EXAMINING OUTDOOR MEALS CONSUMPTION AND ITS ASSOCIATION WITH DIGESTIVE HEALTH AMONG MEDICAL STUDENTS DWELLING IN HOSTELS OF KHYBER MEDICAL COLLEGE, PESHAWAR

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ABSTRACT

Objective: The objective of the study is to find the association between outdoor meal consumption and digestive health in students dwelling in hostels of Khyber Medical College, Peshawar.

Materials and Methods: A cross-sectional study was conducted among 297 undergraduate medical students dwelling in hostels of Khyber Medical College, Peshawar for one month. Data collection was carried out through an adapted questionnaire. A pilot test was performed for testing the questionnaire. Data was analyzed using Microsoft Excel and SPSS-20.

Results: The study revealed that most students (38.4%) consumed outdoor meals two to three times a week. Dinner was the most popular choice, favored by 38.4% of students. Dissatisfaction with hostel-cooked meals was a significant factor, with 57.6% of students citing it as their reason for choosing outdoor meals. Street food emerged as the most preferred type of outdoor meal, relished by 38.4% of hostel residents.

Conclusion: The study found that the majority of the hostel-dwelling medical students ate two to three times a week from outdoor sources, especially dinner. Dissatisfaction with hostel meals was a key reason, with street food being the most preferred option. A significant association was observed between outdoor meal consumption and digestive issues. These findings underscore the need to improve hostel meal quality and taste to promote healthier dietary habits.

Key Words: Outdoor meals; Hostel Dwellers; Digestive health.

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INTRODUCTION

Food plays a vital role in human health. It acts as the primary source of essential nutrients that are necessary for growth, development, and the maintenance of normal body function. Food is an ineluctable necessity for all species of the World. Humans, as well as animals, require food for their survival and the fulfillment of their nutritional requirements. [1] A proper nutritional diet is required by every person to maintain normal health and for protection against various diseases. The Dietary Guidelines for Americans offer recommendations on foods and eating habits that help meet nutritional needs, improve overall health, and prevent diseases. [2] College students' poor dietary habits may be linked to their increased independence, such as living away from their homes. [3] On the other hand, fast food has become a major part of modern life. The attraction to these foods is because of their tastes and advertisements all over the World. [5] Students spend a large portion of their monthly pocket money on junk food. These foods are commonly sold near educational institutions. These foods are high in calories, fats, and sugars but low in other essential nutrients. [6] Food choices significantly influence their dietary intake, which in turn affects their nutritional status. [7] It is natural for students to have a penchant for delicious foods, but they are often unaware of the detrimental effects on their health. Most of the students believe that fast foods are not harmful to their health. They enjoy the taste of these foods and don't take care of their effects on health. [8] Proper nutritious food is important for the physical health of a student. It also keeps the students mentally fit and healthy. Findings from a previous study show that nutritious and hygienic food is essential for the normal functioning of the brain. The consumption of outdoor food is strongly linked to eating fewer fruits,

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and vegetables and adopting a more comfortable lifestyle among people of all ages and genders. [9]

Students who are dwelling in hostels often compromise on their proper diet. This is due to many reasons, but the prime reason is the lack of proper supervision. Most of the hostel resident students don't follow dietary recommendations. Medical students living in the hostels face a demanding academic environment that often makes them resort to irregular eating habits and increased consumption of outdoor meals, such as fast food which satisfies them quickly with mostly no health benefit and lack of all essential nutrients. According to a survey, 50% of first-year students consume fried foods at least twice a week. [10] Despite their desirable taste, these foods are patterned by poor nutritional quality and can have significant health implications. Food lacking proper nutrition is harmful to both children and adults. [11]

Various digestive problems, including Gastro-esophageal Reflux Disease (GERD), irritable bowel syndrome (IBS), ulcerative colitis, peptic ulcers, celiac disease, lactose intolerance, gallstones, constipation, diarrhea, and gastritis, are often due to poor digestion. Research indicates that poor hygiene practices in food preparation can introduce harmful bacteria and contaminants, leading to infections and inflammation in the digestive tract. For example, peptic ulcers are known to be caused by Helicobacter pylori, which is frequently found in food that is not well-cooked[12]. Furthermore, eating meals high in fat and low in fiber, which are known to aggravate illnesses like GERD and IBS, can be the consequence of improper cooking techniques. Irritable bowel syndrome (IBS) affects 7% to 21% of the general population. [13] In addition, outdoor foods and mess-cooked meals lack a normal number of dietary fibers and vital nutrients, which is detrimental to the digestive system. [14] Chemical contaminants, especially heavy metals, may mix in outdoor meals and cause various digestive issues along with other health problems. [15]

Digestive issues like constipation, acid reflux, diarrhea, burping, bloating, nausea, stomach pain, etc., are common among medical students with poor dietary habits. Previous research shows that irregular eating patterns, such as consuming meals that are high in fats and sugars, can lead to digestive discomfort, bloating, infections, and other gastrointestinal problems. Although there is still a growing concern over the dietary habits of students, there is still only a paucity of research specifically examining the impact of outdoor fast food meal consumption on the digestive health of students residing in hostels of Peshawar University. Addressing this gap is crucial for developing targeted healthy measures that can support better dietary choices and improve digestive health outcomes in this population.

The basic objective of this cross-sectional study was to investigate outdoor meal consumption and its association with digestive health among medical students at Khyber Medical College, Peshawar hostels. This study will be crucial for all the students who are dwelling in hostels to retrieve knowledge and laurels in their respective fields. By examining the association between outdoor meal consumption and digestive health, this research will provide valuable information that will help students make healthier dietary choices. This will not only result in better health but also ensure that students have access to nutritious and hygienic food options. The findings of this study can be used to develop educational programs that promote healthier dietary habits among all hostel-dwelling students, especially medical students. By emphasizing the importance of proper nutrition and its impact on digestive health, these programs can encourage students to select a healthy and nutritious diet.

MATERIALS AND METHODS

A cross-sectional study was conducted from May 7th, 2024, to June 7th, 2024, among hostel-dwelling medical and dental students belonging to the four hostels of Khyber Medical College located in University of Peshawar, Pakistan. The inclusion criteria for the study comprised all undergraduate medical students residing in the hostels of Khyber Medical College (KMC) who provided informed consent to participate. The exclusion criteria included undergraduate students who were day scholars, those residing in hostels other than KMC hostels, and students who were not available in hostels for any reason.

Data was collected using an adapted questionnaire that included socio-demographic details, questions on outdoor meal consumption patterns, and ten items from the GSRS scale. The questions were designed based on hostel dwellers' preferences for outdoor meals and common digestion issues they faced. The ten GSRS items, pretested and Likert-scale based, ranged from "No discomfort at all" to "Very Severe discomfort." Ten items of GSRS were about ten common digestion problems which were acid reflux, constipation, diarrhea, bloating, rumbling, stomach ache, heartburn, nausea, hunger pain in the stomach, and burping. Questions on outdoor meal consumption were formulated after reviewing current literature and observing students' behavior. A pilot tested 30 initial responses and validated the questionnaire. The questionnaire began with a brief explanation of the study's purpose and was circulated online in college and hostel groups, and later sent to the personal numbers of hostel-dwelling students. Researchers gave instructions on how to fill out the questionnaire during its distribution.

Data was analyzed using IBM SPSS Statistics 20 and Microsoft Excel. First, the data from the online questionnaire was compiled in an Excel sheet. After compilation, the data was coded into SPSS-20 for analysis. Errors and inconsistencies were checked and addressed before

proceeding. Descriptive statistics were used to describe frequencies and percentages. To find the association between the frequency of outdoor meals consumption and digestion issues among students in different hostels, the Chi-Square Test of Independence was employed. The same test was used to check whether the type of outdoor meal influences digestion.

RESULTS

Figures 1, 2, and 3 show the socio-demographic profile of hostel dwelling students. The study included 297 respondents of which 191 (64.3%) were males and 106 (35.7%) were females. For the hostel, a maximum of 112 (37.7%) participants were dwelling in the Qasim Hall hostel. About half of the respondents (49.5%) were from Second Year MBBS/BDS.

Table 1 explains that the majority of the hostel-dwelling students (38.4%) consumed two to three times a week from outdoor sources whereas 16.1% didn't consume any meal from outside of hostels. Additionally, 31.3% of hostel living students preferred to eat one to two times a week from outdoor sources while 13.8% ate daily from places other than hostels.

Table 2 shows that the maximum hostel-living students, (38.4%) showed a proclivity for dinner whereas minimum hostel-residing students (5.4%) consumed breakfast from outdoor sources. Furthermore, 25.9% of hostel dwellers ate outdoor meals at the time of lunch.

Statistical analysis in Table 3 reveals that 38.4% showed their preference for street food whereas 30% of students from all hostels ate Fast food. The study further elucidated that 17.8% of students consumed both fast and street foods. In contrast, 16.5% of students didn't eat anything from outside of the hostel.

In Table 4, it is clear that most of the students (57.6%) ate outdoor meals because of dissatisfaction with hostel-cooked meals followed by 16.8% of students socializing with friends. However, only a small number of students (9.1%) consumed outdoor meals because of convenience.

The results of the Chi-square Test of independence in Table 5 indicated that there is an association between frequency of outdoor meal consumption with digestion issues, with a significance (p) of 0.004, which is less than 0.05. As the correlation is significant, it implies that outdoor meals have significant effects on digestion in hostel-living students.

The above table further elucidates that students who didn't consume outdoor meals and students who ate one to two times a week from outdoor sources, a maximum of them, 42.9% and 35.5%, have complained of slight discomforts in digestion, respectively. In contrast, students who consumed two to three times a week and those who ate outdoor meals daily, most of them, 43.9% and 41.5%, claimed that they didn't have any discomfort in digestion, respectively. The table indicates that variation

Table 1: Frequency of outdoor meal consumption in students living in different hostels

Frequency of outdoor meal	Qasim Hall	Razi Hall	Cena Hall	Girls Hostel	Total (297)
I didn't consume	11(22.4%)	2(4.1%)	0(0%)	36(73.5%)	49(16.5%)
1-2 times a week	31(33.3%)	6(6.5%)	11(11.8%)	45(48.4%)	93(31.3%)
2-3 times a week	56(49.1%)	24(21.1%)	12(10.5%)	22(19.3%)	114(38.4%)
Daily	14(34.1%)	10(24.4%)	14(34.1%)	3(%)	41(13.8%)

Table 2: Timing of outdoor meal consumption in students dwelling in different hostels:

Time of meal	Qasim Hall	Razi Hall	Cena Hall	Girls Hostel	Total
I don't consume outdoor meal	11(24.4%)	2(4.1%)	0(0%)	36(73.5%)	49(16.5%)
Breakfast	8(50%)	3(18.8%)	5(31.2%)	0(0%)	16(5.4%)
Lunch	23(29.9%)	3(3.9%)	6(7.8%)	45(58.4%)	77(25.9%)
Dinner	56(49.1%)	24(21.1%)	12(10.5%)	22(19.3%)	114(38.4%)
All	14(34.1%)	10(24.4%)	14(34.1%)	3(7.3%)	41(13.8%)

Table 3: Frequency of type of outdoor meal consumption among students of different hostels:

	I didn't consume outdoor meal	Fast food (e.g., burgers, fries, pizza)	Street food (e.g., chicken karahi, kebabs)	Both
Qasim Hall	11(22.4%)	23(26.7%)	56(48.7%)	22(48.9%)
Razi Hall	2(4.1%)	8(8.9%)	23(20.4%)	9(20%)
Cena Hall	0(0.0%)	8(8.9%)	23(20.4%)	6(13.3%)
Girls Hostel	36(73.5%)	50(55.6%)	12(10.6%)	8(7.5%)
Total	49(16.5%)	89(30.0%)	114(38.4%)	45(17.8%)

Table 4: Reasons for consumption of Outdoor meals among students dwelling in different hostels

Reasons	Qasim Hall	Razi Hall	Cena Hall	Girls Hostel	Total (297)
I didn't consume outdoor meal	11(22.4%)	2(4.1%)	0(0%)	36(73.5%)	49(16.5%)
Dissatisfaction with hostel meal	66(38.6%)	21(12.3%)	31(18.1%)	53(31%)	171(57.6%)
socializing with friends	25(50%)	15(30%)	2(4%)	8(16%)	50(16.8%)
convenience	10(37%)	4(14.8%)	4(14.8%)	9(33.3%)	27(9.1%)

Table 5: Results of difference in digestion issues due to difference in frequency of outdoor meal

Digestion Problems	I didn't consume	2-1 times a week	3-2 times a week	Daily	Chi Square Value	P Value
No discomfort at all	18(36.7%)	24(25.8%)	50(43.9%)	17(41.5%)		
Slight discomfort	21(42.9%)	33(35.5%)	40(35.1%)	15(36.6%)		
Mild discomfort	10(20.4%)	19(20.4%)	16(14.0%)	8(19.5%)		
Moderate discomfort	0(0.0%)	12(12.9%)	8(7.0%)	0(0.0%)	12.963	0.044
Moderately severe discomfort	0(0.0%)	4(4.3%)	0(0.0%)	1(2.4%)		
Very severe discomfort	0(0.0%)	1(1.1%)	0(0.0%)	0(0.0%)		
Total (297)	49(16.5%)	93(31.3%)	114(38.4%)	41(13.8%)		

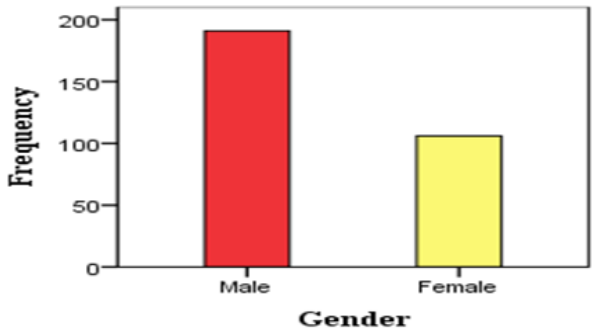

Fig 1: Frequency of Males and Females in a Sample

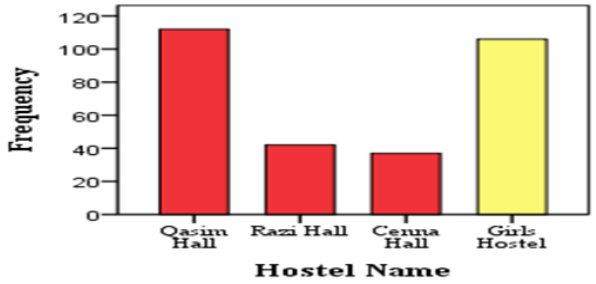

Fig 2: Students living in different hostels of Khyber Medical College

in digestion problems was associated with the frequency of outdoor meal consumption.

The Test of independence showed a P value of 0.044, indicating a significant association between digestion issues and the choice of outdoor meals.

This suggests that types of outdoor meal consumption had a significant association with digestive health outcomes.

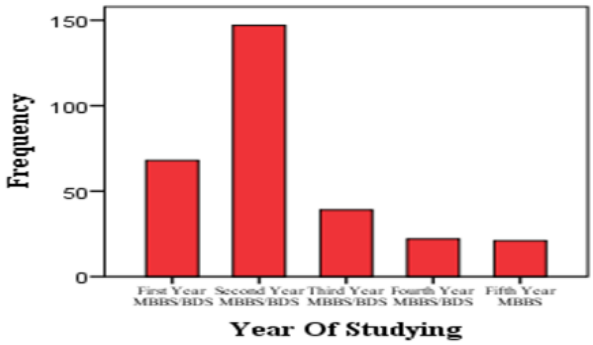

Fig 3: Students studying in different years of KMC/ KCD

DISCUSSIONS

In the present study, there is a higher proportion of male residents in hostels compared to females. Driskell et al. 200 conducted a study among students at a Mid-western land-grant university, revealing that approximately 25% of participants consumed outdoor meals two to four times per week on average. [16]

Another study by Bhavani et al. 2020 found that 16.0% of students rarely consumed outdoor meals, while an equal percentage reported daily consumption. In the current study, 13.8% of students reported consuming outdoor meals daily, and 31.3% consumed them one to two times per week.

Interestingly, 16.5% of participants did not consume outdoor meals at all, contrasting with Bhavani et al. 2020 findings, which indicated that 40.1% of students rarely consumed outdoor meals. [17]

Findings of research conducted on hostel-residing medical students of IGIMS, Shree et al. 2018, elucidated that the majority of the hostel-dwelling students (48.3%) preferred to eat dinner outdoors and then Lunch (21.6%). [18] There were very few students (2.3%) who ate breakfast from outdoor sources. These results are consistent with the present study which also showed that the majority of the hostel-dwelling students have a proclivity for dinner (38.4%), then lunch (25.9%) and only a few students (5.4%) compared to others consumed breakfast from places other than hostels. However, current findings contradict the findings of one of the previous research, according to a study conducted on students of Midwestern Land Grand University Driskell et al. 2006, the majority of men were consuming lunch from outdoor sources. [16]

In a present study, results indicated that 38.4% showed their preference for street food while 30.0% of students from all hostels ate Fast food. These results are like a previous study in which 30.1% of students had a liking for fast food.

However, in several other studies done worldwide, it is mentioned that fast food consumption was seen between 30.3% to 93.5% of children Abdel Hady et al.2014, Masse et al. 2014 and Abuzaid et al. (2012). [19-21] One of the Studies conducted on the consumption of street food, it is enlisted that 45% of students preferred street foods Hassan et al. Another study found that about 41% of students consumed street foods. [22]

The results don't follow most of the results of previous studies regarding the reasons for consuming outdoor meal sources in which convenience was selected by most of the students as the prime reason for outdoor meals Vaida et al. 2013[23], Wilson et al. 2009[24], Fung et al. 1997[25]. Several other studies indicated that the majority of the students consumed because of socializing with friends Sharifirad et al. 2013, Fung et al. 1997. [25, 26]. However, according to current findings, most of the students preferred an outdoor meal because of dissatisfaction with hostel-cooked meals.

To find the association between frequency and type of outdoor meal consumption with digestion Chi-Square Test of independence was performed. The results of the Chi-Square Test of Independence revealed a significant association between frequency and types of outdoor meal consumption with digestion.

These findings are supported by one prior research by Niranjan et al. 2016 in India, who reported a 63.17% prevalence of gastrointestinal symptoms among medical college hostel residents. They suggested that these symptoms could be attributed to unhygienic mess conditions and frequent consumption of outside food. [27]

CONCLUSIONS

Our study has found that the majority of the students (38.4%) consumed outdoor meals two to three times a week, with dinner being the most consumed meal from outdoor sources (38.4%), primarily due to dissatisfaction with hostel-cooked meals (57.6%).

Street food was the most preferred outdoor meal among hostel dwellers (38.4%). A significant association was identified between the type and frequency of outdoor meal consumption and digestive discomforts. These findings highlight the critical need to improve hostel meal quality and promote balanced dietary habits to support the overall health and academic performance of medical students.

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Authors Contribution:

Following authors have made substantial contributions to the manuscript as under

Authors	Conceived & designed the analysis	Collected the data	Contributed data or analysis tools	Performed the analysis	Wrote the paper	Other contribution
Rafiq T	✓	×	✓	×	✓	×
Ahmad KA	✓	✓	×	✓	✓	×
Syed H	×	✓	×	×	✓	×
Abdullah	✓	✓	✓	×	✓	✓
Hussain J	✓	✓	×	✓	✓	×

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.