ORIGINAL ARTICLE

Knowledge, attitude, and practice of using food labels among medical students: A cross-sectional study in Haiphong, Vietnam

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ABSTRACT

Food labeling is an essential tool that provides consumers with dietary guidelines. The increased use of food labels can improve people's health and prevent nutrition-related problems. In Vietnam, more evidence is needed regarding the practice of reading of food labels, particularly among medical students. A cross-sectional study was conducted using a self-administered structured questionnaire from January 25 to February 30, 2022, on 1,120 medical students at Haiphong University of Medicine and Pharmacy in Vietnam. The study revealed that only about 20% of respondents understood the information on ingredients, nutritional facts, and allergens. 99.1% of respondents believed that food labels are helpful for consumers. 80% of respondents considered reading food labels necessary or very necessary. Only 2.9% strongly believed, and 33.8% believed in food labels. When purchasing foods, the percentage of respondents who often and always read food labels was 23% and 7.5%, respectively. Nearly 80% of respondents often or always prioritize buying food with labels. In addition, the price was the most critical factor in product choice for 78.7% of respondents. Multivariate logistic regression analysis showed that type of residence and nutrition knowledge were associated with reading food labels. Few Vietnamese medical students read food labels despite considering it necessary. Medical training programs should emphasize the importance of reading food labels for future doctors to improve the population's health.

Key words:
knowledge; attitude; practice; food labels; Vietnam

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INTRODUCTION

Non-communicable diseases (NCDs) are a public health issue, contributing significantly to the worldwide disease burden.[1] According to the World Health Organization (WHO), NCDs cause 41 million deaths yearly, accounting for 74% of all deaths worldwide.[2] Vietnam is experiencing an increased burden of NCDs due to rapid economic growth and urbanization.[3] Previous reports have indicated that NCDs account for 77% of deaths in Vietnam, the most common NCDs being cardiovascular disease, cancer, and diabetes.[3]

University students have a significant prevalence and co-occurrence of behavioral risk factors for NCDs. Research on 18,017 university students from 24 countries in Africa, the Americas, and Asia indicated that the prevalence of single behavioral NCD risk indicators was 38.2% for physical inactivity, 80.5% for inadequate fruit and vegetable intake, 23.1% for being overweight/obesity, 10.5% for heavy alcohol use, and 11.8% for current tobacco use. Additionally, 15.9% of students had three or more behavioral NCD risk factors, while the average number was 1.6.[4]

Unhealthy food choices are one of the contributing factors leading to an increased risk of several nutrition-related NCDs. To help communities make healthier food choices, WHO recommends using food labels.[5] Reading the information on food labels is essential to help consumers make informed decisions about healthy food choices. Food labels are the primary tool to provide consumers with nutritional information.[6] Nutritional knowledge is crucial in assisting customers with informed food purchases.[7] The U.S. Food and Drug Administration (FDA) has found that half of the annual spending of consumers is on packaged foods, and one-third of total calorie intake comes from packaged foods. Despite the importance of food labels in providing nutritional information, many people either do not understand or underestimate the calorie and nutrient content of their food. Educating and instructing consumers to read food labels can help them make healthy and informed choices.[8] Research has shown that reading and understanding nutritional information on food packaging can help individuals develop healthy eating habits. Miller et al. found that individuals who read food labels tended to have healthier diets.[9] Several studies conducted in high-income countries have shown a significant correlation between the use of nutrition labels and individual serving sizes.[10, 11] Studies have shown that food label use is associated with higher consumption of fiber and iron,[12] lower energy intake from fat, carbohydrates, and sodium, and significantly reduced energy intake from added sugars.[13]

Despite the benefits of food labels, consumers often ignore them. For instance, research conducted at a rural university in South Africa in 2019 found that 61% of students had little understanding of the contents of food labels.[14] Al-Barqi et al. conducted research on 572 female students at an Arab medical college in 2020 and found that 17.7% of study participants never read food labels, whereas 16.8% rarely read food labels. Only around 10% of participants reported always reading and considering food labels. According to a survey, about 41.0% of the participants indicated that time constraints were the main barrier to not using food labels, followed by no interest (31.3%), no need (27.8%), and difficulty in using them (24.8%).[15] Research conducted on 365 students of Universitas Nusa Cendana in Indonesia showed that 63.6% of respondents had good knowledge of food labels, 71.7% had a good attitude toward

reading them, and 65.8% had poor behavior toward reading them.[16]

The results from a systematic review found that no matter the nation, the environment, or the medical school year, nutrition needs to be sufficiently taught in medical school. A lack of nutrition education impacts students' understanding, competency, and confidence in integrating nutrition care into clinical practice.[17] Medical students are expected to advise patients and the population on health behavior. However, according to our findings, there is limited evidence about the knowledge, attitude, and practice (KAP) of reading food labels among Vietnamese medical students. Moreover, at the Haiphong University of Medicine and Pharmacy, where this study was conducted, food labels are not currently included in the curriculum for medical students majoring in general medicine. Therefore, this study's findings will provide valuable information to the university, helping them decide whether it is relevant and necessary to train future health professionals to read food labels.

METHODS

Study participant and study site

The medical students were studying at Haiphong University of Medicine and Pharmacy, Vietnam, in 2022. The university is located in Haiphong City, one of the major cities in northern Vietnam. The inclusion criterion was first-year to sixth-year students majoring in general medicine. The exclusion criterion was participants who disagreed to get involved in the study.

Study design and sample size

The sample size was calculated based on the formula for the estimated sample size for a proportion: $N = Z^2_{(1-\alpha/2)} \times P(1-P)/d^2$. Here, Z: The level of confidence (for a confidence level of 95%, Z = 1.96). P: The estimated proportion of students with good KAP regarding food labels. As we do not have prior data on this pattern, 50% was chosen as the default prevalence for sample size calculation. d: The margin of error (d=0.05). The minimum sample size was determined to be 384 participants. To account for potential errors in completing the questionnaire, an additional 5% was added (N=20). Furthermore, the percentage of non-respondents was approximately 56% (N=489) [18]. Consequently, the final sample size was adjusted to 893 participants. However, 1120 participants were included in the sample during the data collection period.

This cross-sectional study was conducted through an online survey platform, using a convenience sampling method to select participants. The online questionnaire was created using Google Forms, and the questionnaire link or QR code was sent to all general medicine students. It was administered in Vietnamese, the national language of Vietnam. The survey was conducted between January 25, 2022, and February 30, 2022. Out of the 3,005 students who received the survey, 1,120 responded. Thus, the response rate was 37.3%. Among the respondents, 37.7% were first-year students, 37.4% were second-year students, 35.9% were third-year students, 36.9% were fourth-year students, 37.8% were fifth-year students, and 37.8% were sixth-year students.

Instrument

The questionnaire was developed based on the U.S. FDA guidelines and questionnaires used in previous studies.[19-22] To ensure its face validity, the questionnaire was reviewed by two nutrition experts at the Department of Nutrition and Food Safety, Faculty of Public Health, Haiphong University of Medicine and Pharmacy, Vietnam. A pre-test was conducted with five students who did not participate in the study to assess their comprehension of the translated

materials and to ensure that the translated versions effectively conveyed the intended meaning in a culturally and contextually appropriate way for the target audience. This preliminary evaluation allowed us to make necessary adjustments to the translations before implementing the study, thus enhancing the overall validity and reliability of our research findings. All the questions were closed-ended. The questionnaire comprised four parts: Demographic characteristics, knowledge, attitude, and practice toward food labels.

The demographic characteristics of the participants: Gender (male, female), age, grade level (first, second, third, fourth, fifth, sixth), type of residence (urban, rural), living status (alone, living with friends, living with family or relatives), height (m), and weight (kg), and items related to the nutrition knowledge of participants. Self-reported weight and height were used to calculate body mass index (BMI, kg/m2), which was then classified into three categories: Underweight (BMI < 18.5 kg/m^2), Normal (BMI: 18.5 - 24.9 kg/m^2), and Overweight/obese (BMI ≥ 25 kg/m^2).[23] Grade levels were classified as low (first and second year of university), medium (third and fourth year of university), and high (fifth and sixth year of university). The questionnaire used to assess the nutrition knowledge of the participants was adapted from an international study, and each item was assessed by a 4-point Likert scale (1 = not at all important to 4 = very important).[14]

The knowledge regarding food labels: Have you ever heard about the existence of food labels (yes/no), through which sources of information, the information that should be included on food labels (yes/no), and the level of understanding of the information on food labels (5-point Likert scale ranging from 1 "totally don't understand" to 5 "very easy to understand").

The attitudes regarding food labels: The usefulness of food labels for consumers (yes/no), the necessity of reading food labels (5-point Likert scale ranging from "very unnecessary" to "very necessary"), the level of trust in food labels (5-point Likert scale ranging from "very unreliable" to "very reliable").

The practices regarding food labels: The frequency of reading food labels in general (5-point Likert scale ranging from "never" to "always"), the frequency of reading different information on food labels (5-point Likert scale ranging from "never" to "always), the frequency of reading nutrition facts (5-point Likert scale ranging from "never" to "always), the prioritization of purchasing food with labels (5-point Likert scale ranging from "never" to "always), and factors that influence food purchases. We used the item "the frequency of reading food labels in general" to assess the reading habits of the participants. The responses "always" or "often" were considered indicative of being in the habit of reading food labels.

Data analysis

All analyses were performed using Statistical Package for the Social Sciences (SPSS version 25.0, SPSS Inc., Chicago, IL, USA). Frequencies and percentages (%) were used for categorical variables, while mean and standard deviation (SD) were used for continuous variables. We applied Chi-squared tests to evaluate differences in the proportions of reading food labels and associated factors. Univariate and multivariate logistic regression analyses were used to calculate odds ratios (ORs) and their 95% confidence intervals (CIs) to examine associations between the habit of reading food labels and potential factors. Variables with a p-value < 0.25 in univariate were included in the multivariate analysis. Statistical significance was considered when $p < 0.05$.

Ethical Approval

The research protocol was approved in Decision No.225/QĐ-YDHP dated January 21, 2022, by the Scientific Council of Haiphong University of Medicine and Pharmacy.

RESULTS

The sample characteristics of the participants are presented in Table 1. Out of 1120 students, 34.7% were male. Students with low, medium, and high levels were 31.8%, 37.6%, and 30.6%, respectively. The average age of the participants was 21.36 ± 1.88 years. Most of the participants (60.5%) came from rural areas. The percentages of students living alone, with friends, and with family or relatives were 32.5%, 46.9%, and 20.6%, respectively. The percentage of students who were overweight or obese was 4.6%.

Table 1. Demographic characteristics of participants (N = 1120)

Variables	N	%
Age (years) (Mean ± SD)	21.36 ± 1.88	
Gender		
Male	389	34.7
Female	731	65.3
Grade level		
Low	356	31.8
Medium	421	37.6
High	343	30.6
Type of residence		
Urban	442	39.5
Rural	678	60.5
Living status		
Living alone	364	32.5
Living with friends	525	46.9
Living with family or relatives	231	20.6
Nutrition status		
Underweight (BMI < 18.5 kg/m^2)	273	24.4
Normal (BMI: 18.5 - 24.9 kg/m^2)	802	71.6
Overweight/Obesity (BMI ≥ 25 kg/m^2)	45	4.0

The nutrition knowledge of participants is presented in Table 2. The total score of nutrition knowledge of participants was 30.78 ± 5.95 points.

Table 2. Nutrition knowledge of participants (N = 1120)

Variables	Mean ± SD
Use salt or sodium only in moderation	3.16 ± 0.66
Have breakfast as it is the most important meal of the day	3.11 ± 0.77
Choose a diet with plenty of fruits and vegetables	3.23 ± 0.75
Use sugars only in moderation	3.04 ± 0.73
Choose a diet with adequate fibre	3.12 ± 0.74
Eat a variety of foods	3.06 ± 0.76
Maintain a healthy weight	3.10 ± 0.75

Variables	Mean ± SD
Choose a diet low in fat	2.98 ± 0.77
Drink at least six glasses of water (250 mL/glass) each day	3.05 ± 0.77
Eating meat is important because it is richer in protein	2.93 ± 0.76
Total score of nutrition knowledge	30.78 ± 5.95

Note: *Each item measured as very important = 4, somewhat important = 3, not too important = 2 and not at all important = 1*

The knowledge regarding the food labels of participants is presented in Table 3. Of the 1,120 students participating in the study, 1,049 had heard about food labels (93.7%). Most students (79.1%) had heard about food labels from the Internet or newspapers, while 7.5% had heard from medical staff. Over 80% of students thought that food labels should have information about the product's name, production dates, expiration dates, original product, ingredients, nutritional facts, and instructions for use and storage. More than 80% of students found it easy or very easy to understand food label information related to the product's name, production dates, expiration dates, original product, net weight, and instructions for use and storage. Only about 20% of students found it easy or very easy to understand information related to ingredients, nutrition facts, and allergens.

Table 3. Knowledge regarding food labels of participants

Variables	Yes N (%)	No N (%)
Ever heard about the existence of food labels	1049 (93.7)	71 (6.3)
Sources of information on food labels (N = 1049)		
Internet or newspaper	830 (79.1)	219 (20.9)
Television	529 (50.4)	520 (49.6)
Sellers	332 (31.6)	717 (68.4)
Medical staff	79 (7.5)	970 (92.5)
Family/friends	536 (51.1)	513 (48.9)
Indicators that should be included on food labels (N = 1120)		
Name of product	988 (88.2)	132 (11.8)
Production/expiry date	1084 (96.8)	36 (3.2)
Original product	1071 (95.6)	49 (4.4)
Ingredients	989 (88.3)	131 (11.7)
Nutritional facts	929 (82.9)	191 (17.1)
Allergens	832 (74.3)	288 (25.7)
Net weight	836 (74.6)	284 (25.4)
Instructions for use and storage	927 (82.8)	193 (17.2)
Alcohol content	830 (74.1)	290 (25.9)

	Totally don't understand N (%)	Quite confusing N (%)	Neutral N (%)	Easy to understand N (%)	Very easy to understand N (%)
Level of understanding about the information on the food label of participants (N = 1120)					
Name of product	0 (0)	0 (0)	0 (0)	746 (66.6)	374 (33.4)
Production/expiry date	5 (0.4)	2 (0.2)	83 (7.4)	575 (51.3)	455 (40.6)
Original product	4 (0.4)	4 (0.4)	139 (12.4)	630 (56.3)	343 (30.6)
Ingredients	5 (0.4)	120 (10.7)	714 (63.7)	233 (20.8)	48 (4.3)
Nutritional facts	38 (3.4)	240 (21.4)	614 (54.8)	196 (17.5)	32 (2.9)
Allergens	33 (2.9)	207 (18.5)	656 (58.6)	198 (17.7)	26 (2.3)
Net weight	6 (0.5)	10 (0.9)	138 (12.3)	678 (60.5)	288 (25.7)
Instructions for use and storage	4 (0.4)	4 (0.4)	129 (11.5)	715 (63.8)	268 (23.9)
Alcohol content	7 (0.6)	64 (5.7)	545 (48.7)	380 (33.9)	124 (11.1)

The attitude regarding food labels of participants is shown in Table 4. 99.1% of students believed that food labels are helpful for consumers. 41% of students considered reading food labels to be very necessary. However, the percentage of students feeling confident or very confident about the truthfulness of food labels was 33.8% and 2.9%, respectively.

Table 4. Attitude regarding food labels of participants (N = 1120)

Variables	N	%
Are food labels useful for consumers		
Yes	1110	99.1
No	10	0.9
The necessary of reading food labels		
Very unnecessary	22	2.0
Unnecessary	12	1.1
Neutral	133	11.9
Necessary	494	44.1
Very necessary	459	41.0
Level of reliability in food labels		
Very unreliable	14	1.3
Unreliable	38	3.4
Neutral	657	58.7
Reliable	378	33.8
Very reliable	33	2.9

The practice regarding food labels of participants is shown in Table 5. The percentage of students who often or always read food labels was 23% and 7.5%, respectively. Most students only read the product's name and the expiration date on the food labels, while about 10% of students often or always read the information on nutrition labels. The percentage of students who often or always preferred buying food with labels was 43.8% and 33.0%, respectively. Price was the most crucial factor when buying food (78.7%).

Table 5. Practice regarding food labels of participants

Variables	Never N (%)	Seldom N (%)	Sometime N (%)	Often N (%)	Always N (%)
Frequency of reading food labels (N = 1120)	5 (0.4)	225 (20.1)	548 (48.9)	258 (23.0)	84 (7.5)
Frequency of reading information on food labels (N = 1115)					
Name of product	2 (0.2)	17 (1.5)	319 (28.6)	436 (39.1)	341 (30.6)
Expiration date	1 (0.1)	21 (1.9)	422 (37.8)	341 (30.6)	330 (29.6)
Original product	17 (1.5)	332 (29.8)	458 (41.1)	235 (21.1)	73 (6.5)
Ingredients	50 (4.5)	478 (42.9)	325 (29.1)	193 (17.3)	69 (6.2)
Allergens	273 (24.5)	401 (36.0)	277 (24.8)	114 (10.2)	50 (4.5)
Net weight	28 (2.5)	269 (24.1)	502 (45.0)	239 (21.4)	77 (6.9)
Instructions for use	6 (0.5)	69 (6.2)	619 (55.5)	316 (28.3)	105 (9.4)
Instructions for storage	13 (1.2)	294 (26.4)	462 (41.4)	266 (23.9)	80 (7.2)
Frequency of reading information on nutrition labels (N = 1115)					
Serving sizes	385 (34.5)	335 (30.0)	235 (21.1)	116 (10.4)	44 (3.9)
Servings per container	398 (35.7)	327 (29.3)	250 (22.4)	100 (9.0)	40 (3.6)
% Daily values	398 (35.7)	324 (29.1)	252 (22.6)	101 (9.1)	40 (3.6)
Calories	375 (33.6)	332 (29.8)	247 (22.2)	115 (10.3)	46 (4.1)
Protein	386 (34.6)	343 (30.8)	256 (23.0)	90 (8.1)	40 (3.6)
Carbohydrates	385 (34.5)	346 (31.0)	252 (22.5)	91 (8.1)	41 (3.7)
Total fat	385 (34.5)	345 (30.9)	248 (22.2)	97 (8.7)	40 (3.6)
Saturated fat	389 (34.9)	347 (31.1)	248 (22.2)	93 (8.3)	38 (3.4)
Trans fat	393 (35.2)	341 (30.6)	252 (22.6)	91 (8.2)	38 (3.4)
Sodium	396 (35.5)	341 (30.6)	260 (23.3)	86 (7.7)	32 (2.9)
Sugar	387 (34.7)	335 (30.0)	247 (22.2)	104 (9.3)	42 (3.8)
Prioritize buying food with labels (N = 1120)	27 (2.4)	23 (2.1)	210 (18.8)	490 (43.8)	370 (33.0)

Factors determining food purchase (N = 1120)		
	N	%
A valuable brand	638	57.0
Price	881	78.7
Ingredient	424	37.9
Nutritional facts	454	40.4
Original product	294	26.3
Personal interest	602	53.8
Follow by the advice of others	198	17.7

Factors associated with reading food labels are presented in Table 6. Multivariate logistic regression analysis showed that type of residence, and nutrition knowledge were significantly associated with reading food labels ($p < 0.05$).

Table 6. Factors associated with the practices of reading food labels: Univariate and multivariate logistic regression analysis (N,%)

Variables	Often reading food labels[a]		Univariate OR (95%CI)	Multivariate aOR (95%CI)
	No (N=778)	Yes (N=342)		
Gender				
Male	296 (76.1)	93 (23.9)	1	1
Female	482 (65.9)	249 (34.1)	**1.64*** (1.24 - 2.17)**	1.33 (0.97 - 1.82)
Grade level				
Low	262 (73.6)	94 (26.4)	1	1
Medium	289 (68.6)	132 (31.4)	1.27 (0.93 - 1.74)	1.32 (0.93 - 1.88)
High	227 (66.2)	116 (33.8)	**1.42* (1.03 - 1.97)**	0.96 (0.66 - 1.38)
Type of residence				
Urban	343 (77.6)	99 (22.4)	1	1
Rural	435 (64.2)	243 (35.8)	**1.94*** (1.47 - 2.54)**	**1.68** (1.24 - 2.27)**
The necessary of reading food labels[b]				
Unnecessary	123 (73.7)	44 (26.3)	1	1
Necessary	655 (68.7)	298 (31.3)	1.27 (0.88 - 1.84)	0.92 (0.61 - 1.39)
Level of reliability in food labels[c]				
Unreliable	504 (71.1)	205 (28.9)	1	1
Reliable	274 (66.7)	137 (33.3)	1.23 (0.95 - 1.60)	1.04 (0.77 - 1.39)
Nutrition knowledge score[d]			**1.20*** (1.17 - 1.24)**	**1.20***(1.17 - 1.24)**

Abbreviation: *OR: Odds Ratio, aOR: Adjusted Odds Ratio, CI: Confidence Interval*
Notes: *Bolded numbers are significant at p < 0.05 (*<0.05, **<0.01, ***<0.001)*
[a] *"Often" and "Always" has been merged into "Often";* [b] *"Necessary" and "very necessary" has been merged into "Necessary";* [c] *"Confident" and "very confident" has been merged into "Confident";*
[d] *Nutrition knowledge score was considered as continuous variable.*

DISCUSSION

For the first time, our study investigated the KAP of using food labels among medical students in Vietnam. We found that most participants were aware of food labels, and their knowledge was acquired from various sources, mainly the Internet or newspapers. These findings are consistent with similar research conducted in Lebanon.[24] Access to the Internet is affordable in developing countries, and therefore, users have rapidly grown.[25] Vietnam is among the countries with the most Internet users in Asia.[26] At the outset of 2022, it is noteworthy that approximately 73.2% of the entire population of Vietnam was found to be actively engaged as Internet users.[27] Young consumers, in particular, frequently use social media platforms like Facebook, Instagram, YouTube, and Zalo to obtain information.[28] This indicates that social media platforms could be an effective tool for policymakers to disseminate information about food labeling and other health-related issues to a broader audience, especially among the younger generation. In our study, most students knew the basic information that should be included on a food label, such as the product name, production date, expiration date, original product, ingredients, and nutrition facts. However, we also found that while many students agreed that nutritional facts should be included on food labels, only some understood this information. This is consistent with the findings of research conducted in China, where only 15% of the population knew how to read nutrition labels.[29]

The study found that most students considered reading food labels necessary. This finding is consistent with the results of research conducted in South Africa,[14] whereas another study conducted at a medical college in an Arab country showed that more than half of the students believed that reading food labels was essential, even though they did not always use the information provided.[15] Overall, the study highlighted that research participants recognized the importance of reading food labels. We found that price was the main factor determining whether students decided to buy food. This may be because the research participants were mainly students who depended on their families for financial support, and therefore, the price was a crucial factor in their purchasing decisions. Nielsen's report suggests that price is a crucial factor in purchasing decisions among Vietnamese shoppers. The report showed that price was among the top two influencing factors for 19 product categories.[30] Our study also revealed that a low percentage of students believed or strongly believed in food labels. This is consistent with several other studies that have reported skepticism regarding the accuracy of claims on food labels. For example, a study by Malek Mahdavi et al. (2012) and Wenjuanxing (2022) reported similar findings, indicating that consumers may not always trust the information provided on food labels.[20, 31]

In our study, the percentage of students who usually and always read food labels, especially the nutritional facts, was very low. This percentage was lower than that reported in previous studies conducted in other countries.[20, 32, 33] Another important finding of this study is that very few students read the nutritional information on food labels when purchasing foods. These findings are consistent with previous studies conducted on Iranian, Malaysian, and Indonesian students.[16, 20, 34] A research study that examined the dietary habits of medical and university students in Asian countries also highlights a concerning trend regarding the low prevalence of reading food labels, particularly nutritional facts. The revelation is that few students engage

with nutritional information on food labels when making food choices.[35] These findings underscore the need for targeted interventions and educational campaigns to improve nutrition literacy among students in Asia, ultimately promoting healthier dietary choices and contributing to public health outcomes in the region.

Research shows that women are more likely to read food labels than men.[36, 37] This can be explained by the fact that men are less concerned about nutrition and health issues than women.[38] Another reason could be that traditional gender roles may have encouraged women to be meticulous in choosing food for the whole family.[39] Our study also showed that the percentage of women reading labels was higher than that of men. However, this gender difference was not statistically significant. Previous studies have found that people living in urban areas were more likely to read food labels than people living in rural areas. This was explained by the fact that rural consumers with low socioeconomic conditions tend to value price and rarely refer to labels.[40] However, the results of our study showed the opposite trend. We also found that nutrition knowledge is associated with reading food labels. Consistent with the results of a literature review by Miller et al.[41] A study in the UK surveyed 500 college students selected randomly online and found a correlation between prior knowledge about nutrition and the students' self-reported use of food labels.[42] Nutrition labels are an essential tool to help consumers understand the nutritional composition of foods and make accurate choices.[43, 44] It effectively conveys nutritional information to consumers.[41] Frequent use of nutrition labels has been shown to reduce the intention to purchase unhealthy foods[45] and can positively impact consumers' diets.[46]

The results of our study cannot be generalized to all medical students in Vietnam. However, these results serve as a premise for future research related to reading food labels and nutrition labels. Future research based on the findings from this quantitative study should be conducted, for example, to understand the determinants of food label reading, why students do not read food labels and the role of cultural and social factors in reading food labels.

CONCLUSION

The knowledge, attitude, and practice regarding food labels among university students are unsatisfactory. Therefore, it is recommended that active intervention measures be implemented to integrate nutrition education into the student curriculum, promoting a greater understanding of nutrition among university students and encouraging healthier eating habits.[31, 42] This will enable them to transmit the information to their future patients and the community.

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CONFLICTS OF INTERESTS

The author declares no conflict of interest in this study.

AUTHORS' CONTRIBUTION

CMD and NTT designed the study; CMD, CKT, and PTD conducted research; CMD, HVH, and PTD analyzed data; CMD

wrote the manuscript. CMD had primary responsibility for the final content. All authors have read and agreed to the published version of the manuscript.

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