluded that boarders have relatively higher prevalence of heartburn than non-boarders of similar age.

**ABBREVIATIONS**

**GERD:** Gastroesophageal Reflux Disease; **MBBS:** Bachelor of Medicine and Bachelor of Surgery; **GIT:** Gastrointestinal Tract; **PPI:** Proton Pump Inhibitor; **LES:** Lower Esophageal Sphincter; **GP:** General Population; **QOL:** Quality of Life

**INTRODUCTION**

It is generally agreed upon that popular processed and junk food has led to a general decline in health of the masses [1]. However, the effect of a particular food or drink may vary among individuals. Heartburn is one such example of it. Many people have heartburn every now and again after eating a large meal, and will be familiar with the unpleasant burning feeling in their chest, just behind their breastbone. Occasional acid reflux is normal too [2]. Heart burn is a form of indigestion felt as burning sensation in chest. It is a common complaint of patients visiting the clinics and proton pump inhibitors (PPIs) are widely prescribed for it

[3]. Heartburn itself is not a disease but just a symptom. It is the most important symptom of GERD [4].

The exact cause and mechanism of GERD may vary; it covers a spectrum from anatomical abnormalities such as hiatal hernia to bacterial infection and even to the psychological stress [5]. It is a common clinical observation that certain foods cause heartburn, some by an effect on the lower esophageal sphincter and others by a direct "irritant" effect on the esophagus. The most common trigger for GERD symptoms is a meal; in particular, if the meal is high in fat [6]. According to a study, consumption of tobacco, chocolate and carbonated beverages and right lateral decubitus position are shown to lower pressure of the lower esophageal sphincter (LES), whereas consumption of alcohol, coffee and caffeine, spicy foods, citrus fruits, and fatty foods have no effect. There is an increase in esophageal acid exposure times with tobacco and alcohol consumption in addition to ingestion of chocolate and fatty food [7].

Consequences of GERD range from mild discomfort to potentially serious implications such as esophageal adenocarcinoma. A decrease in physical functioning was also seen [8]. Estimates suggest that up to 40% of the US general population (GP) report symptoms of gastroesophageal reflux disease (GERD) [9]. GERD prevalence estimates vary widely, but only East Asian studies show prevalence estimates consistently less than 10%. Evidence suggests an increase in disease prevalence since 1995 [10].

In daily clinical practice, this belief that certain foods increase the symptom of GERD leads to advising patients to avoid the suspected foods. Furthermore, since GERD symptoms are most commonly reported postprandial, the role of dietary components in inducing symptoms has been suggested. However, no definitive data exist regarding the role of diet and specific foods or drinks in influencing on GERD symptoms [11].

The aim of this study was to evaluate the relationship between GERD symptom, the heartburn and dietary factors.

## LITERATURE REVIEW

Research have been done for a long period of time to know more about its risk factors, and its prevalence among different population groups all over the world.

Many studies have showed the prevalence and incidence of GERD and its complications in Asian countries. A recent review proved the prevalence of GERD in eastern and south-eastern Asia and reported on the complications and risk factors [12].

The reported population prevalence ranged from 2.5 to 6.7% for at least weekly symptoms of reflux. Age, male sex, obesity, and hiatal hernia were the purported risk factors for GERD [13].

Higher prevalence was associated with history of unpurified water consumption, poor sanitary conditions, number of missing teeth, and smoking [14]. The prevalence of GERD (at least weekly symptoms) from a population-based survey in Turkey and Israel was 20% and 9.3%, respectively [15,16].

10-20% of western population showed weekly episodes of heartburn [17]. Studies for Pakistan has reported that majority of patients with GERD do not seek healthcare advice, and those who do, consult a physician or general practitioner. However, there is little or no evidence on the risk factors, management and prescription patterns for GERD in patients from Pakistan [18].

Tobacco has been thought to decrease sphincter pressure worsen GERD symptoms. A number of studies have explored the effect of coffee and caffeine on GERD but could not demonstrate that sphincter pressure or esophageal pH was affected. In terms of spicy foods, two studies were performed that looked specifically at sphincter pressure and pH effect, but they did not demonstrate any effect. As with coffee and caffeine, there have not been any studies in which patients have been matched to controls and told to eliminate spicy foods from their diet in order to determine the effect on heartburn symptoms. Citrus food and chocolate were also tested to have an effect. On a similar note, the effect of late-evening meals (defined as eating within 3 hours of going to bed) on GERD has been studied. As with all the other foods, there was some preliminary evidence that avoiding late-night eating might

improve esophageal pH association with GERD symptoms but no significant link was found [19].

A study in 2011 showed that nearly half the patients with heartburn showing evidence of GERD were overweight, and a majority consumed spicy meals. Proton-pump inhibitors were widely prescribed, and omeprazole was the preferred choice of drug [20].

A research was conducted in Dow medical college Karachi about prevalence of heartburn and GERD among medical students in 2008. It was the first research regarding incidence of heartburn among medical students in Pakistan. It was cross sectional study and was conducted by means of well-structured questionnaire which covered all issues regarding heartburn, its typical and atypical manifestations and impact of their lifestyle. Out of total 595 students, 74.6 % were females and among those 48.4% developed abdominal discomfort and 22.18% developed heartburn. In students who developed weekly heartburn complains, 7.8% were female students and 6.6% were male students. Dysphagia experienced by 15% students. The study showed significantly increase weekly episodes of heartburn among medical students as compared to general Asian population [21].

A cross sectional study was conducted to access the symptoms of gastro-esophageal reflux disease and associated risk factors among the rural school children of Valero India. 380 students were taken of 4-10th standard. The study showed the symptoms of reflux like abdominal pain were reported in 7%, heartburn in 1.3%, regurgitation in 2.4%, vomiting in 2.9%, difficulty in swallowing in 2.1%, sore taste in mouth in 0.8% of the children. The risk-factors for reflux, like caffeinated drinks were found in 45.3%, very spicy food in 12.1%, heavy meals in 2.4% of the children. Sleep disturbance was seen in 33.4% of the children [22].

A cross-sectional study was conducted in July-September 2015 at a campus of Damascus University. Risk factors for GERD were found to be two cups of tea and one to five cigarettes per day [23].

GERD not only has a significant impact on lifestyle of the persons but also affects sleep patterns of the person. Persons with sleep disturbances had depression and anxiety issues too. GERD patients also experienced day time sleepiness [24].

A study was conducted in India to know about prevalence of heartburn among medical students. Total 427 students were involved. Average age of students involved was ranging from 17 to 23 years. 48.9% students had GER symptoms at some time and this was equally distributed between the two genders. Twenty-three students were smokers or alcoholics or both. Forty-nine students were chronic NSAIDs users, 31 amongst refluxers and 18 in non-refluxers. Twenty of 122 first-year students (16.4%) had reflux symptoms; this increased to 63.2 among second-year students, 66.3% in the third year and 66.7% in the fourth year. Heartburn in combination with regurgitation (87 students; 41.6%) was the most common presentation. Regurgitation was marginally more common in boys. This showed GER is not uncommon amongst medical students. Symptoms were least prevalent in the first year of the academic course [25].

A study was conducted to determine the prevalence and risk factors for gastro esophageal reflux disease in a population of Nigerian medical students. The Carlson-Dent questionnaire was administered to medical students in the clinical phase of their training at the University of Nigeria. The prevalence of gastro esophageal reflux disease was 26.34%. There was an association between the use of caffeine containing substances (coffee and coolants) and the prevalence of gastro esophageal reflux disease (odds ratio = 2.2 and 2.015, respectively). This study showed increased incidence of GERD among Nigerian medical students and showed caffeine containing substances as risk factors [26].

A study was conducted to know about prevalence of symptomatic GERD among hospital personnel in India. Out of 1468 hospital personnel, the prevalence of GERD was found to be 28.5%. It was highest among clerical staff and least among nursing staff (3%). Eighty five percent of symptomatic GERD personnel were young. This study showed common presence of GERD among hospital prevalence, more common among doctors, clerical staff and housekeepers [27].

A research was conducted to study relationship between heartburn and dietary habits in Korea. It showed that noodles, spicy foods, fatty meals, sweets, alcohol, breads, carbonated drinks and caffeinated drinks were associated with reflux-related symptoms [28].

## MATERIALS AND METHODS

### Study design

Cross-sectional study

### Study population

The study population consisted of undergraduate female medical students of Fourth (4th) professional MBBS of Punjab Medical College Faisalabad, Pakistan.

### Duration of study

From June 2016 to August 2016

### Place of study

Punjab Medical College, Pakistan

### Sample Unit

Sample unit was each student from female students of Fourth Professional MBBS

### Sampling Technique

Non-probability (convenient sampling)

### Sample Size

Total sample size was 40 female undergraduate medical students of Fourth professional MBBS and consisted of 20 boarders and 20 non-boarders.

### Data Collection

The questionnaire was created online using Google Survey Forms. Data was collected online, in June and July of 2016. The study subjects were informed that the information collected

would be anonymous; and participation would be totally voluntary. Boarders and non-boarders were provided the same questionnaire. Students' status as boarders or non-boarders, and age were noted. Questions were asked regarding frequency of complaint of heartburn, dietary habits, and association of certain food and drinks with the heartburn.

### Data Analysis

The filled questionnaires were checked for completeness of data. The data obtained from the completed questionnaires were analyzed in the computer by using Microsoft Excel. Percentages were calculated and presented in the form of tables. One figure was obtained using Google survey assessment. Descriptive statistics were applied.

### Ethical issues

To obtain the consent of students prior to data collection, a detailed explanation on the aim and objectives of the study was given; and confidentiality was ensured. Prior permission was obtained from the Ethics Committee of the institution for conducting the study. The purpose of the study was explained to the participating students and confidentiality was ensured. Informed consent was obtained from every student before filling the questionnaire.

## RESULTS AND DISCUSSION

Gastroesophageal reflux disease is a chronic disease of multi factorial etiology, where both environmental and genetic factors may play a role. Worldwide studies on various populations show that risk factors for GERD include age, excessive body mass, lifestyle factors (such as smoking, physical activity), and diet.

The most common symptom in GERD patients is heartburn in Western countries. Several studies have reported the prevalence of heartburn as 21%-37% to experience heartburn at least once a month and as 13%-25% to experience at least once a week or more frequently. However, the most frequent and bothersome symptom of GERD patients is acid regurgitation. This may be attributed to cultural and linguistic differences in symptom perception and interpretation. The term "heartburn" is not universally understood and there is no direct translation of the word "heartburn" in many languages. A multiethnic study showed that the term "heartburn" was understood by only 35% of white American subjects and the figure dropped to 13% for Asian patients [29].

It is a common belief that some dietary habits would aggravate GERD-related symptoms, such as large-volume meal, rapid food intake, and irregular food intake, eating between meals or late-evening meals. Physicians often advise patients with GERD to change their dietary habit and lifestyle. However, the evidence to support such recommendations of lifestyle modification has not been well substantiated. In several studies investigating the effect of dietary habits on gastroesophageal reflux, the results have not been consistent. In our study, the habits (large-volume meal, rapid food intake, eating between meals and late-evening meals) showed statistical significance [11].

This is thought to be the first study comparing the frequency of heartburn among boarders and non-boarders in medical

college students of Pakistan. In this research, although most of the students complained of heartburn 'occasionally', 35% of non-boarders and only 15% of boarders said they never had it. However, there was a significant 1% in non-boarders who complained of heartburn of whole week which was just 1 response. Other answers such as once a week or twice a week were seen in boarders, and non-boarders complained only occasional heartburn.

In this study, we showed that spicy food induced heartburn. Biryani is a favorite food and showed heartburn more than other foods. A recent study showed that very low-carbohydrate diet in individuals with GERD significantly reduces distal esophageal acid exposure and improves symptoms. A second explanation for our findings is that biryani is generally made with lots of spices, which is more likely to precipitate the reflux related symptoms. Other possible explanation is the high salt intake. It has been demonstrated that salt intake seems to be a risk factor for reflux symptoms.

Although the trend of eating from outside or spicy foods didn't differ in boarders and non-boarders, more boarders complained of heartburn with spicy food. We also found that reflux-related symptoms were associated with fatty meals, sweets, carbonated drinks and caffeinated drinks. These results are consistent with several physiological studies which have shown a decrease in lower esophageal pressure and an increase in esophageal acid exposure in response to ingestion of a variety of food items.

A systematic review (44) evaluated the effect of dietary and other lifestyle modifications on lower esophageal sphincter pressure, esophageal pH, and GERD symptoms. Consumption of tobacco (12 trials), chocolate (2 trials), and carbonated beverages (2 trials) and right lateral decubitus position (3 trials) were shown to lower pressure of the lower esophageal sphincter (LES), whereas consumption of alcohol (16 trials), coffee and caffeine (14 trials), spicy foods (2 trials), citrus (3 trials), and fatty foods (9 trials) had no effect. There was an increase in esophageal acid exposure times with tobacco and alcohol consumption in addition to ingestion of chocolate and fatty foods. However, tobacco and alcohol cessation (4 trials) were not shown to raise LESP, improve esophageal pH, or improve GERD symptoms. In addition, there have been no studies conducted to date that have shown clinical improvement in GERD symptoms or complications associated with cessation of coffee, caffeine, chocolate, spicy foods, citrus, carbonated beverages, fatty foods, or mint. A recent systematic review concluded that there was lack of evidence that consumption of carbonated beverages causes or provokes GERD. In our research, similar results were seen. Most of the people opted for condiments as primary source of heartburn. Other foods included citrus fruits and they stood the second larger culprit for heartburn. Chocolate was also chosen by 4 participants. However, 15 participants that make 36.6% chose no food as a cause of heartburn. Many people were of view that many foods have a reputation for causing their heartburn including onions, garlic, hot and spicy foods, fried foods, and highly acidic foods such as tomatoes and citrus fruits. In addition, the ways they eat were as important as what they eat. People who eat quickly or who lay down immediately after food or eat too much are prone to heartburn. When people chew food

less, stomach produces more acid to breakdown food producing problems for them down the line thus portion size and amount are important too. A total of 58% people showed to chew food properly and 82% said they ate only according to the appetite and didn't eat more.

When relation with hostel mess is seen, only 30% of boarders eat regularly from hostel mess and 85% of them thought they have less heartburn with home cooked food.

Our study has some limitations. The first limitation of this study was the small sample size. Results could be more generalized if students from other colleges were also involved in the study. No factors other than dietary were explored as a cause of heartburn.

## CONCLUSION

We concluded from our study that heartburn was more prevalent in boarders than non-boarders. Avoiding certain kind of foods and improved eating habits reduces heartburn.

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