ORIGINAL ARTICLE

Do food labels shape food choices? Insights from Medical Students of a medical college in Gujarat

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ABSTRACT

Background: Food labels are a simple yet powerful tool to guide healthier food choices. While awareness of labels is increasing, their consistent use remains limited, particularly among young adults who are at risk of adopting unhealthy dietary behaviours that contribute to non-communicable diseases (NCDs). **Objectives:** This study aimed to (1) Assess awareness regarding nutrition/food labels among medical students and (2) examine the impact of this awareness on their food and snack choices. **Methods:** A cross-sectional study was conducted among 172 MBBS randomly selected students (including late adolescents aged below 18 years and young adults) from a university medical college in Gujarat. Information was gathered through a pre-tested, validated questionnaire that explored how participants understood food labels, how they used them in daily life, and their snacking habits. Descriptive statistics and proportions were calculated using IBM SPSS 25. Ethical approval and informed consent were obtained. **Results:** Awareness of basic label components such as expiry date (100%), vegetarian/non-vegetarian logo (100%), and FSSAI mark (92%) was high. However, awareness of specialized logos like fortified food (49%) and Jaivik Bharat (23%) was limited. While 75% reported that reading labels influenced their food choices, only 17% regularly read them. Key barriers included lack of time (59%), reliance on brand trust (60%), and difficulty understanding labels (8%). Snacking was guided mainly by taste (66%) and brand (76%), with minimal influence from celebrity endorsements (11%). **Conclusion:** Although medical students demonstrated high awareness of food labels, regular and comprehensive label-reading practices were limited. The findings highlight a significant knowledge–practice gap, emphasizing the need for structured educational interventions and simplified labelling strategies to promote effective use of food labels and reduce long-term diet-related NCD risk.

KEYWORDS

Adolescents, Food choices, Food labelling, Medical students, Non-communicable diseases, Nutrition awareness

INTRODUCTION

Food labels represent one of the most direct and effective tools for guiding consumers towards healthier food choices. They comprise of information that provide details regarding ingredients, nutritional value, and food quality, and are governed globally by standards established by the Codex Alimentarius Commission under the Food and Agriculture Organization (FAO) and the World Health Organization (WHO).(1) The growing relevance of food labelling is highlighted by the escalating burden of non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancers, and chronic respiratory illnesses, which together account for nearly half of all years lived with disability and approximately one in five adolescent deaths worldwide.(2) In India, the Food Safety and Standards Authority of India (FSSAI) regulates the labelling of pre-packaged foods to ensure food safety, consumer protection, and transparency.(3)

The ability to correctly interpret food labels—including information on expiry dates, allergen warnings, storage instructions, nutrition facts, and health claims—empowers individuals to make informed dietary choices.(4) Recognizing this, policymakers globally advocate food label use as a simple, real-time strategy to encourage healthier eating behaviours.(5) This approach is particularly important in the context of unhealthy dietary patterns that contribute to obesity, hypertension, dyslipidaemia, and metabolic syndrome.(6) Young adulthood represents a critical life stage during which unhealthy dietary practices can predispose individuals to early onset obesity and diabetes.(7)

Despite the potential of food labels to mitigate these risks, adolescents often lack adequate knowledge, skills, or motivation to use label information effectively.(8) College students are an especially vulnerable group, as they commonly skip meals and rely heavily on processed foods.(9) Promoting food label literacy among this population therefore remains one of the most practical and cost-effective strategies to support healthier dietary behaviours.(10)

Medical students form an important group for studying food label awareness and use. As young adults, they are vulnerable to unhealthy eating habits that increase the risk of non-communicable diseases (NCDs). At the same time, as future healthcare providers, their personal nutrition practices and understanding of food labels can influence both their own long-term health and the dietary guidance they will provide to patients. Since food labels shape choices related to calories, fats, sugars, and sodium—key dietary determinants of NCDs—assessing their awareness and practices offers valuable insight into current risk behaviours and future preventive potential.

Aim & Objective(s)

- To study the awareness regarding nutrition/food labels among college-going medical students
- To study the impact of the awareness on the choices of food/snack made by them

MATERIAL & METHODS

A cross-sectional study was conducted through direct interviews to assess awareness of food labels and their influence on food/snack choices among MBBS students at a university medical college. In the absence of previously published food-label awareness studies among medical students in Gujarat or neighbouring states at the time of planning, prevalence data from an Indian adolescent population were used as the best available proxy for sample size estimation. Based on a study by Shah S. et al., where 70% of adolescents in Kolkata reported reading food labels, this prevalence was used to estimate sample size.(11)

Using the formula:

$$n = \frac{4 * P * Q}{L^2}$$

Where,

n = Sample size

P= Prévalence

Q= 100-P

L= Allowable error (taken as 10% of P)

n= 4 * 70 * 30/7 *7

n= 171.42 = 172 students

Participants were selected using simple random sampling. From each professional year (first to fourth), 43 students were chosen using roll numbers and a random number table.

A pre-designed and expert-validated questionnaire was developed with inputs from Public Health and Nutrition departments. It was pilot-tested on 20 MBBS students (data excluded from final analysis). Based on feedback, non-responsive items were modified or removed. The final questionnaire consisted of seven sections covering socio-demographic information, awareness of food and nutrition label components, types of labels, food and snack choices, label-use practices, snacking patterns, and overall label comprehension, in line with FSSAI guidelines.

Data were collected through in-person interviews after obtaining written informed consent. For participants under 18, assent was taken from guardians. Confidentiality and voluntary participation were emphasized, with an option to withdraw at any time. Data anonymity was maintained, and all records were secured by the principal investigator. Ethical clearance was obtained from the Institutional Ethics Committee. The study was conducted over two months (1st July to 31st August 2022), in accordance with ICMR guidelines for the STS project. Data were entered in MS Excel 2007 and analysed using IBM SPSS Statistics Version 25.0. Descriptive statistics and proportions were calculated.

Eligibility:

Inclusion criteria: MBBS students enrolled at the university who consented to participate.

Exclusion criteria: Students who did not provide consent

RESULTS

A total of 172 study participants pursuing MBBS programme were studied for assessing their awareness and practices related to food labels on food packets. The mean age was 20±1.55 years with 73% females and 27% males. About of 47% of study

participants had family history of Non communicable disease (NCD) like hypertension, diabetes, stroke, dyslipidaemia etc and 2% were not aware. Parental occupation was classified according to the Modified Kuppuswamys' Socioeconomic Scale (2021 revision). Based on this classification, fathers were predominantly engaged in service (50%) and business (37%), while most mothers were homemakers (67%), followed by service (28%). Whereas the assessment of mothers' occupation showed, nearly 67% were housewives, 3% belonged to business class, 28% in service and less than 1% belonged to health worker and nearly the same number were managers.

Graph 1: Awareness about the presence and functionality of the regulatory body FSSAI (n=172)

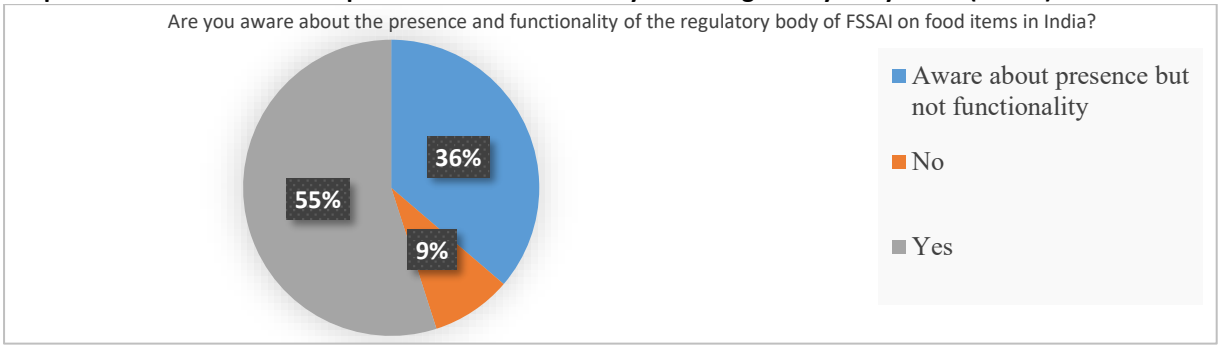
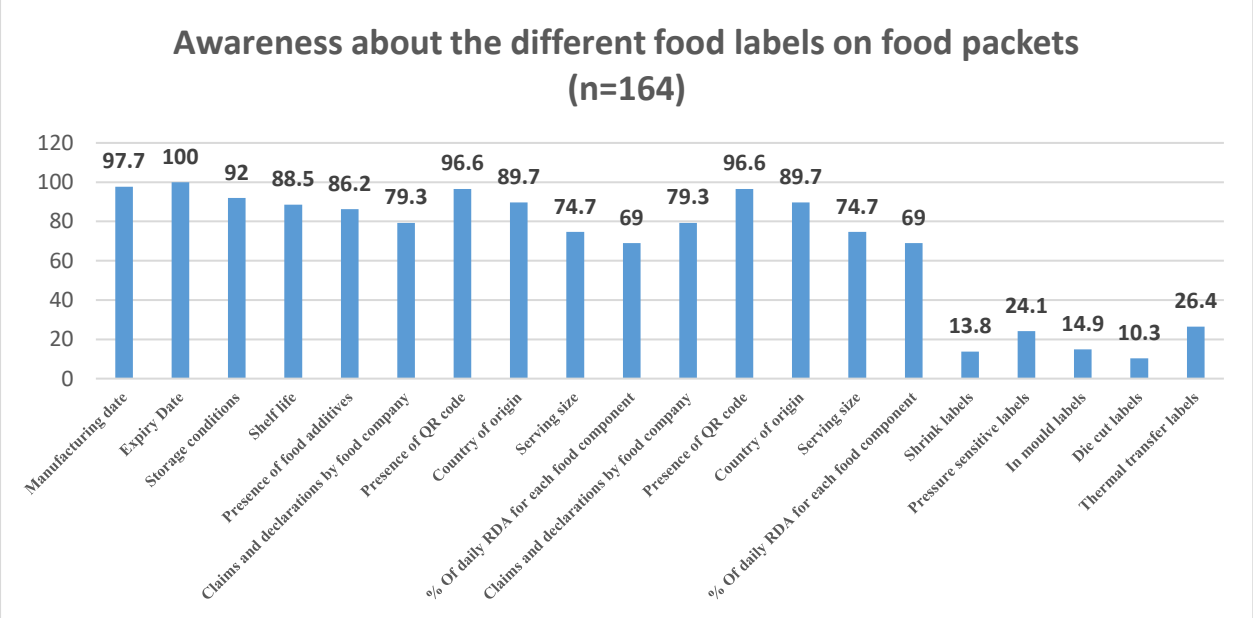


Figure 1 depicts that when asked about the functionality of FSSAI as a regulatory authority, nearly 9% of the participants were not aware about its presence and functionality both. It can also be seen from the table that about 36% were aware about the presence but not aware about its functionality. Majority of the participants (55%) however, were aware about the presence of the regulatory body and about its functionality with respect to food labels. Nearly all the students were aware about the presence of food labels on food packets.

Graph 2:Awareness about the different food labels on food packets (n=164):



The students were then asked about the various components of food labels on food packets. This is shown in **Figure 2**. The study found that nearly all participants (98%) were aware of the manufacturing date, and all were aware of the expiry date. Awareness of storage conditions was high (92%), with 8% unaware. Approximately 89% knew about shelf life, while 12% did not. Awareness of food additives was reported by 86% of participants, and 79% were aware of claims and declarations on food packets. Awareness of QR codes (97%) and country-of-origin labels (90%) was also high. Regarding other label components, 75% were aware of serving size, and 69% understood the % of daily RDA. Most participants recognized the FSSAI logo (92%) and vegetarian/non-

vegetarian logos (100%). Awareness of the ISI mark stood at 91%, while AGMARK recognition was lower (59%). Awareness of the fortified food logo was nearly evenly split (49% aware, 51% unaware). Recyclable symbols were recognized by 82% of participants, while fewer were aware of specific logos: 23% knew the Jaivik Bharat logo, 14% the shrink label, 24% pressure-sensitive labels, 15% in-mould labels, 10% die-cut labels, and 26% thermal transfer labels. The rest were largely unaware of these label types. 76% of study participants looked consciously for a popular brand in a food item and Nestle was the most preferred brand followed by Balaji and Amul. About 11% of study participants chose a food product which was endorsed by a popular celebrity.

The study revealed variability in the reading practices of food labels among participants. Most read the expiry date (98%) and manufacturing date (92%). However, reading practices declined for other information: 65% read storage conditions, 56% shelf life, and 48% food additives. Only 35% reviewed claims/declarations, 56% checked QR codes, and 59% read country-of-origin labels. Serving size was read by 50%, while only 30% read the % of daily RDA. Regarding logos, 62% checked the FSSAI logo, and 97% read vegetarian/non-vegetarian symbols. ISI mark reading was reported by 58%, AGMARK by 31%, and fortified food logos by just 17%. About 48% read the recyclable sign, while only 7% read the Jaivik Bharat logo. Nutritional information reading varied: 55% read total fat, 35% saturated fat, 31% unsaturated fat, and 51% cholesterol. Only 26% read sodium content, while 66% checked total calories. Dietary fibre was read by 27%, sugar by 48%, trans-fat by 33%, and protein by 53%. Awareness levels were generally high, though actual reading practices showed significant gaps for many label components.

Table No. 1: Snacking pattern among the study participants (n=172)

Frequency of snacking		
Response	Frequency	%
>4 times a day	13	7.6
1-2 times a day	118	69.1
2-4 times a day	40	23.3
Total	**172**	**100.0**
Time of consumption*		
Response	Frequency	%
After lecture gets over	93	54.2
After recreational activity	42	24.4
During breaks	107	62.6
Who decides nature of snack*		
Response	Frequency	%
Self	164	95.4
Peers	23	13.7
When do you ignore reading labels*		
Response	Frequency	%
Lack of time	101	58.8
Trust on brand	102	59.5
Unable to understand	13	7.6
Reason for snacking		
Response	Frequency	%
Easily available	84	48.9
They are tasty	112	65.6
Bored	27	16.0
Activity when snacking is common*		
Response	Frequency	%
Watching TV	102	59.5
Studying	55	32.1
Going out with friends	81	46.9

** Multiple response variable*

The participants were also evaluated for their snacking pattern as shown in **Table No. 1**. This revealed that, 8% of study participants reported snacking more than four times a day, while 69% snacked 1–2 times daily, and 23% snacked 2–4 times a day. About 54% consumed snacks after lectures, 24% after recreational activities, and 63% during breaks during ongoing academic sessions.

For 95% of participants, snack choices were self-determined, whereas 14% were influenced by peers. "Taste" was the primary reason for snacking among 66%, followed by availability (49%) and boredom (16%). Regarding snacking habits, 60% snacked while watching TV, 47% while going out with friends, and 32% while studying. Label reading was ignored by 59% due to lack of time, 60% due to trust in the brand, and 8% due to difficulty in understanding the labels.

Table No. 2: Practices and Level of understanding of the food labels(n=172)

How regularly do you read labels before choosing a food item		
Response	Frequency	%
Always	28	16.5
Never	4	2.2
Sometimes	140	81.3
Total	**172**	**100**
Is the information understandable		
Response	Frequency	%
Easy	151.0	87.8
Hard	21.0	12.2
Total	**172**	**100**
Quantity of information on food labels		
Response	Frequency	%
Sufficient	122	71.0
Insufficient	50	29.0
Total	**172**	**100**
Impact on decision to buy food products		
Response	Frequency	%
No effect	43	25.3
Positive	129	74.7
Total	**172**	**100**
How much important do you consider reading food labels		
Response	Frequency	%
Very important	145	84.4
Barely important	27	15.6
Total	**172**	**100**
Reason for reading food labels		
Response	Frequency	%
Know about nutritive value	111	64.5
Curious	61	35.5
Do you think that food labels help to make rational choice of food?		
Response	Frequency	%
No	15	8.8
Yes	157	91.2
Total	**172**	**100**

Table No. 2 depicts practices and levels of understanding related to food labels along with the impact it carries on choice of food packets among study participants. The table shows that 17% of study participants regularly read food labels, 81% read them occasionally, and 2% never do. About 88% found food labels easy to understand, while 12% found them difficult. Approximately 71% felt the information was sufficient, whereas 29% found it lacking. Reading food labels positively influenced purchasing decisions for 75% of participants, indicating a 3:4 ratio in favor of informed choices, while 25% reported no impact. Additionally, 84% considered reading labels very important, and 16% viewed it as barely important. Around 65% read labels to understand nutritional value, while 35% did so out of curiosity. Lastly, 91% believed food labels help in making rational food choices, compared to 9% who did not.

DISCUSSION

This study assessed awareness and use of food labels among medical students and explored their influence on dietary choices. The primary outcome showed that although awareness of food labels was high, only a minority regularly read them, and key nutritional details such as sodium and trans-fat

were often overlooked. A secondary outcome indicated that three-fourths of students felt labels influenced their choices, yet barriers such as time constraints, brand trust, and difficulty in interpretation limited consistent use. These findings align with prior reports that awareness does not always translate into practice, underscoring the knowledge–practice gap in nutrition-related behaviours.(12–13, 19–20)

A strength of this study is its focus on medical students, a group with both personal health risks and professional responsibility as future health advocates. The cross-sectional design and validated questionnaire enabled systematic data collection; however, limitations include reliance on self-reported practices, lack of objective dietary assessment, and restriction to a single institution, which may limit generalizability.

In the context of existing evidence, our results reinforce WHO and FAO perspectives that clear labelling can support healthier eating and mitigate NCD risk.(12,14,17) The FSSAI's regulatory framework provides a strong foundation, but barriers identified in this study highlight the need for strategies beyond regulation—such as simplified front-of-pack labels, targeted education, and integration of label literacy into medical curricula.(15,18) This study adds to evidence that while food labels are a potentially powerful tool, they must be paired with behavioural interventions to shift actual consumption patterns.

Controversies remain regarding the relative influence of labels compared with aggressive food marketing and celebrity endorsements, which continue to shape youth choices.(21) A possible mechanism for low engagement with labels may be cognitive overload—students prioritizing brand familiarity and convenience over detailed nutrition information.

Future research should expand to multi-institutional cohorts, include longitudinal follow-up to assess behaviour change, and explore innovative interventions (e.g., digital nutrition apps, simplified interpretive labels). Clinical and public health research could also test whether improved label literacy among medical students translates into healthier personal behaviours and enhanced patient counselling.

In summary, this study highlights the gap between awareness and practice in food label use among medical students, reinforcing the need for education-driven and system-level approaches to maximize the public health benefits of food labelling.(13–22)

CONCLUSION

This study shows that while medical students are generally aware of food labels, consistent and meaningful use of this information remains limited. Many participants valued labels but often overlooked critical details such as sodium, fat, and trans-fat content—primarily due to time pressure, reliance on brand reputation, or difficulty interpreting information. As future healthcare providers, medical students must not only adopt healthier food practices themselves but also be prepared to guide patients toward informed dietary decisions. Strengthening label literacy, supported by clearer standards and public health initiatives, could help bridge the knowledge–practice gap and contribute to reducing the burden of diet-related noncommunicable diseases.

RECOMMENDATION

The findings of this study underscore the need for multifaceted strategies to strengthen the role of food labelling in public health. Regulatory frameworks must be reinforced to ensure that food labels provide accurate and trustworthy information, particularly on nutrients of concern such as sugars, fats, and sodium. At the same time, awareness-building initiatives in schools, colleges, and universities are essential to equip young people—especially medical students—with the skills to interpret labels effectively and make healthier dietary choices. Integrating food label literacy into the medical curriculum would not only benefit students' personal health but also enhance their capacity to guide future patients. Making user-friendly resources widely accessible and coupling labelling efforts with broader health promotion, including responsible media messaging and celebrity-driven campaigns, can help normalize informed eating. Such efforts are critical in reducing the knowledge–practice gap observed in this study and in promoting healthier behaviours among youth, thereby contributing to long-term prevention of diet-related noncommunicable diseases.

LIMITATION OF THE STUDY

This study was conducted in a single medical college, which may limit the generalizability of the findings to students in other regions or disciplines. Data were self-reported, making them subject to recall and social desirability bias. Despite these limitations, the study provides valuable insights into the awareness–practice gap in food label use among young adults.

RELEVANCE OF THE STUDY

Existing literature highlights that while awareness of food labels is increasing globally, their consistent use in guiding healthier dietary practices remains suboptimal, particularly among adolescents and young adults.(12–14, 19–20) Prior studies have shown that young people often prioritize convenience, taste, or brand loyalty over nutritional information, leading to a knowledge–practice gap.(17, 21) Present study reinforces these observations in the Indian context, where medical students—despite their training background and high awareness—display similar behavioural patterns. This adds to the evidence that awareness alone is insufficient without structured education and user-friendly labelling systems. Importantly, by focusing on medical students, this study contributes novel insights into a group that not only faces personal health risks but will also influence public attitudes and patient counselling in the future. In doing so, it bridges a critical gap in the literature and underscores the need for integrating food label literacy into both public health strategies and medical education.

Authors Contribution

All authors have contributed equally.

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Conflict of Interest

NIL

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Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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