Breakfast Consumption Patterns and Dietary Diversity among Undergraduate Female College Students in Mumbai, Maharashtra

Ishita Mistry[1*], Rupali Sengupta[2]

Department of Home Science, Dr. BMN College of Home Science, Mumbai, India

***Corresponding Author**

DOI: https://doi.org/10.51244/IJRSI.2026.13010137

Received: 22 January 2026; Accepted: 27 January 2026; Published: 07 February 2026

ABSTRACT

Breakfast plays a crucial role in supporting overall physical and mental functioning. Regular breakfast consumption is associated with improved alertness, concentration, and healthier dietary patterns. Breakfast consumption patterns influence nutritional intake among young adults; however, evidence focusing on Indian female college students remains limited. This study assessed breakfast consumption patterns, dietary diversity at breakfast, and the association between breakfast frequency and dietary diversity among undergraduate female students in Mumbai, Maharashtra. A quantitative cross-sectional study was conducted among 150 females aged 18–22 years using purposive sampling. Data were collected using a Breakfast Survey Questionnaire and a Breakfast Food Frequency Questionnaire, with dietary diversity assessed according to Food and Nutrition Technical Assistance (FANTA) food group classification. Descriptive statistics and Spearman correlation analysis were performed using SPSS software, with statistical significance set at $p < 0.05$. More than half of the participants reported regular breakfast consumption, with lack of time identified as the most common reason for skipping breakfast. Most participants consumed breakfast at home and preferred foods that were quick and easy to prepare. Although a high dietary diversity score at breakfast was observed among the majority of participants, breakfast frequency showed only a weak and non-significant association with dietary diversity. The findings emphasize the need for nutrition education interventions that promote consistent breakfast consumption along with balanced inclusion of diverse food groups among young women.

Keywords: Breakfast consumption, dietary diversity, FANTA food groups, undergraduate college students

INTRODUCTION

Breakfast is an important meal that breaks the overnight fast and provides essential energy and nutrients necessary for optimal physical and cognitive functioning. Regular breakfast consumption has been associated with improved concentration, academic performance, and overall well-being among students (Ferrer-Cascales et al., 2018; Pereira et al., 2017). Despite these benefits, breakfast is one of the most frequently skipped meals among adolescents and young adults, particularly college students. Common reasons include time constraints, academic pressure, late waking hours, and lifestyle-related changes.

Previous studies have reported that approximately 40–50% of adolescent girls and young women frequently skip meals, especially breakfast (Omidvar & Begum, 2014; Poobalan et al., 2014; Thamarai & Radhai, 2022). Lack of morning appetite and preference for convenience foods further contribute to irregular breakfast habits (Shethe et al., 2024). Beyond meal frequency, the quality and variety of foods consumed at breakfast play a crucial role in determining overall diet quality.

Dietary diversity, often assessed using the Food and Nutrition Technical Assistance (FANTA) food group classification, serves as a simple indicator of nutrient adequacy. Breakfasts that include multiple food groups such as cereals, dairy, fruits, vegetables, and protein sources are associated with improved nutrient intake and healthier dietary patterns (Ferrer-Cascales et al., 2018; Pereira et al., 2017). Inclusion of both plant and animal protein sources further enhances dietary quality (Koochakpoor et al., 2021; Sheikhi et al., 2023).

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue I January 2026

Although several studies have examined breakfast habits and dietary patterns independently, limited research has explored the relationship between breakfast consumption frequency and dietary diversity at breakfast among Indian college students. Therefore, the present study aimed to assess breakfast consumption patterns, evaluate dietary diversity at breakfast, and examine the association between breakfast frequency and dietary diversity among undergraduate female college students in Mumbai, Maharashtra.

MATERIALS AND METHODS

Study Design and Objectives: A quantitative cross-sectional study was conducted among undergraduate female college students to assess breakfast consumption patterns and dietary diversity at breakfast. The objectives of the study were:

1. To assess breakfast consumption patterns among undergraduate female college students.
2. To assess dietary diversity at breakfast using the Food and Nutrition Technical Assistance (FANTA) food group classification and examine its association with breakfast frequency.

Ethical Approval: The study was approved by the Institutional Ethical Committee of Dr. BMN College of Home Science on 24 April 2025. The study was registered with the Clinical Trials Registry of India on 24 July 2025 (CTRI/2025/07/091680).

Study Setting and Participants: The study was conducted among undergraduate female college students aged 18–22 years in Mumbai, Maharashtra. A total of 150 participants were recruited using purposive sampling. Female students within the specified age group who were willing to participate were included in the study. Written informed consent was obtained from all participants prior to data collection.

Study Variables: The independent variable was breakfast consumption patterns, while the dependent variable was dietary diversity at breakfast.

Data Collection Tools and Procedure: Data were collected offline using standardized questionnaires. The Breakfast Survey Questionnaire was used to assess breakfast frequency, reasons for skipping breakfast, place of breakfast consumption, and factors influencing breakfast choices. The Breakfast Food Frequency Questionnaire was used to record foods consumed at breakfast, which were categorized according to the Food and Nutrition Technical Assistance III (FANTA) food group classification to calculate dietary diversity scores.

Statistical Analysis: Data were coded and analysed using SPSS software. Descriptive statistics including frequency, percentage, mean, and standard deviation were used to summarize the data. Spearman correlation analysis was performed to assess the association between breakfast frequency and dietary diversity. Statistical significance was set at $p < 0.05$.

RESULTS

Breakfast Consumption Patterns of the Participants

The breakfast patterns of the 150 participants were assessed using the breakfast survey questionnaire to understand the eating habits and preferences of the participants and presented in **table 1**.

Table 1. Breakfast Consumption Patterns of the Participants (N = 150)

Variable	Category	Percentage (%)
Breakfast frequency (days/week)	Daily	53
	Most days (4–6 days)	25
	Sometimes (1–3 days)	14

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue I January 2026

	Rarely (<1/week)	9
Reasons for skipping	Lack of time	64
	Not hungry in morning	28
	Weight control	8
Place of breakfast	At home	72
	On the way to college	17
	College canteen	11
Main factor influencing choice	Food that is healthy	25
	Food that is cheap	3
	Food that is quick to prepare	29
	Food that is available in my house	25
	Food that tastes nice	12
	Food I can eat on the go	5
Support from college	Yes	4
	No	96

Most participants reported consuming breakfast daily (53%), while 25% consumed breakfast on most days of the week. Lack of time was the most frequently reported reason for skipping breakfast (64%), followed by lack of morning appetite (28%).

The majority of participants consumed breakfast at home (72%), whereas others reported consuming breakfast on the way to college (17%) or at the college canteen (11%). Convenience emerged as a major factor influencing breakfast choices, with a preference for foods that were quick to prepare. Although most participants were aware of healthy eating practices, this awareness did not consistently translate into healthy breakfast behaviors, indicating a gap between nutrition knowledge and practice.

Analysis of the Breakfast Food Frequency Questionnaire revealed that cereal-based foods and dairy products were the most commonly consumed breakfast items. Fruits and vegetables were consumed moderately, while nuts and seeds were less frequently included. Eggs and flesh foods were rarely consumed, and fried or snack foods were reported mainly as occasional breakfast items.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue I January 2026

Diet diversity of the Participants

Breakfast items were classified based on the Food and Nutrition Technical Assistance (FANTA) food group classification (2014) to assess dietary diversity. The total Dietary Diversity Score ranged from 0 to 10. Based on FAO-style diet diversity score cut-offs, participants were categorized as: Low diet diversity score: 0–3 food groups; Medium diet diversity score: 4–5 food groups; High diet diversity score: ≥6 food groups.

Figure 1 depicted the dietary diversity of the participants by showing how many different food groups were included in their breakfast. It illustrated whether the participants had low, medium, or high diversity based on the number of food groups consumed.

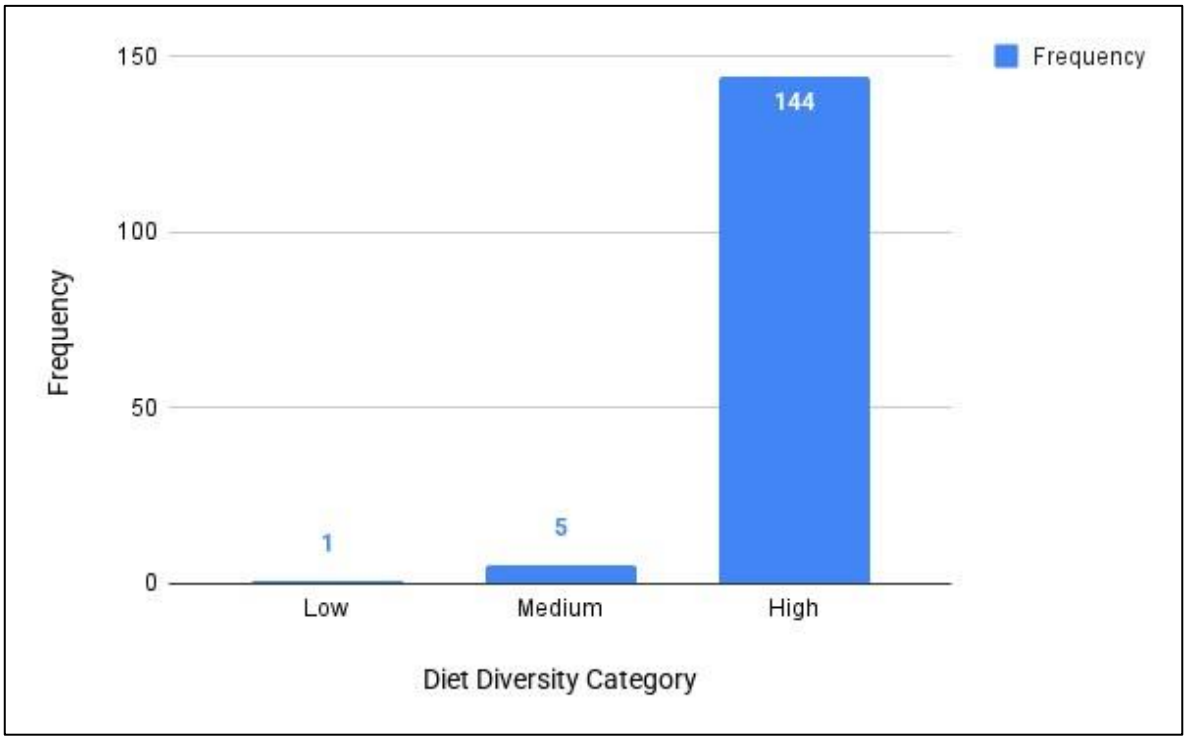

Figure 1. Diet Diversity Among the Participants

Figure 1 showed that 96% of participants (n = 144) had a high dietary diversity score, consuming six or more food groups at breakfast. Only five participants had medium and one had low dietary diversity. High scores indicate regular intake of cereals, dairy, fruits, vegetables, nuts/seeds, and protein sources, suggesting that breakfasts were nutritionally balanced and varied.

Spearman correlation analysis was performed to assess the association between breakfast frequency and dietary diversity, as the variables were ordinal in nature and did not follow a normal distribution, as shown in **Table 2**.

Table 2. Correlation between Breakfast Frequency and Diet Diversity Score (N = 150)

Variables	Breakfast frequency	Diet Diversity score
Breakfast frequency	1.000	0.135
Diet Diversity score	0.135	1.000

Table 2 depicted the correlation between breakfast frequency and diet diversity scores. It showed a weak positive correlation between breakfast frequency and diet diversity ($\rho = 0.135$). However, the association was not statistically significant ($p = 0.100$), indicating that breakfast frequency did not have a meaningful impact on the diet diversity of the participants.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue I January 2026

DISCUSSION

The findings of the present study indicated that a majority of undergraduate female college students consumed breakfast regularly, although irregular breakfast patterns were still observed. Lack of time was the most common reason for skipping breakfast, highlighting the influence of academic schedules and lifestyle factors on eating behaviours among young adults. Similar observations have been reported in earlier studies, which identified time constraints, late waking hours, and academic pressure as major barriers to regular breakfast consumption among college students (Omidvar & Begum, 2014; Poobalan et al., 2014; Thamarai & Radhai, 2022; Shethe et al., 2024).

The prevalence of home-based breakfast consumption and preference for quick-to-prepare foods suggested that convenience played an important role in influencing breakfast choices. Although many participants reported awareness of healthy eating practices, this did not result in optimal breakfast choices, indicating a gap between nutrition knowledge and actual dietary behaviour.

Dietary diversity at breakfast was found to be high among the majority of participants, suggesting relatively diverse breakfast patterns; however, these findings should be interpreted with caution as dietary diversity was assessed for a single meal occasion. These findings were consistent with studies by Ferrer-Cascales et al. (2018) and Pereira et al. (2017), which reported that breakfasts including cereals, dairy, fruits, and protein sources were associated with improved nutrient intake and better daily functioning. The inclusion of diverse protein sources such as dairy, nuts, legumes, and eggs observed in the present study aligned with findings by Koochakpoor et al. (2021) and Sheikhi et al. (2023), who emphasized the importance of protein variety for overall dietary quality.

Despite the high dietary diversity scores, the association between breakfast frequency and dietary diversity was weak and not statistically significant. This suggested that even participants with irregular breakfast consumption may still include a variety of food groups when breakfast is consumed. In contrast, previous studies have reported lower dietary diversity among college students who skipped breakfast or consumed limited food groups such as tea and biscuits (Hall et al., 2017; Sivaramakrishnan et al., 2012).

Overall, the findings highlight the need for targeted nutrition education interventions that encourage consistent breakfast consumption while maintaining dietary diversity among undergraduate female students.

CONCLUSION

The study revealed that most undergraduate female college students in Mumbai consumed breakfast regularly and included a variety of food groups in their breakfast meals, resulting in high dietary diversity. Although breakfast frequency demonstrated only a weak and non-significant association with dietary diversity, the findings underscore the importance of promoting regular breakfast consumption along with balanced inclusion of diverse food groups. Nutrition education interventions focusing on practical strategies for consistent and healthy breakfast habits may help improve diet quality among young women.

Limitations

This study has certain limitations that should be considered while interpreting the findings. The use of purposive sampling limits the generalizability of the results beyond the study population. Additionally, dietary diversity was assessed only for breakfast, and the Food and Nutrition Technical Assistance (FANTA) dietary diversity cut-off values were originally developed for whole-day or household dietary assessments. Therefore, the high dietary diversity scores observed in this study should be interpreted with caution. Furthermore, potential confounding factors such as socioeconomic status, living arrangements (hostel or home), academic schedules, and exposure to nutrition education were not assessed, which may have influenced breakfast consumption patterns and dietary diversity.

ACKNOWLEDGEMENTS

The authors sincerely thank all the participants for their cooperation and Dr. Rupali Sengupta for her guidance throughout the study.

Conflict Of Interest

The authors declare no conflict of interest.

REFERENCES

1. Alferez, J. S., & Moneva, J. C. (2020). Anxiety Level vis-à-vis Breakfast Habits of The Students. IRA International Journal of Education and Multidisciplinary Studies, 16(1), 48. https://doi.org/10.21013/jems.v16.n1.p8
2. Ferrer-Cascales, R., Sánchez-SanSegundo, M., Ruiz-Robledillo, N., Albaladejo-Blázquez, N., LagunaPérez, A., & Zaragoza-Martí, A. (2018). Eat or Skip Breakfast? The Important Role of Breakfast Quality for Health-Related Quality of Life, Stress and Depression in Spanish Adolescents. International Journal of Environmental Research and Public Health, 15(8), 1781. https://doi.org/10.3390/ijerph15081781
3. Hall, L., Tejada-Tayabas, L. M., & Monárrez-Espino, J. (2017). Breakfast skipping, anxiety, exercise, and soda consumption are associated with diet quality in Mexican college students. Ecology of Food and Nutrition. https://doi.org/10.1080/03670244.2017.1299010
4. Koochakpoor, G., Salari-Moghaddam, A., Keshteli, A. H., Afshar, H., Esmaillzadeh, A., & Adibi, P. (2021). Dietary intake of branched-chain amino acids in relation to depression, anxiety and psychological distress. Nutrition Journal, 20(1). https://doi.org/10.1186/s12937-021-00670-z
5. Omidvar, S., & Begum, K. (2014). Dietary pattern, food habits and preferences among adolescent and adult student girls from an urban area, South India. Indian Journal of Fundamental and Applied Life Sciences, 4(2), 465–473. http://www.cibtech.org/jls.htm
6. O'Neil, C. E., Byrd-Bredbenner, C., Hayes, D., Jana, L., Klinger, S. E., & Stephenson-Martin, S. (2014). The Role of Breakfast in Health: Definition and Criteria for a Quality breakfast. Journal of the Academy of Nutrition and Dietetics. http://dx.doi.org/10.1016/j.jand.2014.08.022
7. Pereira, Jaqueline & Castro, Michelle & Hopkins, Sinead & Gugger, Carolyn & Fisberg, Regina & Fisberg, Mauro. (2017). Prevalence of consumption and nutritional content of breakfast meal among adolescents from the Brazilian National Dietary Survey. Jornal de Pediatria. 94. 10.1016/j.jped.2017.10.004.
8. Poobalan, A. S., Aucott, L. S., Clarke, A., & Smith, W. C. S. (2014). Diet behaviour among young people in transition to adulthood (18–25 year olds): a mixed method study. Health Psychology and Behavioral Medicine, 2(1), 909–928. https://doi.org/10.1080/21642850.2014.931232
9. Shethe, Jannat & Mahin, Munir & Rahman, Md. Shamsur. (2024). Breakfast consumption patterns and nutritional status among private university going students. 3. 1-14. 10.5455/JPHCM.20241108054348.
10. Sivaramakrishnan, M., & Kamath, V. (2012). A typical working-day breakfast among children, adolescents and adults belonging to the middle and upper socio-economic classes in Mumbai, India – challenges and implications for dietary change. Public Health Nutrition, 15(11), 2040–2046. https://doi.org/10.1017/s1368980012002777
11. Stacy. (2016, April 7). How should foods be classified into food groups? Food and Nutrition Technical Assistance III Project (FANTA). https://www.fantaproject.org/node/1209
12. Thamarai, S. M., & Radhai, S. s. (2022, 05 06). A study on breakfast consumption and skipping patterns among college students in Coimbatore. World Journal of Advanced Research and Reviews, 14(02), 121128. https://doi.org/10.30574/wjarr.2022.14.2.0400