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Research Paper

Knowledge of Food Label Among Master's Students of Home Science in Kathmandu: A Cross-Sectional Study

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Abstract

The part of food labels that states the amount of nutrients is called nutrition labeling. This comprises a list of components, a nutrition information table, health endorsement logos and nutritional content claims on product labels. Food labeling is an essential part of any product. As a food producer, it is not only legally required but also empowers customers to make informed food purchases and ensures the safe storage and use of their purchases. Students in food and nutrition should be knowledgeable in the topics of label reading, healthy eating, and how to use food labels as future nutritionists. With this sound understanding, they will be able to counsel their future patients on the proper use of food labels and, as a result, become change agents in the community. It can also help people live healthier lives if food labels are used appropriately. This study aimed to evaluate students' understanding of food labels in home science. Using a descriptive cross-sectional approach, data were collected through purposive sampling. The findings indicated that among the 118 participants, the majority (98%) were aware of the food labels, although only about half could interpret all the information on them. The study suggests that although most students recognize food labels, they may lack a comprehensive understanding of the details provided. This underscores the importance of public awareness campaigns and educational programs to improve consumer knowledge and the effective use of food label information.

Keywords: *Food Label, Nutrition Information, Nutrition Knowledge, Nepal*

INTRODUCTION

A commonly accepted definition of a food label is any tag, brand, symbol, image, or descriptive element that is written, printed, stamped, embossed, or affixed to a food container. This includes all textual, printed, and visual details on food packaging, as outlined by the Food and Agriculture Organization (FAO). Food labels are essential for encouraging a balanced diet because they offer consumers critical information about the nutritional content of foods. This enables individuals to compare similar items and make informed decisions in support of healthy diet. Food labels serve as a crucial public health resource, helping consumers understand the nutritional value of food and sell food products (Scalvedi et al., 2021). Consumers are attracted to buying healthy foods and beverages from food labels to satisfy personal health goals (Shangguan et al., 2019). Food labels are essential in enabling informed consumer choices and preventing deceptive, misleading, or inaccurate practices. Researchers have concluded that labeling statements on food products contributes to greater consumer awareness and promotes healthier decision-making. The relationship between diet and disease is widely recognized, with many diseases being controlled or prevented through appropriate dietary choices. Nutrition is a key factor in the onset of chronic diseases, disabilities, and early mortality. To combat the prevalence of chronic diseases, it is crucial to actively improve our nutrition. One effective approach is nutrition labeling, which helps guide

food choices (Viviana Viola et al., 2016). Research indicates that individuals who read nutrition labels generally have healthier diets than those who do not. Most people, particularly college students, buy prepackaged foods while grocery shopping. The nutrition label on these prepackaged foods includes the nutrition composition table, the nutrition claim, and the nutrition function claim, all of which are essential for providing consumers with accurate nutritional information and assisting them in making healthier food choices (Shireen S et al., 2022). Previous studies have suggested that various psychological, social, and environmental factors influence university students' eating habits. Factors such as fast-food advertisements and a lack of awareness about healthy food options contribute to poor dietary behaviors (Deforche et al., 2015). Additionally, college students' eating habits can be influenced by peer pressure, university living conditions, and exam stress. Research has shown that changes in living arrangements affect their food choices. These habits significantly impact the development of communicable diseases, such as cancer, obesity, hypertension, and cardiovascular disease. Adolescence is an ideal period for effective prevention campaigns because dietary choices and physical inactivity are key controllable risk factors. Adequate nutritional knowledge (NK) refers to awareness of nutrition-related behaviors and ideas concerning food consumption, nutrient sources, and nutritional standards. A strong understanding of nutrition is crucial for making healthy eating choices, preventing diseases, and promoting overall wellness.

Therefore, reliable nutritional information is crucial for adjusting dietary habits. People frequently examine food labels for details such as calorie content, fat, sugar, sodium, and fiber. In addition to these aspects, they often take into account serving size, ingredient lists, health and nutrition claims, cost, and brand when deciding which foods to buy. Research conducted by Nurliyana et al. (2011) indicated that students with a high level of nutrition knowledge frequently refer to food labels when making purchasing decisions, and several problems are associated with the use of these labels. Nurliyana showed that students with good nutrition knowledge frequently use food labels to guide them during food purchases (Nurliyana et al., 2011). There are several problems with using food labels. Some consumers lack adequate understanding of food nutrition labels, which can hinder their ability to make healthy food choices. As a result, poor food choices may lead to high-calorie, fat, sodium, and refined-carbohydrate diets. Research suggests that individuals with higher education levels are more likely to use food labels effectively. Furthermore, students expressed a desire for more knowledge on food labels to make healthier choices in settings such as schools, homes, and restaurants, indicating a need for enhanced education on nutrition labels. Given the significant impact of students' knowledge and use of food labels on their dietary choices, educating them on the importance of reading food labels is essential. Consequently, this study aimed to assess knowledge and practices regarding food labels among fourth-semester master's students. No similar research has been conducted in Nepal, so this study contributes new insights into students' use of food labels, supporting health education programs aimed at promoting positive consumer behaviors. Because many diseases are diet-related and can be managed or prevented with appropriate diet, providing comprehensive nutritional information is crucial for fostering healthier eating habits.

LITERATURE REVIEW

The term "food label" refers to any written, printed, stenciled, marked, embossed, impressed, or other descriptive material that is placed on or affixed to a food container. Any textual, printed, or visual material that appears on the label, is attached to the food, or is placed next to the food, is considered food labeling. This includes information intended to promote the sale or disposal of the food (Temple, 2019). Governments declared in 2014 at the Second International Conference on Nutrition (ICN2) that" commission of consumers is necessary through bettered and substantiation-

based health and nutrition information and education to make knowledgeable opinions about the food products they consume to maintain a healthy diet (Jones et al., 2019).

The batch number, manufacturing date, weight, and clear statement of class-II preservatives must all be included on food product labels. Customers can learn more about food products and check for any health risks by reading the label, which includes information about the food and its processing. Numerous studies and improvizations have been conducted worldwide on this topic (Khatiwada, 2017).

Norazmir examined the knowledge, attitudes, and practices of 329 university students regarding the use of nutritional information and food labels. Findings indicated that only 21.6% of students "often" considered food labels when making purchasing decisions. Key factors influencing food choices included expiration date (98.5%), taste (95.7%), price (92.4%), and nutrient content (90.5%), all of which were significantly related to food label usage. The study revealed a meaningful link between nutrition knowledge and label use; 55% of students had nutrition knowledge, with 34.9% of those frequently using labels during purchases, while 5.5% never referred to them. This finding suggests that students with solid nutrition knowledge are more likely to use food labels when making purchasing decisions (Nurliyana et al., 2011).

A cross-sectional study conducted by Malek Mahdavi examining knowledge, attitudes, and practices related to food labeling among 332 students aged 18–25 across five academic fields (public health, nutrition, engineering, health services administration, and paramedical sciences), 89.2% of participants agreed that food labels enhance consumer understanding of nutrition. While 79.2% of students perceived the nutrition claims on food labels as inaccurate, 77.4% still found the labels helpful. Regarding usage, 84% of students reported that they always or frequently reviewed nutrition facts before making a purchase, with the expiration date and storage instructions identified as the most important information. However, only 32.3% of the participants applied this information in daily dietary choices, and fatty acids were noted as the least significant ingredient at 1.9%. These results suggest that food labels play a valuable role in students' nutrition awareness and influence their dietary understanding (Malek Mahdavi et al., 2012). Christophers' study on factors associated with nutrition label use among college students and young adults conducted a systematic review of existing studies to uncover trends in the use of food labels.

Within this age group (18–30 years). Through keyword and reference searches, sixteen relevant studies based on college surveys from four countries (USA, UK, Canada, and South Korea) were identified. The frequency of nutrition label use varied considerably across these studies; however, a weighted average indicated that 36.5% of college students and young adults reported always or often using labels, 36.7% used them sometimes, and 26.8% rarely or never used them. In twelve of thirteen studies evaluating gender disparities, women were more likely to use nutrition labels. Nutrition label use was also found to be associated with attitudes toward a healthy diet, belief in the importance of nutrition labels in guiding food selection, self-efficacy, nutrition knowledge, and education awareness regarding food labels in a global context in Asia (Christoph et al., 2016).

A descriptive study by Audreyl examined the awareness, perceptions, and self-reported purchasing behaviors of college students regarding front-of-package nutrition labeling systems and symbols, involving a sample of 936 students. However, there was a significant association between attitude and the use of nutrition labels on food purchase decisions among the students. Results showed that attitude was the most important component in using nutrition labels, although knowledge and gender had little impact on how often people used them when buying food. A total of 400 Mauritius residents participated in a (Nurliyana et al., 2011) surveyed consumer knowledge and attitudes about nutritional labels. The findings indicate that there are statistically significant (P <.05) associations between demographic characteristics, nutritional label use, and understanding.

The understanding of nutritional labels was substantially (P <.05) correlated with all demographic characteristics except gender. The use of nutritional labels was influenced by factors such as family size,age, education, income, and nutrition expertise. The goal of health advocates is to use nutritional labels more frequently (Cannoosamy et al., 2014).

Quantitative descriptive research was conducted by Mahmuudah on nursing students' understanding of nutrition label reading and food packaging types. Out of 229 students, 55.5% demonstrated a solid understanding of how to read nutrient labels. The five processed foods most commonly consumed by nursing students were yogurt (59.8%), pudding (50.2%), chocolate bars (55.9%), cake (54.6%), and processed meatballs (54.1%). Based on the results, the nutrient label knowledge of nursing students was sufficient, but there needed to be an even distribution of nutrient label knowledge across the entire student stage (Mahmuudah et al., 2020).

Rabab and Wahab conducted a descriptive cross-sectional study to evaluate consumers' knowledge, attitudes, and practices regarding food labeling in the Kingdom of Bahrain. A total of 430 consumers were interviewed at various grocery stores using a structured questionnaire. Findings indicated that awareness of reading food labels was generally low; while 65% of consumers purchased prepackaged foods, only 42% reported reading the food labels. Among those who did, 92% focused primarily on basic information, such as manufacturing and expiration dates. In addition, 60% of respondents believed that food labeling could benefit consumers (Wahab, 2018).

RESEARCH METHOD

A cross-sectional study was conducted at the Central Department of Home Science, Tribhuvan University, Kathmandu. The purposive sampling method was implemented in this study. The central department of Home Science's 118 master's students in food and nutrition were selected for the study. The questionnaire was distributed, and the collected information was examined and evaluated based on the study's goals. A self-administered, open-ended, multiple-choice questionnaire was used to assess participants' knowledge of food labels.

Data Analysis

The accuracy and completeness of the data were verified and examined. The Statistical Software for Social Sciences (SPSS) was used to analyze the data and determine descriptive and inferential statistics. Data analysis was performed using frequency distribution, and the chi-square test was used to determine the association between knowledge level and selected demographic variables.

Ethical Consideration

Prior to data collection, ethical permission was obtained from Tribhuvan University's Central Department of Home Science of Tribhuvan University's Committee for Human Research Publication and Ethics.

FINDINGS AND DISCUSSION

The study was conducted at Tribhuvan University in Kathmandu's Central Department of Home Science. The finding of the present study is that out of 118 respondents, 52% had a high level of knowledge about food labels, followed by 27% who had a medium level of knowledge and 21% who had a poor level of knowledge.

Results and data analysis are tabulated and presented. The study's conclusions are shown as follows:

Table 1. Sociodemographic characteristics of respondents

Demographic Variables		Frequency	Percent
Age	21-30 years	70	59
	31-40 years	48	41
Occupation	Business	8	7
	Private Organization	39	34
	Students	50	42
	Government Job	21	17
Religion	Hindu	100	84
	Buddhist	14	12
	Christian	4	4
Marital Status	Single	55	47
	Married	63	53
Family Income (Nepali Rupees)	<10,000	2	2
	10,000-20,000	12	10
	20,000-30,000	31	26
	>30,000	73	62

(n=118)

According to Table 1, 41% of respondents were between the ages of 31 and 40, and 59% were between the ages of 21 and 30. Of them, 47% were unmarried and 53% were married. Of the respondents, 42% were students, 34% worked for a private company, 17% worked for the government, and 7% worked in the business world. Sixty-two percent of the respondents' families made more than NRs 30,000 annually.

Table 2. Knowledge about Food Label

Variable	Frequency	Percent
Basic Knowledge of Food Labels		
Yes	114	98
No	4	2
Knowledge about the information on the food label		
Yes	70	65
No	48	35

(n=118)

According to table 2, 98% of respondents were aware of the food label, 65% were familiar with all the information on the label, and 35% were not familiar with all the information on the label.

Table 3. Knowledge about each food label

Knowledge of food labels	Frequency		Percentage
Does the label indicate the serving size?	Yes	87	<u>72</u>
	No	20	18

Knowledge of food labels	Frequency		Percentage
	I don't know.	11	10
The genuineness of food	The food should match the description	87	<u>72</u>
	The food should taste good.	7	7
	It should be cheap.	2	3
	I don't know.	22	18
How nutrients are usually measured	In GM or milligrams	107	<u>89</u>
	In ounces or pounds,	8	7
	In kilograms	3	4
A food product made with real fruit is mostly made up of	True	68	<u>58</u>
	False	50	42
The green dot symbol identifies	Non-vegetarian	8	7
	Vegetarian	110	<u>93</u>

Table 4 demonstrates that the majority of the respondents i.e. 98% knew about the food label, but only half of the respondents understood each information presented in the food label. Furthermore, 72% of the respondents knew the Genuineness of food. Regarding the measurement of nutrients, 89% gave correct responses. Regarding serving size, 89% of respondents gave correct answers, whereas 11% of respondents gave incorrect answers. Among them, 88% of the respondents knew about calories, whereas 12% did not know about calories. Regarding empty-calorie food, 45% of respondents gave correct answers, whereas 55% gave incorrect answers. Regarding vegetarian and nonvegetarian symbols, most respondents i.e. 92%) recognized the green dot symbol (vegetarian), and only 8 % did not know about the symbol.

Table 4. Level of Knowledge on Food Labels

Variable	Frequency	Percentage	Mean score
High	60	<u>52</u>	<u>14-17</u>
Medium	33	27	10-13
Low	25	21	<9

The table demonstrates that 52% of respondents had a high level of knowledge about food labels, followed by 27% who had a medium level of knowledge and 21% who had a poor level of knowledge.

Table 5. Association between Level of knowledge on Food Labels with Selected Demographic Variables

Variable		Knowledge			Total	p-value
		High	**Average**	**Low**		
Age	21-30 years	26	29	13	68	0.367 p >0.05
	31-40 years	21	16	13	50	NS
Occupation	Business	3	2	2	7	
	Private organization	20	14	6	40	0.581 P>0.05
	Students	18	19	14	51	NS
	Government job	7	8	5	20	
Religion	Hindu	40	37	22	99	0.329
	Buddhist	6	5	3	14	P> 0.05 NS
	Christian	0	4	1	5	
Marital status	Single	23	22	12	55	**0.043**
	Married	24	24	15	63	**P<0.05 S**
Family income (NRs)	<10,000	1	2	0	3	
	10000-20,000	2	5	5	12	**0.025 P<0.05**
	20,000-30,000	12	11	8	30	**S**
	>30,000	33	27	13	73	

n=118

As shown in Table 5, the study revealed the relationship between the chi-square test-calculated Knowledge of Food Labels and a subset of Demographic factors. Knowledge of food labels was associated with family income and marital status, but not age, location of residence, race, religion, or employment.

Discussion

In this study, 118 Masters' students were selected as a sample. The finding of the present study is that out of 118 samples, the majority of the respondents i.e. 98 percent know about food labels but only half understand each information present on the food label, which raises the possibility that they will read the information and even recognize food labels, but they may be perplexed by all the information on the label, which may reduce their chances of using and learning all the information on the food label study conducted by Similar results were found by Tandoh in 2023, indicating that participants' awareness of food labels was strong. While purchasing packaged goods, consumers also recognized the value of food labels, although their understanding of all the information on the labels was limited (Tandoh et al., 2023). Majority of customers surveyed in Mehanna's study had a favorable view toward food labeling, although over half were unaware of the contents present in food labels. Consumers read the nutritional data least frequently. Higher education levels, age, gender, and increased awareness were all highly predictive of reading food

labels (Mehanna et al., 2024).

Zaini's study on university students' knowledge, attitudes, and practices regarding the usage of food labels revealed similar results: 61% of students had high knowledge, 21% had moderate knowledge, and 17% had low knowledge (Evelyn et al., 2020). The finding of the present study indicates that the majority of the respondents i.e. 52 percent had a high level of knowledge about food labels, followed by 27 percent with medium-level knowledge about food labels and 21 percent with a low level of knowledge about food labels. Previous studies have shown that the level of knowledge about food labels influences their use. It was also supported by Blitstein and Evans (2006). WHO states that higher-level nutrition knowledge was more likely to use nutrition information on food labels when purchasing food. Additionally, those with higher education levels appear to be more capable of interpreting the information provided on the nutrition label and incorporating such information into a healthy diet (Moore et al., 2018).

In this study, the obtained values show an association between the level of knowledge on food labels and marital status and family income. There was no association between knowledge of food labels and age, place of residence, ethnicity, religion, and occupation. Similar findings were found in a study by Yinxia Liao, which suggested that women used nutrition labeling more frequently, had more positive attitudes toward it, and knew more about it. This trend was likely due to women buying and cooking food more frequently than men. Compared with inhabitants with lower monthly family incomes, those with higher monthly incomes had greater nutrition awareness. Regarding nutrition labeling knowledge, attitude, and practice, inhabitants in better economic situations performed better than those in worse economic situations (Liao & Yang, 2023). Similar results were found in Simone's research, which showed that lower-income families buy less nutritious foods than higher-income households. Income disparities in dietary knowledge and consumption quality may be mediated by food purchase behaviors (French et al., 2019).

Even though some respondents had outstanding understanding, there were still places for development, and respondents from different demographic backgrounds had varying levels of label knowledge. Due to their greater domestic responsibilities, married women were shown to know more about nutrition; labels than single women (Van Der Merwe et al., 2013).

CONCLUSION

Food labels are an important public health tool that can be used to promote a balanced diet. Food label information helps consumers better understand their nutritional value. Based on the findings, the majority of the respondents know about food labels, but only half of the respondents understand each information presented in the food labels. In this regard, 52% have a high level of knowledge about food labels, followed by 27% with a medium level of knowledge and 21% with a low level of knowledge.

This study discovered a strong correlation between food label awareness and demographic factors, including family income and marital status. According to research, there are still some gaps in understanding how to use food labels and uncertainty about the many pieces of information that are available in them, even after studying food and nutrition. Even though some respondents had outstanding understanding, there were still places for development, and respondents from different demographic backgrounds had varying levels of label knowledge. Due to their greater domestic responsibilities, married women knew more about nutrition; labels than single women. According to this research, there is a need for education and awareness campaigns on the significance of food labeling, how to correctly and accurately read food labels, and how each piece of information should be encouraged to be used in everyday life.

LIMITATION & FURTHER RESEARCH

The study was conducted in a single setting. The study findings could not be generalized in the country's total population due to the sample size being collected from only one college.

Recommendations
- Demographics that are less likely to read Nutrition Facts labels and the causes of this infrequent label use should be the main topics of future study.
- Suggested the implementation of food label awareness and education initiatives to assist enables customers to make informed food purchase decisions

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