Section: Community Medicine

Original Research Article

NUTRITION, LITERACY AND DIETARY PRACTICES AMONG ADOLESCENTS: EVIDENCE OF A KNOWLEDGE–BEHAVIOUR GAP IN AN URBAN INDIAN SCHOOL SETTING IN WESTERN UTTAR PRADESH

Rakshita Ojha[1], Rajan Pathak[2], Sarvjeet Kumar[3]

[1]*Associate Professor, Department of Community Medicine, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India.*
[2]*Assistant Professor, Department of Microbiology, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India.*
[3]*Assistant Professor, Department of Community Medicine, Subharti Medical College, Meerut, Uttar Pradesh, India.*

Received *: 02/08/2026*
Received in revised form *: 29/08/2026*
Accepted *: 10/09/2026*

Corresponding Author:
Dr. Rakshita Ojha,
Associate Professor, Department of Community Medicine, United Institute of Medical Sciences, Prayagraj, Uttar Pradesh, India.
Email: rakshitaojha5may@gmail.com

DOI: 10.70034/ijmedph.2026.3.757

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 4908-4913

ABSTRACT

Background: Nutrition literacy is a key determinant of dietary behavior among adolescents. However, knowledge does not always translate into practice, particularly in urbanizing settings in India. **Objectives:** To assess nutrition literacy among school-going adolescents and examine the gap between nutrition knowledge and dietary practices.

Materials and Methods: A cross-sectional study was conducted among 348 students (grades 9–12) in a school in Meerut. A semi-structured questionnaire assessed socio-demographic details, nutrition knowledge (score range: 0–23), and dietary practices. Knowledge levels were categorized as good (>80%), fair (60–79%), and poor (<60%). Data were analyzed using descriptive statistics and Chi-square test.

Results: The mean knowledge score was 12 ± 2.5. Most participants had poor knowledge (72.13%). Unhealthy practices were common: 61.78% reported frequent snacking, 30.17% consumed processed snacks, and 61.78% purchased food from canteens. Meal skipping was prevalent (38.79%), and 16.09% skipped breakfast daily. No significant association was observed with gender or parental education ($p>0.05$), while class-wise differences were significant ($p<0.001$). A clear mismatch between knowledge and behavior was evident.

Conclusion: A significant knowledge–behavior gap exists among adolescents. Behavior-focused interventions and supportive school environments are essential to improve dietary practices.

Keywords: Nutrition literacy, adolescents, dietary practices, school health, India.

INTRODUCTION

Adolescence represents a critical period for the development of lifelong dietary behaviors, making nutrition literacy an essential determinant of present and future health outcomes. Nutrition literacy encompasses the ability to access, understand, evaluate, and apply nutrition-related information to make appropriate dietary choices. In recent years, it has gained prominence as a key public health strategy to address the growing burden of diet-related diseases. In India, the situation is particularly complex due to the coexistence of undernutrition, micronutrient deficiencies, and rising rates of overweight and obesity among children and adolescents, often referred to as the "double burden of malnutrition".[1,2,3,4]

Despite increasing awareness initiatives, studies indicate that nutritional knowledge among school-going children remains suboptimal and is often insufficient to influence actual dietary behaviour.[5,6,7,8] Rapid urbanization, changing food environments, and increased availability of processed and energy-dense foods have significantly altered dietary patterns among adolescents, particularly in urban settings.[9,10,11] These changes

are reflected in increased consumption of junk foods, sugary beverages, and irregular meal patterns, all of which contribute to poor nutritional status and increased risk of non-communicable diseases later in life.[12,13]

An important concern highlighted in recent research is the disconnect between nutrition knowledge and dietary practices. While some adolescents demonstrate a basic understanding of healthy eating principles, this knowledge does not consistently translate into healthier food choices.[14,15,16] Factors such as peer influence, family environment, socio-economic status, and the availability of unhealthy food options in school settings play a crucial role in shaping dietary behavior, often outweighing knowledge alone.[17,18,19] Furthermore, studies have shown that even when nutrition literacy is adequate, functional application—such as interpreting food labels or making healthier food choices—remains limited.[20,21,22]

Global evidence supports the association between nutrition literacy and dietary quality yet also emphasizes that knowledge alone is insufficient to drive behavioral change.[23,24] This gap underscores the need for comprehensive, behavior-focused interventions that integrate education with supportive environments. Schools serve as an ideal platform for such interventions, as they influence both knowledge acquisition and daily dietary practices among adolescents.

In this context, the present study was conducted among school-going children in Meerut, an urban setting reflecting the ongoing nutrition transition in India. The study aims to assess nutrition literacy and examine the extent to which this knowledge translates into actual dietary practices, thereby identifying the presence of a knowledge–behavior gap. Understanding this relationship is crucial for designing effective school-based and community-level strategies to improve adolescent nutrition and long-term health outcomes.

MATERIALS AND METHODS

Study Design and Setting

A school-based **cross-sectional study** was conducted among adolescents studying in grades 9 to 12 at Ved International School, Meerut, Uttar Pradesh, India. The study was carried out as part of a community-based research project under the Department of Community Medicine, Subharti Medical College, Meerut, Uttar Pradesh.

Study Population

The study population comprised school-going children aged approximately 14–18 years who were present on the day of data collection and provided assent to participate.

Sample Size and Sampling Technique

A total of **389 students** were approached using a **total enumeration sampling technique**. After excluding incomplete or inconsistent responses (n=41), the final sample size included **348 participants** for analysis.

Inclusion Criteria & Exclusion Criteria: Participants included in the study were students enrolled in classes 9 to 12 who were present at the time of data collection and had provided assent along with institutional permission. Students diagnosed with eating disorders or having medical conditions requiring strict dietary restrictions were excluded from the study. Additionally, questionnaires that were incomplete, inconsistent, or invalid were omitted from the final analysis.

Study Tool and Data Collection

Data were collected using a **semi-structured, pre-validated questionnaire** adapted from previous studies. The tool consisted of three components:

1. **Socio-demographic details:** Age (class), gender, parental education, and primary source of nutrition information
2. **Nutrition Literacy Assessment:** A structured questionnaire comprising 23 items assessing knowledge of nutrients, dietary practices, and basic nutrition concepts. Each correct response was scored as "1" and incorrect/unknown responses as "0," yielding a total score ranging from 0 to 23. Based on percentage scores, participants were categorized as: **Good:** >80%, **Fair:** 60–79% & **Poor:** <60%
3. **Dietary Assessment:** Included questions on meal patterns, meal skipping, breakfast habits, snacking behavior, reasons for skipping meals, and frequency of food consumption using a food frequency questionnaire.

Data collection was conducted in the classroom setting. The questionnaires were self-administered under supervision, and clarifications were provided to minimize misinterpretation.

Data Management and Statistical Analysis

Data were entered into **Google Sheets** and analyzed using **Jamovi statistical software**.

- **Descriptive statistics:** Frequencies and percentages were calculated for categorical variables, while mean and standard deviation were computed for continuous variables such as nutrition knowledge scores.
- **Inferential statistics:** Association between nutrition knowledge levels and socio-demographic variables (gender, class, parental education, and source of information) was assessed using the **Chi-square test**. A **p-value <0.05** was considered statistically significant.

The knowledge–behavior gap was interpreted by comparing nutrition literacy levels with dietary practices such as meal skipping, snacking habits, and consumption of processed foods.

Ethical Considerations: Permission to conduct the study was obtained from the school authorities. Participation was voluntary, and informed assent was obtained from students. Confidentiality and

anonymity of the participants were strictly maintained throughout the study.

RESULTS

1. Socio-Demographic Characteristics

A total of 348 students were included in the final analysis. Males constituted the majority (59.48%), while females accounted for 40.52%. The distribution across classes showed that students from class 10 formed the largest group (29.89%), followed by classes 9 and 11 (each 25.86%), and class 12 (18.39%).

Parental education levels were relatively high. Among fathers, 35.63% were postgraduates and 33.91% graduates, whereas among mothers, 38.22% were graduates and 28.45% postgraduates. The primary source of nutrition information for most students was family/parents (63.79%), followed by teachers/school (16.67%) and internet/social media (11.49%).

Table 1: Socio-demographic characteristics of participants (n=348)

[Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	207	59.48
	Female	141	40.52
Class	9th	90	25.86
	10th	104	29.89
	11th	90	25.86
	12th	64	18.39
Father's Education	Graduate	118	33.91
	Postgraduate	124	35.63
Mother's Education	Graduate	133	38.22
	Postgraduate	99	28.45
Primary Source of Information	Family/Parents	222	63.79
	Teachers/School	58	16.67
	Internet/Social Media	40	11.49

2. Nutrition Literacy Among Participants

The mean nutrition knowledge score was 12 ± 2.5 (range: 4–19 out of 23). Based on predefined cut-offs, the majority of participants demonstrated poor nutrition knowledge (72.13%), while 27.59% had fair knowledge, and only 0.29% exhibited good knowledge.

Table 2: Distribution of nutrition knowledge levels (n=348)

Knowledge Level	Frequency (n)	Percentage (%)
Good	1	0.29
Fair	96	27.59
Poor	251	72.13

3. Association of Nutrition Knowledge with Socio-Demographic Factors

When analyzed by gender, a slightly higher proportion of females (31.9%) had fair knowledge compared to males (24.64%), while poor knowledge was more prevalent among males (75.36%) than females (67.38%). However, this difference was not statistically significant (p=0.148).

A statistically significant association was observed between class and nutrition knowledge (p<0.001). Students in class 9 had the highest proportion of poor knowledge (90%), whereas relatively better knowledge levels were seen in classes 10 and 11.

No statistically significant association was found between nutrition knowledge and parental education (father: p=0.592; mother: p=0.301) or primary source of nutrition information (p=0.894).

Table 3: Association of nutrition knowledge with gender

Class	Good n (%)	Fair n (%)	Poor n (%)	p-value
9th	0	9 (10.0)	81 (90.0)	
10th	1 (0.96)	39 (37.50)	64 (61.54)	
11th	0	33 (36.67)	57 (63.33)	
12th	0	15 (23.44)	49 (76.56)	<0.001

Table 4: Association of nutrition knowledge with class

Class	Good n (%)	Fair n (%)	Poor n (%)	p-value
9th	0	9 (10.0)	81 (90.0)	
10th	1 (0.96)	39 (37.50)	64 (61.54)	
11th	0	33 (36.67)	57 (63.33)	
12th	0	15 (23.44)	49 (76.56)	<0.001

4. Dietary Habits and Practices

The majority of students followed a vegetarian diet (71.26%), with 21.84% ovo-vegetarian and 6.90% non-vegetarian. Most participants (58.91%) consumed 3–4 meals per day, while 34.20% reported only 1–2 meals daily.

Meal skipping was common, with 38.79% of students skipping meals 3–4 times per week and 11.49% skipping meals daily. Breakfast consumption was suboptimal, as 16.09% skipped breakfast daily and 28.74% skipped it multiple times per week. The most frequently cited reason for skipping meals was lack of appetite (38.79%), followed by time constraints.

Snacking between meals was reported by 61.78% of participants, with salty processed snacks (30.17%) being the most common choice, followed closely by fruits and vegetables (29.31%). Additionally, 61.78% of students reported purchasing food from school canteens or nearby vendors, with a significant proportion doing so regularly.

Table 5: Dietary habits and practices (n=348)

Variable	Category	Frequency (n)	Percentage (%)
Diet Type	Vegetarian	248	71.26
	Ovo-vegetarian	76	21.84
	Non-vegetarian	24	6.90
Meal Pattern	1–2 meals/day	119	34.20
	3–4 meals/day	205	58.91
Meal Skipping	Never	173	49.71
	3–4 times/week	135	38.79
	Daily	40	11.49
Breakfast Skipping	Never	192	55.17
	Daily	56	16.09
Snacking Habit	Yes	215	61.78
	No	133	38.22
Canteen Purchase	Yes	215	61.78
	No	133	38.22

5. Food Consumption Pattern (Food Frequency Analysis)

Daily consumption of staple foods such as cereals (36.49%) and milk (78.16%) was high. However, intake of nutritionally important foods was inconsistent. Only 20.69% consumed green leafy vegetables daily, and a notable proportion (8.62%) never consumed them. Protein-rich foods showed low consumption, with 68.10% never consuming eggs, 91.67% never consuming meat, and 94.25% never consuming fish.

Consumption of energy-dense foods was frequent. Junk foods such as pizza and burgers were consumed monthly by 33.33%, while cold drinks were consumed weekly by 27.01%. Snacks such as chips and fried foods were commonly consumed on a weekly basis.

Table 6: Selected food frequency pattern (n=348)

Food Item	Daily Consumption n (%)	Never n (%)
Cereals	127 (36.49)	3 (0.86)
Pulses	90 (25.86)	3 (0.86)
Fruits	160 (45.98)	1 (0.29)
Green Leafy Vegetables	72 (20.69)	30 (8.62)
Milk	272 (78.16)	8 (2.30)
Eggs	16 (4.60)	237 (68.10)
Meat	2 (0.57)	319 (91.67)
Fish	2 (0.57)	328 (94.25)

6. Evidence of Knowledge–Behavior Gap

Despite the presence of fair knowledge among a subset of students, unhealthy dietary practices were widely prevalent across the study population. High rates of snacking (61.78%), frequent consumption of processed foods, meal skipping, and canteen food purchases were observed alongside predominantly poor nutrition literacy levels.

This indicates a clear disconnect between nutrition knowledge and actual dietary behavior, suggesting that awareness alone does not translate into healthy eating practices among adolescents.

DISCUSSION

The present study highlights a substantial burden of poor nutrition literacy among adolescents, with more than two-thirds of participants demonstrating inadequate knowledge. This finding is consistent with previous Indian studies, which have reported suboptimal levels of nutrition awareness among school-going children despite increasing educational exposure.[8,9] Similar observations have also been reported in broader Indian contexts, where inadequate nutritional understanding continues to coexist with both undernutrition and emerging obesity trends among adolescents.[2,5]

A key finding of this study is the clear disconnect between nutrition knowledge and dietary practices. Despite some level of awareness among a subset of students, unhealthy dietary behaviors such as frequent snacking, meal skipping, and high consumption of processed foods were widely prevalent. This supports earlier findings that knowledge alone does not necessarily translate into behavior change.[3] Studies from urban India, including those conducted in Kolkata and Pune, have similarly reported frequent consumption of energy-dense foods, irregular meal patterns, and low intake of fruits and vegetables among adolescents.[10,11,13]

The prevalence of meal skipping and irregular dietary patterns observed in this study further reinforces the influence of behavioral and environmental factors over knowledge. Nearly half of the participants reported skipping meals regularly, with lack of appetite and time constraints being major reasons. Comparable findings have been reported in other Indian studies, where poor dietary habits were associated with irregular eating patterns and lifestyle-related factors rather than knowledge deficits alone.[13] This highlights the importance of considering psychosocial and environmental determinants while addressing adolescent nutrition.

Another important observation is the high prevalence of snacking and dependence on school canteens or nearby food vendors. More than half of the students reported purchasing food from external sources, indicating the significant role of the school food environment in shaping dietary behavior. Similar findings have been documented in studies from Karnataka and rural Maharashtra, where availability and accessibility of unhealthy foods within school settings influenced adolescents' food choices more strongly than their knowledge levels.[14,18] This emphasizes that interventions targeting only knowledge improvement may be insufficient without parallel modifications in the food environment.

The study also revealed low consumption of nutrient-rich foods such as green leafy vegetables and protein sources, along with high intake of processed and energy-dense foods. These findings are in line with national-level evidence indicating poor dietary diversity and widespread micronutrient deficiencies among Indian school children.[16,17] Limited intake of iron-rich and protein-rich foods during adolescence can have long-term consequences, including anemia and impaired growth, as highlighted in previous studies.[15]

The lack of significant association between nutrition knowledge and socio-demographic factors such as gender and parental education in this study suggests that higher educational background does not necessarily ensure better nutrition literacy or practices. Similar observations have been reported in international studies, where socio-economic and educational advantages did not always translate into healthier dietary behaviors.[20,21] This further supports the notion that knowledge is only one component of a complex behavioral framework.

Global evidence also corroborates the findings of the present study. Studies from China, Kuwait, and Turkey have demonstrated that while higher nutrition literacy is associated with better dietary behaviors, the relationship is not always consistent, and behavioral outcomes are influenced by multiple contextual factors.[19,20,22] Moreover, systematic reviews have emphasized that interventions focusing solely on information dissemination are less effective compared to those incorporating behavioral, environmental, and peer-led strategies.[24]

Overall, the findings of this study underscore the existence of a significant knowledge–behavior gap among adolescents. While improving nutrition literacy remains important, it is evident that knowledge alone is insufficient to drive sustainable dietary change. There is a pressing need for comprehensive, multi-component interventions that integrate nutrition education with behavioral modification strategies, supportive school environments, and active involvement of families and communities. Strengthening school-based health programs, regulating food environments, and promoting practical, skill-based nutrition education may help bridge this gap and improve adolescent health outcomes.

CONCLUSION

The present study reveals that a substantial proportion of school-going adolescents possess poor nutrition literacy, which coexists with widespread unhealthy dietary practices such as frequent snacking, meal skipping, and high consumption of processed foods. A key finding is the presence of a clear knowledge–behavior gap, where existing nutrition knowledge does not adequately translate into healthier dietary choices.

Despite a relatively favourable socio-demographic profile, including higher parental education levels, students demonstrated suboptimal dietary patterns and limited intake of nutrient-rich foods. This indicates that knowledge alone is insufficient to influence behavior, and that dietary practices are shaped by a complex interplay of environmental, behavioral, and social factors, including family influence and the school food environment.

The findings underscore the need for a shift from purely knowledge-based approaches to comprehensive, behavior-oriented interventions. School-based nutrition programs should go beyond theoretical education and incorporate practical, skill-based learning, behavior change communication, and supportive food environments. Regulation of school canteens, promotion of healthy food choices, and restriction of energy-dense, nutrient-poor foods are essential components of such strategies.

Furthermore, active involvement of parents, teachers, and community stakeholders is crucial to reinforce healthy behaviors both within and outside the school setting. Integration of national initiatives such as school health programs and nutrition campaigns can further strengthen these efforts.

In conclusion, addressing adolescent nutrition requires a multi-sectoral approach that bridges the gap between knowledge and practice, ensuring that awareness is effectively translated into sustainable healthy dietary behaviors, ultimately contributing to improved long-term health outcomes.

Recommendations:

- Implement behavior-focused nutrition education in schools
- Strengthen school food policies and canteen regulation
- Promote family and community engagement
- Integrate with national nutrition programs (e.g., school health initiatives)

Declarations

Ethical Approval: Permission was obtained from the school authority. Participation was voluntary and confidentiality was maintained.

Informed Consent: Assent was obtained from participants and permission from school authorities.

REFERENCES

1. Gutkowska K, Czarniecka-Skubina E, Górska-Warsewicz H, Hamulka J. Nutrition knowledge of primary schoolchildren in Poland from the parents' perspective based on qualitative studies. Sci Rep. 2025;15(1):17339.
2. Singh BP, Sharma M. Nutritional status of school going children in India: a review. Health Sci. 2021;10(10):130-8.
3. Naeeni MM, Jafari S, Fouladgar M, Heidari K, Farajzadegan Z, Fakhri M, et al. Nutritional knowledge, practice, and dietary habits among school children and adolescents. Int J Prev Med. 2014;5(Suppl 2):S171.
4. Locks LM, Shah M, Bhaise S, Hibberd PL, Patel A. Assessing the diets of young children and adolescents in India: challenges and opportunities. Front Pediatr. 2022;10:725812.
5. Nath S, Gahlot A, Sinha PK, Nath M. Assessment of nutritional status of children of age 5–14 years in covered rural area of private medical college, Kanpur. Indian J Forensic Community Med. 2019;6(3):163–9.
6. Gandhi PA, Venkatesh U, Tiwari P, Kishore J. An initiative to improve nutritional education among medical students. Med J Armed Forces India. 2021;77:S190–4.
7. Khiri N, Howells K. Nutritional education in medical curricula and clinical practice: a scoping review on the knowledge deficit amongst medical students and doctors. J Hum Nutr Diet. 2025;38(2):e70031.
8. Belwal E. Study on nutrition and health related practices of schools in association with nutritional status and knowledge of early adolescents in Dehradun district.
9. Belwal E, Kushwaha A, Srivastava S, Shukla AK. A valid and reliable nutrition knowledge questionnaire: an aid to assess the nutrition friendliness of schools of Dehradun, Uttarakhand. 2021.
10. Meher S, Nimonkar R. Assessment of dietary pattern of school going adolescents in a metro city: a cross sectional study. Int J Community Med Public Health. 2018;5(9):4043–8.
11. Mukherjee R, Chaturvedi S. A study of the dietary habits of school children in Pune city, Maharashtra, India. Int J Community Med Public Health. 2017;4(2):593–7.
12. Vaz RP, Acharya AS, Shrivastava S, Khandekar J. Awareness and use of nutrition information in food labels among school-going adolescents of East Delhi: a descriptive cross-sectional study. Indian J Med Spec. 2025;16(1):35–38.
13. Kumar S, Ray S, Roy D, Ganguly K, Dutta S, Mahapatra T, et al. Exercise and eating habits among urban adolescents: a cross-sectional study in Kolkata, India. BMC Public Health. 2017;17(1):468.
14. Banavali U, Patil S, Chavan R, Sonawane S, Joglekar C, Fall C, et al. What shapes adolescents' diet and physical activity habits in rural Konkan, India? Adolescents' and caregivers' perspectives. Public Health Nutr. 2021;24(16):5177–86.
15. Rokade N, Gore M, Jadhav S, Muley A. A cross-sectional study on anaemia related knowledge and dietary practices: insights from school-going adolescents in Mulshi Taluka, Pune, Maharashtra, India. J Clin Diagn Res. 2024;18(6).
16. Awasthi S, Kumar D, Mahdi AA, Agarwal GG, Pandey AK, Parveen H, et al. Prevalence of specific micronutrient deficiencies in urban school going children and adolescence of India: a multicenter cross-sectional study. PLoS One. 2022;17(5):e0267003.
17. Awasthi S, Kumar D, Dixit S, Mahdi AA, Gupta B, Agarwal GG, et al. Association of dietary intake with micronutrient deficiency in Indian school children: a cross-sectional study. J Nutr Sci. 2023;12:e104.
18. Jakkepally T, Doddihal CR, Patil SS. Assessing the school food environment in an urban area of North Karnataka. J Datta Meghe Inst Med Sci Univ. 2025;20(2):265–70.
19. Liu L, Ren X, Li W, Zhao S, Guo X, Yan R, et al. Nutritional literacy and health behaviors in primary school students in China: a cross-sectional study. BMC Public Health. 2025;25(1):1–12.
20. Zeng M, Zhu Y, Cai Z, Xian J, Li S, Wang T, et al. Nutrition literacy of middle school students and its influencing factors: a cross-sectional study in Chongqing, China. Front Public Health. 2022;10:807526.
21. AlBaloul AH, AlKhalidi MM, AlAjmi H. Nutrition literacy profile among adolescents in Kuwait: a cross-sectional study. Front Public Health. 2024;12:1453484.
22. Taleb S, Itani L. Nutrition literacy among adolescents and its association with eating habits and BMI in Tripoli, Lebanon. Diseases. 2021;9(2):25.
23. Kalkan I. The impact of nutrition literacy on the food habits among young adults in Turkey. Nutr Res Pract. 2019;13(4):352–7.
24. Ekubagewargies DT, Ahmed F, Lee P. Effectiveness of peer-led interventions in improving the dietary behavior of adolescents in low- and middle-income countries: a systematic review. Nutr Rev. 2025;83(7):1183–97.