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Comparative analysis of dietary diversity and food consumption patterns among public and private University Students in Bangladesh

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Abstract

Introduction: University students represent a crucial period for establishing long-term dietary patterns and are particularly susceptible to nutritional challenges due to lifestyle changes. This study focuses on the dietary habits of university students in Bangladesh, a demographic undergoing significant changes in eating patterns amid urbanization and exposure to Westernized food cultures.

Aim: This study aims to investigate the socio-demographic characteristics and dietary patterns of university students in Bangladesh, distinguishing between public and private university attendees.

Methods: A descriptive, cross-sectional study conducted over four months at two public and two private universities in Bangladesh. The sample consisted of 296 students, selected through systematic random sampling. Data collection involved face-to-face interviews using a semi-structured questionnaire. Dietary diversity was assessed based on the last 24 hours' intake, and household food consumption scores were calculated over the past 7 days. Statistical analysis was performed using SPSS (Version 17) and Stata (Version 13).

Results: The study consists of approximately equal representation of students from public (48.63%) and private (51.37%) universities, with a slight male majority (53.87%). Significant economic disparities were found between students from public and private universities, impacting their monthly expenditures and dietary habits. Students from private universities displayed a more diverse diet, especially in higher consumption of vegetables, fruits, and protein sources. A notable correlation was found between economic status and dietary diversity, with private university students having higher food consumption scores.

Conclusion: The study highlights substantial socio-economic disparities between students from public and private universities in Bangladesh, significantly influencing their dietary habits. Findings emphasize the need for targeted nutritional interventions and educational programs to mitigate the gaps in dietary diversity and health among university students. The study provides valuable insights for public health policymakers and educators in understanding and addressing the nutritional needs and challenges of university students in Bangladesh.

Keywords: Dietary Habits; University Students; Socio-Economic Disparities; Bangladesh; Nutritional Diversity.

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1. Introduction

The dietary habits of university students have been a subject of growing interest in nutritional research. This cohort is at a pivotal point in developing long-term dietary patterns, as they are frequently discovering independence in their eating choices for the first time (Small et al., 2013). The shift in Bangladesh from traditional diets to more urbanized eating patterns—a characteristic seen in many developing nations—makes these decisions even more difficult (Bishwajit., 2015). University students, a crucial demographic, are especially susceptible to bad eating habits because of things like time restraints, limited resources, and exposure to Westernized food cultures (Sadia et al., 2021). Bangladesh offers a distinctive setting for researching dietary habits among college students because of its varied culinary culture and quick urbanization. A study by Kabir et al. (2018) has shown that university residency is a crucial period for developing healthy eating habits and adopting nutritious intake, forming a foundation for good health throughout life (Kabir et al., 2018). Due to unfamiliar surroundings and lifestyle modifications, eating habits frequently alter significantly after moving away from home to attend university (LaCaille et al., 2011). According to a cross-sectional study among Bangladeshi university students, most of the student body was of normal weight, with notable variations in eating habits and the incidence of obesity between male and female students (Akter & Hossain., 2023). This study is indicative of the changing food consumption patterns and sedentary behaviors among university students, reflective of broader epidemiological transitions in the country. Moreover, a study conducted by Mohammad et al. (2018) in the northeast part of Bangladesh emphasized the inadequacy of health awareness and dietary habits among university students. According to this study, many students did not know that they may have improved health, and many of them had unhealthy eating habits. The level of health awareness was substantially correlated with factors including smoking, perceptions of leading a healthy lifestyle, involvement in sports, and psychological aspects of eating habits (Mohammad et al., 2018). This study is significant as it provides crucial insights into the nutritional behaviors of university students. It provides a picture of the food intake, dietary diversity, and food frequency among university students and it also highlights the differences of food intake, dietary diversity, and food frequency between the students of public and private universities. This information is essential for public health policymakers and educators to develop targeted nutritional interventions and educational programs. Furthermore, it contributes to the broader understanding of how socioeconomic status impacts health and dietary choices, which is vital for addressing nutritional deficiencies and promoting overall well-being in the youth population of Bangladesh.

2. Methodology

It was a descriptive type of cross-sectional study. The study was conducted at four universities including two public universities and two private universities. The study population was all the students of the selected four universities. The study period was of four months from September 2018 to December 2018. The sample size was 296 which was calculated using the standard statistical formula ($n=z^2pq/d^2$). The samples were selected by following a systematic random sampling technique. Data collection was done by using a semi-structured questionnaire. The questionnaire was finalized after conducting a pre-test with a similar population at another university. Data were collected by conducting face-to-face interviews with the selected respondents. To assess the dietary diversity of the respondents, their last 24 hours' dietary intake data were recorded. To calculate the food consumption scores at the household level, information on household-level food consumption was collected for the past 7-days. For quality assurance, data were checked regularly by the researcher, and suggestions and guidelines were taken from the guide. Before starting the data analysis, data were cleaned by using the SPSS (Version 17) statistical package to remove the error from the dataset and get a correct result. Both SPSS (Version 17) and Stata (Version 13) statistical packages were used for the analysis of data.

To calculate the food consumption score, food items were allocated into 9 food groups, a combination of which has to be consumed daily to ensure a nutritionally sufficient diet. The key food groups are:

- Cereals (rice, wheat, potatoes, sweet potatoes, maize, etc.)
- Pulses, legumes, nuts, and seeds
- Vegetables
- Fruits
- Fish, meat, and eggs
- Dairy and dairy products
- Oils and fats
- Sugar
- Spices and condiments

Food consumption patterns of the households were determined by collecting information on the number of days the household consumed a series of food items during the week before data collection. Based on the nutritional importance of the food groups, they were assigned weights. The food consumption score (FCS) was determined by multiplying the frequency of consumption recorded for each food group by the weight of the food group (HFSNA, 2009).

To calculate the dietary diversity score, food consumed at the household level during the last 24 hours (day and night) was categorized into 12 food groups of which a combination of food groups needed to be consumed daily to have a nutritionally balanced diet. For each food group, the frequency or the number of days an item of the food group was consumed is tabulated by 0 (not eaten) or 1 (eaten). The HDDS was determined based on the score (between 0 and 15) achieved by the household for the last 24 hours (day and night) (FAO, 2011).

Before beginning the data collection, the examination convention was affirmed by the ethics review committee of the Faculty of Allied Health Sciences of Daffodil International University. The points and destinations of the investigation alongside its strategy, dangers, and advantages of this study were disclosed to the respondents in the local language, and afterward, informed consent was taken from every participant. Then it was guaranteed that all data and records would be kept secret and the strategy would be utilized uniquely for research purposes. Confidentiality and anonymity were maintained strictly.

3. Results

According to the findings of this study, it is revealed that a total of 48.63% of respondents were from public universities, and the rest 51.37% were from private universities. A total of 53.87% were male and the rest 46.13% were female. The majority of the respondents (35.46%) were from the humanities background followed by business studies (33.27%) and science (29.16%). Most of the respondents (35.19%) were in their first year. Above half (50.41%) of the respondents were aged between 21 to 25 years, followed by 48.23% of respondents who were aged between 16 to 20 years. Only 1.36% of respondents were aged more than 25 years. A total of 54.17% of respondents were urban residents and the rest 45.83% of respondents were residents of rural areas (Table 01).

Table 1 Socio-demographic characteristics of the respondents (n=296)

Variables	Number of respondents	Percentage
University category		
Public	144	48.63
Private	152	51.37
Sex		
Male	159	53.87
Female	137	46.13
Major background		
Science	86	29.16
Humanities	105	35.46
Business studies	98	33.27
Others	6	2.11
Study year		
1 st year	104	35.19
2 nd year	73	24.54
3 rd year	67	22.65
4 th year	47	15.92
Masters	5	1.70

Age		
16 to 20	143	48.23
21 to 25	149	50.41
More than 25	4	1.36
Residence		
Rural	136	45.83
Urban	160	54.17

A notable 27.43% of public university students come from households with an income below BDT 40,000, a bracket absent among private university students, a statistically significant difference ($P=0.041$). As household income increases, the proportion of public university students decreases while that of private university students rises, culminating in 58.69% of private university students coming from households earning over BDT 100,000, compared to just 3.50% from public universities. The mean monthly expenditure per student reflects this divide: BDT 6,834.67 (SD ± 243.56) for public university students and BDT 16,546.82 (SD ± 532.18) for private university students, with a notable P value of 0.007. Food expenses alone show a similar trend, with public university students spending BDT 2,852.07 (SD ± 56.42) and private university students spending BDT 8,041.48 (SD ± 124.39), also statistically significant ($P=0.019$) (Table 02). This data underscores the stark economic differences between students of public and private universities in Bangladesh.

Table 2 Comparison of Monthly Household Income and Student Expenditure Between Public and Private University Students in Bangladesh (n=296)

Monthly household income	Public university		Private university		P value
	Freq.	Per.	Freq.	Per.	
<BDT 40000	39	27.43	0	0	0.041
BDT 40001 - BDT 60000	55	38.13	13	8.47	
BDT 60001 - BDT 80000	33	22.59	17	11.36	
BDT 80001 - BDT 100000	12	8.35	33	21.48	
>BDT 100000	5	3.50	89	58.69	
Mean expenditure per student/month	6834.67 \pm 243.56		16546.82 \pm 532.18		0.007
Mean expenditure per student/month on food only	2852.07 \pm 56.42		8041.48 \pm 124.39		0.019

Table 03 shows the intake from different food groups by the respondents in the last 24 hours. A comparison has been shown here and the association has been checked by the Pearson chi-square test. The findings reveal that The consumption of starchy staples, legumes, nuts, other vegetables or fruits, eggs, and small fish/small dried fish are comparatively higher among the students of public universities whereas the consumption from other food groups such as dark green leafy vegetables, red/orange/yellow fruits, and vegetables, vitamin C-rich fruits, and vegetables, organ meat, large fish/Sea fish/large dried fish, flesh foods and small animal protein and miscellaneous (Drinks) is higher among the private university students. A significant association was found in the consumption of starchy staples, dark green leafy vegetables, red/orange/yellow fruits & vegetables, vitamin C-rich fruits & vegetables, small fish/small dried fish, dairy, and miscellaneous (Drinks) among the students of both public and private universities.

Table 3 Intake from different food groups by the respondents in the last 24 hours (n=296)

Food groups	Public university		Private university		Pearson chi-square
	Freq.	Per.	Freq.	Per.	
Starchy staples	141	98.17	141	93.06	Pr = 0.042
Legumes and nuts	125	87.14	126	83.20	Pr = 0.053
Dark green leafy vegetables	63	43.64	78	51.26	Pr = 0.028
ROY fruits	20	13.86	27	17.63	Pr = 0.047
ROY vegetables	26	18.26	31	20.18	Pr = 0.015
Vitamin C-rich fruits	13	8.92	17	11.37	Pr = 0.000
Vitamin C-rich vegetables	15	10.16	25	16.53	Pr = 0.003
Other vegetables or fruits	20	13.68	14	9.05	Pr = 0.128
Eggs	91	63.32	78	51.29	Pr = 0.069
Organ meat	0	0.00	3	2.03	Pr = 0.051
Small fish/Small dried fish	18	12.28	16	10.66	Pr = 0.032
Large fish/Sea fish/Large dried fish	21	14.46	32	21.19	Pr = 0.078
Flesh foods and small animal protein	103	71.23	117	76.83	Pr = 0.069
Dairy	31	21.19	60	39.26	Pr = 0.011
Miscellaneous (Drinks)	115	79.58	123	80.71	Pr = 0.110

The consumption of 7 or more food groups is much higher among the students of private universities compared to the students of public universities. The findings also reveal that the consumption of a lower number of food groups is higher among public university students. A significant association ($p=0.036$) was found in the comparison of the dietary diversity of the respondents (Table 04).

Table 4 Dietary diversity of the respondents (n=296)

Dietary diversity	Public university		Private university		P value
	Freq.	Per.	Freq.	Per.	
3 or less than 3 food groups	13	9.26	8	5.04	0.036
4 food groups	23	16.13	16	10.24	
5 food groups	26	18.04	33	21.89	
6 food groups	37	25.57	26	17.04	
7 or more than 7 food groups	45	31.00	70	45.79	
Total	144	100.00	152	100.00	

A total of 85.36% of respondents from public universities had acceptable food consumption scores whereas 90.24% of respondents from private universities had acceptable food consumption scores. The food consumption scores are significantly associated ($p=0.048$) with the types of universities (Table 05).

Table 5 Food consumption score of the respondents (n=296)

Food consumption score	Public university		Private university		P value
	Freq.	Per.	Freq.	Per.	
Acceptable/Good	123	85.36	137	90.24	0.048
Borderline	13	9.26	12	7.66	
Poor	8	5.38	3	2.10	
Total	144	100.00	152	100.00	

4. Discussion

A pivotal aspect of this study is the near-equal representation of students from public (48.63%) and private (51.37%) universities, showcasing a balanced mix in the higher education sector in Bangladesh. This distribution is somewhat unique compared to trends observed in other developing countries, where public universities often dominate in terms of student numbers. For instance, a study conducted in India showed a higher proportion of students in public universities due to their affordability and perceived quality of education (Kingdon, 2020). Gender distribution in this study, with a slightly higher percentage of male (53.87%) than female (46.13%) students, aligns with global trends in higher education. Gender distribution in this study, with a slightly higher percentage of male (53.87%) than female (46.13%) students, aligns with global trends in higher education. However, it's worth noting that the gender gap in higher education is narrowing in many parts of the world, including South Asia (Ilie & Rose, 2016). This shift towards gender parity is indicative of broader social changes and increased emphasis on female education. The economic disparities highlighted in the study, particularly the significant differences in monthly expenditures and household incomes between students of public and private universities, are a critical finding. The higher expenditure among private university students reflects a global trend where private education often demands higher financial investment from families (Mahmud, 2021). Similar patterns are seen in other South Asian countries, where private education is often associated with higher socio-economic status (Dahal & Nguyen, 2014). In terms of dietary habits, the study reveals distinct patterns between public and private university students, with the latter consuming a more diverse diet. This is in line with global research indicating that economic status often influences dietary choices and diversity (Enriquez & Archila-Godinez, 2022). The higher consumption of certain food groups like dark green leafy vegetables and red/orange/yellow fruits and vegetables among private university students could be attributed to their higher economic status, allowing them access to a more varied diet. The study also sheds light on the dietary diversity among university students, with those from private universities consuming more than seven food groups being significantly higher. This finding is consistent with studies conducted in other developing countries, which have shown a positive correlation between economic status and dietary diversity (Pellegrini & Tasciotti, 2014). Finally, the acceptable food consumption scores, higher among private university students, further emphasize the impact of economic disparities on dietary habits. This is a common theme in nutrition research, where economic capability often dictates food quality and quantity (Gombert et al., 2017).

5. Conclusion

The study presents a comprehensive analysis of the socio-demographic characteristics and dietary patterns of university students in Bangladesh, revealing a balanced representation across public and private universities, which contrasts with the dominant public university trend in many developing countries. The slight male predominance aligns with global higher education trends, reflecting a gradual shift towards gender parity. Notably, the study underscores significant economic disparities between students from different university types, influencing their dietary habits and diversity. Private university students exhibit a higher economic status, correlating with a more varied diet and better food consumption scores. These findings highlight the interplay between socioeconomic factors and student life, emphasizing the need for policy interventions to bridge the educational and nutritional gaps in the higher education sector. The study's insights are crucial for understanding the unique challenges and opportunities within Bangladesh's higher education system and offer a valuable perspective for comparative studies in similar socio-economic contexts.

Compliance with ethical standards

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Disclosure of conflict of interest

Regarding this work, the authors disclosed no conflicts of interest.

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Consent for publication

The permission of each author to publish this article has been obtained.

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