Global Journal of Medicine & Public Health

Knowledge, attitude and practices regarding food labeling among Medical & Nursing students in a medical college in Madhya Pradesh, India: A cross-sectional study

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ABSTRACT

Background

Considering college students' food consumption habits and the importance of consumers' comprehension and awareness of food labels in healthy food choices, our study primarily aims to assess the knowledge, attitude and practices (KAP) about food labelling among medical & nursing students and also to compare the KAP between them.

Methods and Material

A cross-sectional study was conducted among medical and nursing students of Government Bundelkhand Medical College, Sagar through a semi-structured, pretested and self-administered questionnaire. Students' general information, knowledge, attitude, practices and reasons for using and not using food labels were collected. We assessed knowledge with the mean score, while attitudes and behaviours with a five-point Likert scale. *SPSS* version 26 was used for data analysis. Qualitative data were presented as frequency and percentage, whereas, quantitative data were presented as mean (SD). The chi-square test and Mann-Whitney U test was applied to examine the differences across groups.

Results

A total of 100 medical and nursing students, 50 each was participated with a mean age was 19.95±1.37. Among the medical students, 58% (29/50) and 40% (20/50) of nursing students had good knowledge about food labelling. The difference of knowledge across the group was not statistically significant. Even some students agreed that food labelling is an essential tool for consumers, the majority disagreed that nutritional information helps them buy food. Medical and nursing students' food labelling practices differed significantly. Medical and nursing students listed "reading food label time demanding" and "non-attractive food label" as the top reasons for not using food labels.

Conclusions

Medical and nursing students had favourable opinions about food labels but low knowledge and improper utilization. Thus, food labelling awareness initiatives are needed more than ever.

Key-words: Food labelling, knowledge, attitudes, practice, medical students, nursing students

GJMEDPH 2022; Vol. 11, issue 5 | OPEN ACCESS

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Conflict of Interest—none | **Funding—**none

INTRODUCTION

The World Health Organization's Global Strategy on diet, physical activity, and health advises the food sector to give consumers simple, clear, and consistent food labels and evidence-based nutrition information that will assist consumers in making well-informed decisions and choices that are healthy.[1] Simply regulating food labelling procedures without also analyzing consumer awareness of healthy food choices and labelling would be a waste of time. Labelling is a key method for assisting the public in making informed food choices. The major goal of food labelling is to provide accurate information about the nutrient composition of foods. Reduced consumption of nutrients of concern would likely make a significant contribution to decreasing the burden of obesity and diet-related disease at both a national and global level by improving the healthiness of packaged foods and beverages. Nutrient profiling is the science of classifying or ranking foods and beverages based on their nutritional content for disease prevention and health promotion and it gives a way to assess the healthiness of foods and beverages.[2] Non-communicable illnesses including diabetes, hypertension, and heart problems are becoming more common worldwide.[3] Unhealthy eating habits, such as increased consumption of packaged and processed foods is one of the main risk factors for non-communicable diseases.[4] As a result, it is critical for consumers to be able to read and understand food labels in order to make safe and healthy decisions. A few studies have shown that although most consumers have a good knowledge and attitude toward food labels, they do not utilize food labels often.[5]

Since college students are often away from home and making more decisions about their diets than ever before, therefore they represent an appropriate group to study. Food consumption patterns of college students are of concern because students tend to skip meals, eat diets excessively high in fat and refined sugars, and avoid certain types of nutritious foods.[6] Undergraduate medical and nursing students should be well-versed on healthy eating, food labels, and how to use them properly because they will be the future of our healthcare. With their proper understanding, they will be able to counsel their future patients on how to properly use food labels and so serve as change agents in the neighborhood. Their ability to lead a healthy life will also be aided by the proper use of food labels.

Considering the significant role of consumers' understanding and awareness about food labels in making healthy food choices and the limited studies available which included medical and nursing students, the present study examined the knowledge, attitude and practices (KAP) about food labelling among medical & nursing students at a medical college as an educated group of community and also compared the KAP between them.

MATERIALS AND METHODS

Study Design, Period, and Setting

This was a cross-sectional study conducted in November to December 2021 among medical and nursing students of Government Bundelkhand Medical College, Sagar, Madhya Pradesh.

Sample Size and Sampling

The sample size was calculated by using formula[7], $N = (Z^2.p.q)/d^2$, where p= 40 (assuming that 40% of the students have a good awareness about food labeling in India[8]) and d = 10%. At 95% confidence level, which comes around 92.2, and rounded off to 100. We sampled the required students by stratified random sampling technique.

The first year medical and nursing students were included, while those who were not willing to participate and had not given informed consent for the study were excluded. Out of 125 first-year medical and 100 first-year nursing students, participants were selected randomly by OpenEpi[9] random number generator from each group till the desired sample size were reached.

Data Collection

Data was collected through a semi-structured pretested questionnaire, which contains questions related to general information of students, questions about knowledge, attitude,

practices regarding food labelling and reasons for usage and non-usage of food labels. After data collection, awareness session was organized to educate & counsel them regarding food labelling, its benefits and how to use them.

Data Processing and Analysis

Data entry was done in *MS Excel* and analysis was done using *SPSS 26*. We computed scores of knowledges by adding individual responses to the questions. Based on the mean score, wecategorized people as having good and poor knowledge. Attitude and practices related to food labels were measured with a five-point Likert scale. For qualitative data, results were presented as frequency and percentage. The chi-square test and Mann-Whitney U test was applied to examine the differences across groups. P-values less than 0.05 were considered as significant.

Ethical Consideration

The study was approved by the Institutional Ethics Committee of Govt Bundelkhand Medical College, Sagar (Approval letter no-IECBMC/2021/58, dated-12/11/2021). Informed consent was obtained from all the students to participate in the study and all personal identifying information related to the students were kept confidential. The digital data were saved in password-protected files, and only the researchers had access to the data

Results

In this study, 100 students participated out of which 50 were medical students and 50 were nursing students. The mean age was 19.95±1.37, where the maximum age was 24 and the minimum age was 18 years. Among the medical students 28 were male and 22 were female whereas in nursing students all 50 students were females. All the nursing and medical students were unmarried.

Knowledge about food labelling

In our study we found that, among the medical students, 58% (29/50) and 40% (20/50) of nursing students had good knowledge about food labelling. The difference of knowledge across the group was not statistically significant. (Table. 1) Among the students who knew about food labelling majority of medical and nursing students cited multimedia as their source of knowledge followed by the internet and others about food labelling.

Table.1: Knowledge about food labelling across branch (N=100)

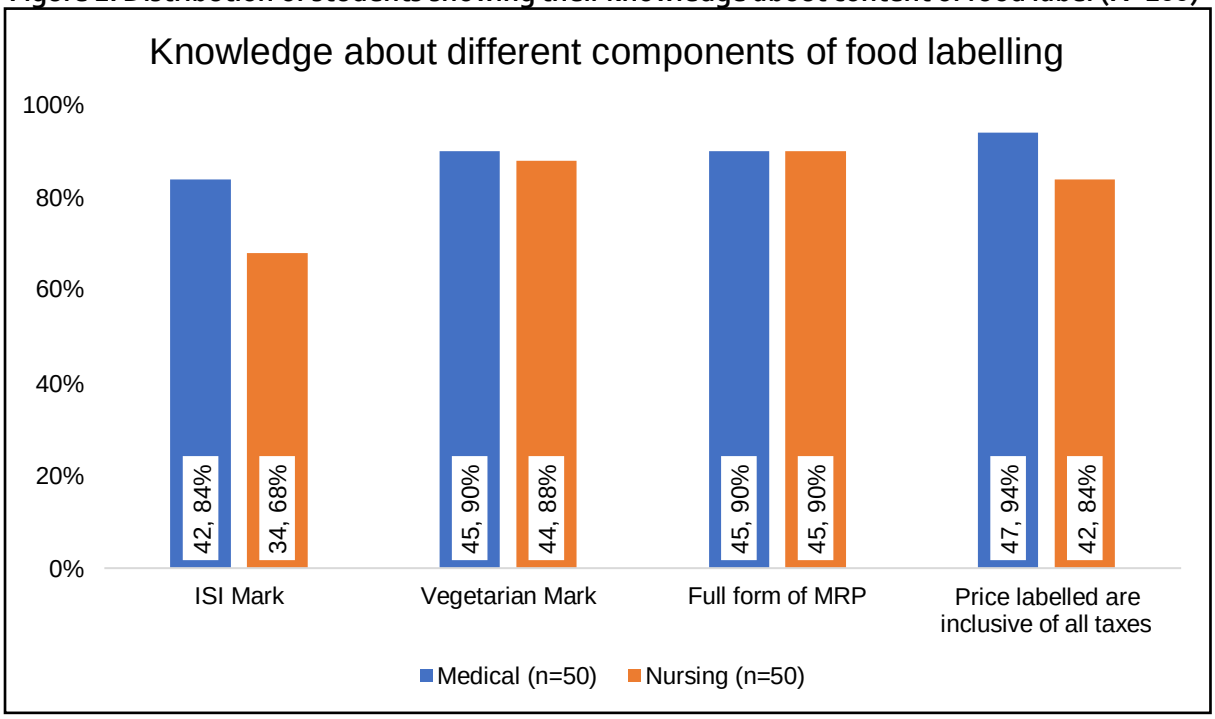
Knowledge	Student		Total	p-value
	Medical	Nursing		
Good	29 (58%)	20 (40%)	49 (49%)	0.072
Poor	21 (42%)	30 (60%)	51 (51%)	
Total	50	50	100	

(Table. 2) Majority of the medical and nursing students knew about the different content of food labelling, however only 84% of medical students and 68% of nursing students know about ISI mark. (Fig.1)

Table 2: Source of knowledge about food labelling

Source (multiple responses)	Medical (n=29)	Nursing (n=20)
Multimedia (News, TV advertisements)	16 (55%)	17 (85%)
Internet	7 (24%)	8 (40%)
Friends	13 (45%)	14 (70%)
Family members	5 (17%)	3 (15%)
Doctors	5 (17%)	4 (20%)
Awareness programmes	2 (7%)	3 (15%)
Others	2 (7%)	4 (20%)

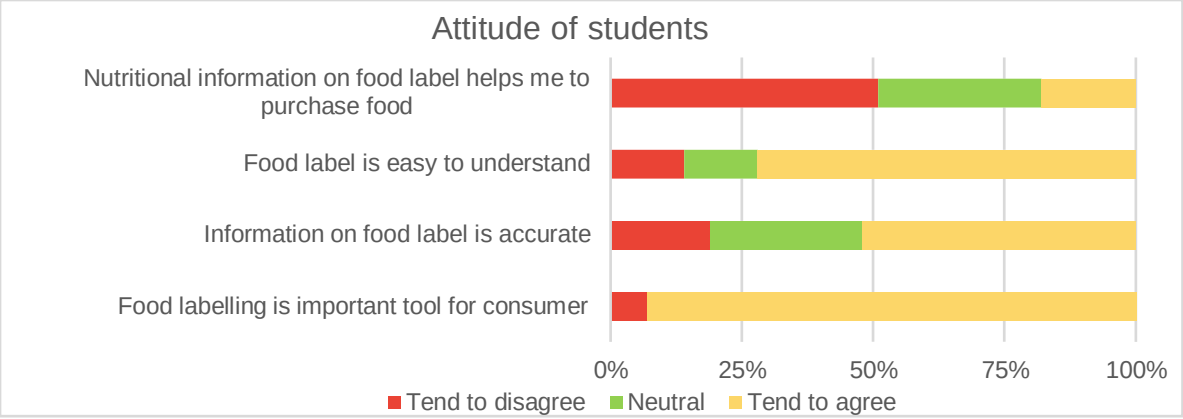
Figure 1: Distribution of students showing their knowledge about content of food label (N=100)



Attitude of students regarding food labelling

Even though students agreed to the fact that food labelling is an important tool for consumers, the majority disagreed that nutritional information on food labels helps them to purchase food. We performed the Mann-Whitney U test to measure differences in the distribution of responses between medical & nursing students and found significantly different response ($p<0.05$) for 'information on food label is accurate' & 'nutritional information on food label helps me to purchase food'.

Figure 2: Attitude of students (medical & nursing) regarding food labelling (N=100)



Practices among students regarding food labelling

Practices among students regarding food labelling varied across the medical and nursing students and those differences in practices of food labelling usages between medical and nursing students were found to be statistically significant. (Table. 3)

Table 3: Practices among students regarding food labelling

Practices	Often	Always	Sometimes	Rarely	Never	p-value#
Read food label						
Medical (N=50)	6 (12%)	20 (40%)	18 (36%)	4 (8%)	2 (4%)	0.154
Nursing (N=50)	12 (24%)	15 (30%)	15(30%)	4(8%)	4(8%)	
Read manufacturing & expiry date						
Medical (N=50)	3 (6%)	40 (80%)	5 (10%)	1 (2%)	1 (2%)	0.005*
Nursing (N=50)	6 (32%)	36 (72%)	2(4%)	4(8%)	2(4%)	
Read storage condition						
Medical (N=50)	3(6%)	23 (36%)	20 (40%)	2(4%)	2(4%)	0.017*
Nursing (N=50)	9 (18%)	19 (38%)	10 (20%)	10 (20%)	2(4%)	
Calculate calorie intake before purchasing						
Medical (N=50)	16 (32%)	5(10%)	1 (2%)	16 (32%)	14 (28%)	0.004*
Nursing (N=50)	15(30%)	3(6%)	3(6%)	8 (16%)	19 (38%)	
Avoid any packaged food if no food label is there						
Medical (N=50)	7(14%)	24 (48%)	10(20%)	5(10%)	4(8%)	0.036*
Nursing (N=50)	9 (18%)	25 (50%)	8 (16%)	5(10%)	3(6%)	
Choose product based on food label						
Medical (N=50)	17 (34%)	22(44%)	6 (12%)	3(6%)	2 (4%)	0.009*
Nursing (N=50)	4(8%)	16(32%)	12 (24%)	15(30%)	3(6%)	

#Mann- Whitney U test, *Statistically significant (<0.05).

Maximum of medical and nursing students cited 'reading food label time consuming' as the main reason for non-usage of food labels followed by 'non-attractive food label'. While 'to make healthy choices' was the main reason for using the food label. (Fig.3 & Fig.4)

Figure 3: Distribution of reasons for non-usage of food labels among students (multiple responses) (N=100)

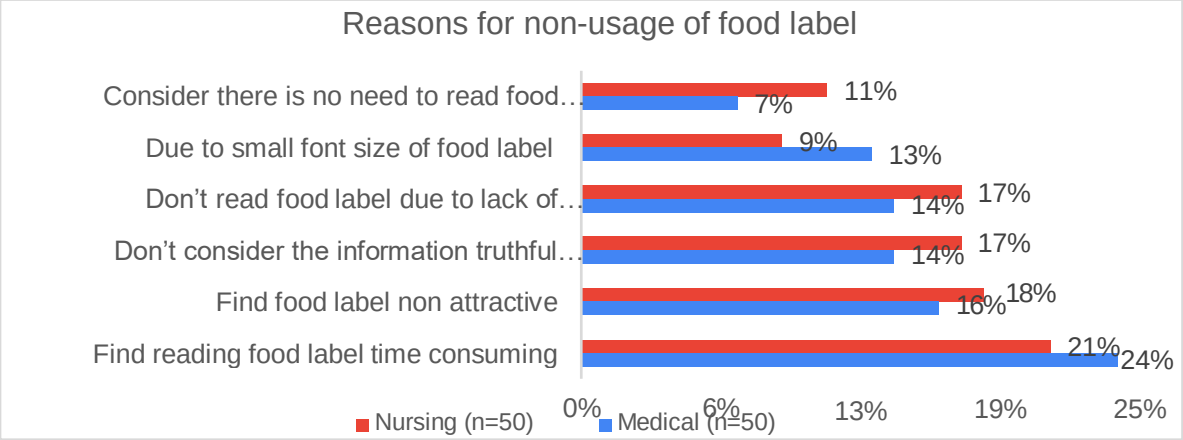
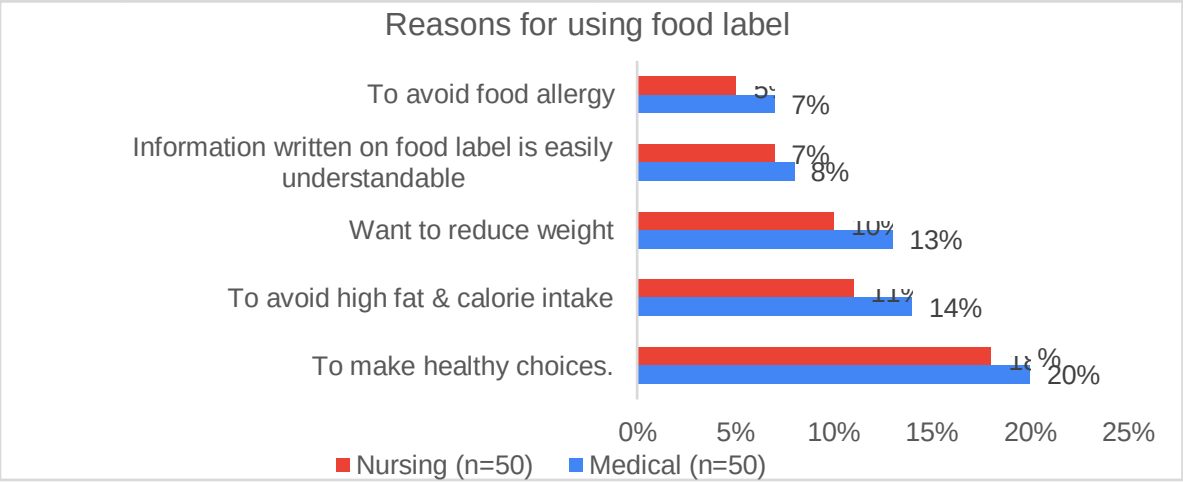


Figure 4: Distribution of reasons for usage of food labels (multiple responses) (N=100)



DISCUSSION

This cross-sectional study was conducted to assess the knowledge, perception and practices of medical and nursing students about food labelling. Our study showed that 58% of medical students and 40% of nursing students had good knowledge about food labelling. They were familiar with the contents of food labelling and the medical students in this study had a sound knowledge about food labelling. Previous research among college students have found that both knowledge and use of food labels are high, with medical students having greater levels of knowledge than nonmedical students. A study by Aida Malek Mahdavi et al. found that 89.2% of students believed food labels affected their nutritional awareness.[10] According to their study 77.4% of students, food labels are helpful, 79.2% believe nutrition claims on food labels are not accurate, and for 84% of students, expiry date and storage conditions information are important information.[10] Riaz F et al. also reported overall 76.3% of students knew food labelling and significant differences were observed between medical, nursing and dentistry students, which is similar to our study results.[11]

Most students in this study had positive attitudes towards food labelling. However, despite having positive attitudes, very few utilize the food labels adequately except the majority going through the manufacturing & expiry date of the product. A similar practice was also reported by Annamalai S and Gopichandran V. in their study which was conducted among medical students.[5]

They reported that the most frequently examined item on the food label was the expiry date, with more than 75% viewing it always. But a weighted average calculation by Mary J Christoph et al showed 36·5 % of college students and young adults reported using labels always or often.[12] The practice of food labelling was also better among medical students compared to nursing students.[5] Based on the findings of study done by Neda Dolatkhah et al., 41.2% of the participants, i.e., medical students always read food labels when purchasing foods and the most common reason for non-using food labels included lack of time to read the food labels.[13] Hanoon Y et al also observed time-consuming as the main barrier stated by the students.[14] Our study also reported a similar finding regarding the practice. Hence pictography and colour coding are better time management practices.

A cross-sectional survey done among 1000 undergraduate and 500 graduate students showed approximately half (55%) of students had never read, heard, or been taught information about how to use food labels and 44% reported the use of nutritional supplements in their daily diet.[15] Mary J. Christoph and Ruopeng An also concludes that "Nutrition labels had a moderate but positive effect on dietary intake of college students."[16] An association between prior nutrition education, attitude, and label reading behaviour was found in other studies.[15] The poor practice of the utilization of food labelling may be due to the fact that the knowledge regarding food labelling is poor among the students.The source of their knowledge was multimedia and the internet to a great extent. Dario Gregori et al also concur with this study that "Advertising was considered as the most efficient tool to gather nutrition information."[17] However, very few knew it from awareness programmes.

LIMITATIONS

The study was conducted in one medical college in Madhya Pradesh, and therefore, the findings are not representative of all medical and nursing students. The sample size is relatively small, and therefore, it is likely that the estimates are underpowered. There is a possibility of a socially desirable response in answering practice and attitude questions related to food labelling. However, despite these limitations, the study provides valuable information on levels of utilization of food labels among medical and nursing students.

CONCLUSION

Medical and nursing students exhibited positive attitudes regarding food labels, but they lacked adequate knowledge of food labelling and food label utilization patterns were poor. As a result, there is a greater need for public health awareness campaigns and curricular changes that emphasize the importance of food labelling. To encourage better food label usage behaviour among future healthcare professionals, educational programs on food labelling are recommended.

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