Original Research Article

Relevance of food labels among selected students at the University of Cape Coast, Ghana

ABSTRACT

Food labels are important public health tool that provides consumers with nutritional information to make informed and healthier food choices. This study aimed at determining the level of knowledge and understanding of nutritional information on food labels and its impact on food choices among students at the University of Cape Coast, Ghana. A cross-sectional study employing random sampling was used to recruit 200 study participants. A pre-tested structured questionnaires were used to obtain data on socio demographic characteristics, frequency of food label use and nutritional knowledge of the students. Pertaining to the frequency of food label use, 27.5% of students always use food labels, while 11% never use food labels. While most of the students were aware that packaged foods have labels, most of them do not refer to information on the labels when making purchases. Expiry date was considered the most important information on food labels, while the students may refer to labels mostly for health reasons. The students considered time wasting to be the major reason they might not refer to labels. However, majority of the students know what constitutes a balanced diet and how it can be achieved. There was no effect of gender, and level of study on the use of food labels, while no association was observed between nutritional knowledge of the students and the use of food labels.

Key words: Food labels, pre-packed foods, nutritional information, students

1. INTRODUCTION

A food label is described as the identity card of food products [1], which additionally serves as a guide for the selection of consumable products to meet specific nutritional needs of consumers. Food labels are a must for all pre-packed foods as it conveys information about the composition, ingredients and the proportionate quantity. Additionally, consumers obtain information on quality, origin, processing and preservatives in food [1]. Thus, food labels may inherently have protective and health-promoting properties if the message it conveys is well understood and appropriately contextualized [2].

On the other hand, patronage of convenient pre-packed foods, especially among young adults has escalated [3] and typically among students, not only for the convenience and ease of accessibility, but also out of keen interest to explore exotic food products [4]. This is of concern because some pre-packed foods may have issues of nutritional inadequacies including the presence of allergens, high levels of saturated fats, sugars and salts, as well as low dietary fibre and vitamins [5]. Thus, particular attention to food labels may be necessary to reduce over-reliance on some pre-packed foods, whose excessive consumption could pose severe health threats. Indeed, increasing rates of diet-related diseases such as obesity, hypertension and diabetes has been observed in Ghana [6] and other parts of the world [7]. Apart from low physical activity, consumption of (ultra) processed culinary food ingredients, which form the bulk of energy-dense pre-packed foods are also implicated [8].

In Ghana, just as in other countries, food label policies and guidelines have been developed to regulate the purchasing behaviour of consumers [9]. Among the mandatory labelling requirements for pre-packed foods produced and/or consumed in Ghana are product name, list of ingredients, processing aids and additives, and product weight or volume. Other requirements include the name and address of the manufacturer, the country of origin, date of manufacture, instruction for storage and usage, as well as batch/lot number [10].

According to Miller & Cassady [3], consumers with prior nutritional knowledge show a higher likelihood of effectively using a food label, and thus, benefit more from healthful decisions based on the nutritional information. University students have a wide range of academic programmes, which can expose students to different levels of nutritional information, and thus, contribute to the use of food labels. We tested the strength of the inter relationships between study programs, knowledge and understanding of food labels and the influence of the latter on food choices. For this, the College of Health and Allied Sciences (COHAS) of the University of Cape Coast, where diverse programmes including Clinical Nutrition and Dietetics, Physician Assistant, Diagnostic Imaging Technology, Diagnostic Medical Sonography, Health Information Management, Biomedical Sciences, Medical Laboratory, Sports Science, and Optometry are run, was selected as a case study. The study contributes basic data that would be useful for expanding avenues for acquisition of nutritional information, especially among young adults for fully exploiting the advantages of food labels on pre-packed foods.

2. MATERIALS AND METHODS

2.1 Research design

A descriptive cross-sectional study was used to ascertain the knowledge level and understanding of nutrition information on food labels, and its impact on food choices among students of the University of Cape Coast.

2.2 Study population

The study population comprised students from the School of Allied Health Sciences at the University of Cape. The school has a student population of over 4000 and runs 9 undergraduate programmes in Clinical Nutrition and Dietetics, Physician Assistant, Diagnostic Imaging Technology, Diagnostic Medical Sonography, Health Information Management, Biomedical Sciences, Medical Laboratory, Sports Science, and Optometry.

2.3 Sample size and sampling procedure

A sample size of 200 was used in this study. To calculate the sample size, the Cochran formular was used as follows.

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n is the sample size, Z is the statistic corresponding to level of confidence, P is expected prevalence and d is precision (corresponding to effect size).

Participants were selected using multistage sampling. A simple random sampling method was employed to select 7 out of the 9 programmes. To do this, the names of all 9 programmes were written on pieces of papers, mixed up in a bowl and selected by the principal investigator while blindfolded and without replacement. To obtain a specific number of students from each programme, the total number of students in each programme were divided by 7 and multiplied by the calculated sample size (200). Using simple balloting method, pieces of folded papers with YES or NO written on them were mixed in a bowl and given to the students to select. Students who selected YES and met the inclusion criteria were recruited for the study.

2.4 Data collection procedures

Preceding the administration of the research instruments, the reason for the study was explained to the respondents. Questionnaires were given to students who were willing to partake in the study. Also, participants were educated on the voluntary nature of the study. Students willing to participate were assured of high level of confidentiality. Students who were not comfortable with the study were given the opportunity to voluntarily opt out.

2.5 Data processing and analysis

Data entry and analysis was carried out in SPSS version 22.0. Chi-square test was carried out to assess the statistical association between socio demographic characteristics such as gender, department, and level of study, and the frequency of food label use.

3. Results

3.1 Overall response

Demographic characteristics showed that majority (96%) of respondents were within the age range of 18 to 29 years, while 6 and 2 respondents, respectively, were above 30 years and below 18 years (Table 1). Also, more than half (55%) of the respondents were males. Among the different programmes of study, the highest (23.5) and least (4.5%) number of respondents were from Clinical Nutrition and Dietetics, and Sports Science, respectively, while students in the second year of study (level 200) participated more in the study (36%) compared to the other year groups (Table 1).

Information about usage of food labels show that less than 30% of respondent always use food labels, while about 11% never use food labels (Table 2). Most of the respondents (91.5%) were aware that packaged foods have labels although 28% do not consider these labels when purchasing food. Additionally, 88% of the respondents revealed that food labels can be helpful at the time of purchasing pre-packed foods.

According to 73.3% of the respondents, the most important information on a food label is the expiry date (Table 3), while information on ingredients was considered important by 19.2%. Information on the weight/volume of product was not considered important by any of the respondents, while the method of preparation, name of producer and brand name were considered important by 1.7, 0.8, and 5.0% of the respondents, respectively.

About 61.6% of the respondents read food labels for health reasons, 17.7 and 12.1% read due to concerns with food allergies, and taste and flavour, respectively, while only 8.6% read labels to know the content of the product. The major reason why the respondents may not refer to food label is related to time wasting (52.7%), although getting confused (19.8%) and not knowing how to use information on food labels (17.4%) were also observed (Table 3).

With respect to nutritional knowledge (Table 4), about 69.5% of respondents answered correctly the question on what constitutes a balanced diet, although 3.5% said they did not know what constitutes a balanced diet. Additionally, 85.5% of the respondents had an idea how a balanced meal can be achieved, although only about 52% of the respondents know the major nutrients needed by the body.

3.2 Influence of gender on food label use and nutritional knowledge

The usage of food labels among the respondents show that 32.91 and 28.15% of females and males, respectively, used food labels always, while 6.33 and 14.56% do not use food labels

(Table 5). Chi-square test revealed no significant effect of gender on the use of food labels. Also, more than 85% of both genders were aware that packaged foods have labels, although about 27% do not consider these labels when purchasing food. Additionally, 17.78 and 7.27% of females and males, respectively, do not consider labels helpful when purchasing food.

With respect to the nutritional knowledge of the respondents, 74.44 and 65.45%, respectively, of females and males know the minimum requirement to achieve a balanced diet, while more than 85% of both gender have an idea about what to consume to achieve a well-balanced diet. On the contrary, only 47.78 and 55.45% of females and males, respectively, know the major nutrients needed by the body (Table 5).

3.3 Influence of programme of study on food label use and nutritional knowledge

The frequency of food label among the different programmes of study show that majority of students use food labels intermittently (Table 6). Students of Diagnostic Medical Sonography reported the highest percent for never using food labels (27.78%), while Sports Science students had the highest for always using food labels (44.44%). Majority of students (>70%) were aware that packaged foods had labels and considered them helpful, with more than 50% considering the information of food labels prior to purchasing.

More than 70% of students in Clinical Nutrition and Dietetics, Biomedical Sciences, Physician Assistant and Sports Science knew the composition of a balanced diet. A similar observation was also made with respect to knowledge about the of major nutrients needed by the body. Also, most of the students in the different study programmes knew how a balanced diet can be obtained (Table 6).

3.4 Influence of level of study on food label use and nutritional knowledge

Among the different levels of study, 41.67% of level 400 students always use food labels compared to 23.08, 26.15 and 39.02% of levels 100, 200 and 300, respectively. (Table 7). While level 400 students recorded the highest for the group who always use food labels (41.67%), the group also recorded the highest among the different levels who never use food labels (16.67%). Chi-square test revealed no significant effect of level of study on the use of food labels. Although, about 90% of the students in the different levels of study were aware that packaged foods have labels, about 35% of levels 100 and 300 students do not consider such labels when buying food, while about 20% of level 200 students do not consider labels helpful when purchasing food.

About 66% of level 100 students know what constitutes a balanced diet (Table 7). This improved to 84.72% for level 200 students, however, a low number of (45.45%) of level 300 students know what constitutes a balanced diet. Similarly, only 68.18% of level 300 students know how a balance meal can be obtained compared to the over 85% of students observed in the other levels of study. Likewise, only 29.54% of level 300 students know the major nutrients needed by the body, compared to the over 55% observed for the other levels of study.

4. DISCUSSION

The current study shows a low usage of food labels among the students, although a high awareness about the presence of food labels on packaged foods was observed. The proportion of students who read food labels is similar to that observed in a similar study carried by Madilo et al. [11]. It has been observed that the lack of understanding of nutritional information is among the major factors limiting the usage of food labels. In a study conducted in Malawi among 60 consumers, only 7.3% were reported to understand the nutritional information on food labels [12]. Also, a study conducted in China reported that only 3.3% of respondents understood nutrition information on food labels [9]. A 2018 study conducted in Bahrain among 430 consumers showed that only 42% actually read and understood the nutrition information on food labels [2]. Also, according to Norazmir et al. [13], about 53.6% of the respondents in Malaysia do not use food labels because they had limited knowledge in nutrition. In this study, however, majority of the students had some knowledge about nutrition, and thus could read and interpret nutritional information on food labels. Hence the low usage of food labels among the students goes to confirm the observation of Quigley and Watts [14] that education level does not influence the usage of food labels by consumers.

Although majority of the respondent considered food labels to be helpful, its usage in making food choices was low. This observation is similar to that made by Song et al. [9], showing that the impact of food labels in food selection is low. This study however, showed that food labels are mostly read for health reasons. According to Vemula et al. [15], women usually read labels to know the content of food packages, especially fats and sugars, as excess consumption of these two ingredients is known to promote weight gain. This shows that gender can affect the use of food labels, although no influence of gender on food label use was observed in this study.

One major reason limiting the use of food labels observed in this study was the perception that reading food labels amounts to time wasting, although concerns with food allergy and the confusing nature of labels was observed. A similar report was made in a study conducted by Jacobs et al. [16]. However, other studies have reported that labels are not read by consumers due to other factors such as poor organization and presentation on packages [17], and their complexity to understand [18]. This implies that labels on food packages should be simplified for easy reading and understanding by consumers.

With respect to the different demographics characteristics, it was observed that neither gender nor level (year) of study had an influence on the frequency of food labels use. A Chi-square test also showed no association between the nutritional knowledge of the students and the frequency of food labels, which affirms the observation of Quigley and Watts [14]. Indeed, a low interest in reading food labels have been observed in other studies carried out in Ghana ([19]; [20]; [11]; [21]). The low usage of food labels among students may have health implications due to the recent increasing demand for pre-packaged foods. The low nutritional content of some pre-packaged foods, coupled with increasing issues of food adulteration means that consumers need to be vigilant to know the content of foods consumed. Hence, educating students and the general populace on the importance and usage of food labels and food choices must be intensified.

5. CONCLUSIONS

Less than a third of the students always refer to food labels when purchasing pre-packaged foods, even though majority of the students are aware that packaged foods have labels. Also, most students do not refer to information on food labels when making purchases. Among the information of labels, expiry date was considered the most important information on pre-packaged foods, while the students may refer to labels mostly for health reasons. Among the factors limiting the use of labels, time wasted reading labels was considered the most prominent. There was no effect of gender, and level of study on the use of food labels, while no association was observed between nutritional knowledge of the students and the use of food labels.

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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288

Tables

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (%)
Age	
<18	2 (1.0)
18-29	192 (96.0)
30 years and above	6 (3.0)
Gender	
Male	110 (55.0)
Female	90 (45.0)
Programme of Study	
Clinical Nutrition and Dietetics	47 (23.5)
Physician Assistant	24 (12.0)
Diagnostic Medical Sonography	18 (9.0)
Diagnostic Imaging Technology	8 (4.0)
Health Information Management	38 (19.0)
Biomedical Sciences	19 (9.5)
Optometry	18 (9.0)
Medical Laboratory	19 (9.5)
Sports Science	9 (4.5)
Level of Study	
100	56 (28.0)
200	72 (36.0)
300	44 (22.0)
400	28 (14.0)

Table 2: Usage of food labels among the respondents.

Variable	Frequency (%)
How often do you read food labels?	
Always	55 (27.5)
Sometimes	107 (58.8)
Never	20 (11.0)
Are you aware that packaged foods has labels?	
Yes	138 (91.5)
No	17 (8.5)
Do you consider labels when buying packaged foods?	
Yes	144 (72.0)
No	56 (28.0)
Are labels helpful when purchasing foods?	
Yes	176 (88.0)
No	24 (12.0)

297 **Table 3**: Factors affecting the usage of food labels

Variable	Frequency (%)
Which information on food labels is the most important to you?	
Ingredients	38 (19.2)
Expiry date	147 (73.3)
Weight/volume of product	0 (0)
Method of preparation	3 (1.7)
Name of Producer	2 (0.8)
Brand name	10 (5.0)
Why do you read food label?	
I experience food allergy	35 (17.7)
For health reasons	122 (61.6)
Concerns on taste and flavor	24 (12.1)
To know the content of the food product	17 (8.6)
Why don't you read food labels?	
I do not know how to use	29 (17.4)
Label is not attractive	15 (9.0)
It is time consuming	88 (52.7)
It is confusing	33 (19.8)
Some beverages don't have labels	2 (1.2)

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302 **Table 4**: Assessing the nutritional knowledge of respondents

Variable	Frequency (%)
A balanced diet contains the following nutrients:	
More proteins and carbohydrates (MPC)	22 (11.0)
Carbohydrates, fats and protein (CFP)	25 (12.5)
Fats, minerals and vitamins (FMV)	7 (3.5)
Carbohydrate, fats, protein, vitamins and minerals (CFPVM)	139 (69.5)
Don't Know (DK)	7 (3.5)
You can consume a well-balanced diet by eating:	
A lot of foods (LF)	14 (7.0)
Expensive foods (EF)	6 (3.0)
A lot of meat (LM)	4 (2.0)
A variety of foods (VF)	171 (85.5)
Cheap but delicious foods (CDF)	5 (2.5)
What are the major nutrients needed by the body?	
Carbohydrates, vitamins and minerals (CVM)	34 (17.0)
Carbohydrates, protein and fats (CPF)	104 (52.0)
Vitamins and minerals (VM)	15 (7.5)
Carbohydrates and Protein (CP)	18 (9.0)
Protein, vitamins and minerals (PVM)	29 (14.5)

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Table 5: Effect of Gender on Food label use and nutritional knowledge.

Gender	Question/Response/Frequency				
	How often do you read nutrition labels?				
	Always	Sometimes	Never		
Female	26	48	5		
Male	29	59	15		
	Are you aware that packaged foods have labels?				
	Yes	No			
Female	77	13			
Male	106	4			
	Do you consider labels when buying packaged foods				
	Yes	No			
Female	66	24			
Male	78	32			
	Are labels helpful when purchasing foods?				
	Yes	No			
Female	74	16			
Male	102	8			
	A balanced diet contains the following nutrients				
	MPC	CFP	FMV	CFPVM	DK
Female	9	5	4	67	5
Male	13	20	3	72	2
	You can consume a well-balanced diet by eating				
	LF	EF	LM	VF	CDF
Female	8	2	0	76	4
Male	6	4	4	95	1
	What are the major nutrients needed by the body?				
	CVM	CPF	VM	CP	PVM
Female	18	43	7	5	17
Male	16	61	8	13	12

Table 6: Effect of Programme of Study on Food label usage and nutritional knowledge.

Programme of study	Question/Response/Frequency		
	How often do you read nutrition labels?		
	Always	Sometimes	Never
Clinical Nutrition and Dietetics	2	13	1
Physician Assistant	18	23	3
Diagnostic Medical Sonography	0	8	0
Diagnostic Imaging Technology	4	9	5
Health Information Management	15	16	7
Biomedical Sciences	3	10	0
Optometry	1	10	1
Medical Laboratory	8	13	3
Sports Science	4	5	0
	Are you aware that packaged foods have labels?		
	Yes	No	
Clinical Nutrition and Dietetics	19	0	
Physician Assistant	46	1	
Diagnostic Medical Sonography	8	0	
Diagnostic Imaging Technology	18	0	
Health Information Management	32	6	
Biomedical Sciences	19	0	
Optometry	13	5	
Medical Laboratory	19	5	
Sports Science	9	0	
	Do you consider labels when buying packaged foods		
	Yes	No	
Clinical Nutrition and Dietetics	15	4	
Physician Assistant	40	7	
Diagnostic Medical Sonography	1	7	
Diagnostic Imaging Technology	12	6	
Health Information Management	22	16	

Biomedical Sciences	14	5			
Optometry	10	8			
Medical Laboratory	21	3			
Sports Science	9	0			
	Are labels helpful when purchasing foods?				
	Yes	No			
Clinical Nutrition and Dietetics	16	3	19		
Physician Assistant	43	4	47		
Diagnostic Medical Sonography	8	0	8		
Diagnostic Imaging Technology	18	0	18		
Health Information Management	34	4	38		
Biomedical Sciences	12	7	19		
Optometry	14	4	18		
Medical Laboratory	22	2	24		
Sports Science	9	0	9		
	A balanced diet contains the following nutrients				
	MPC	CFP	FMV	CFPVM	DK
Clinical Nutrition and Dietetics	0	10	0	9	0
Physician Assistant	0	5	2	40	0
Diagnostic Medical Sonography	3	0	1	4	0
Diagnostic Imaging Technology	0	0	0	18	0
Health Information Management	8	7	0	21	2
Biomedical Sciences	4	0	2	13	0
Optometry	0	1	2	10	5
Medical Laboratory	7	0	0	17	0
Sports Science	0	2	0	7	0
	You can consume a well-balanced diet by eating				
	LF	EF	LM	VF	CDF
Clinical Nutrition and Dietetics	2	0	0	16	1
Physician Assistant	2	0	0	43	2
Diagnostic Medical Sonography	1	0	0	7	0
Diagnostic Imaging Technology	0	0	0	18	0

Health Information Management	4	4	4	26	0
Biomedical Sciences	3	2	0	12	2
Optometry	0	0	0	18	0
Medical Laboratory	0	0	0	24	0
Sports Science	2	0	0	7	0
	What are the major nutrients needed by the body?				
	CVM	CPF	VM	CP	PVM
Clinical Nutrition and Dietetics	5	5	0	6	3
Physician Assistant	3	39	0	1	4
Diagnostic Medical Sonography	1	5	0	0	2
Diagnostic Imaging Technology	5	9	0	1	3
Health Information Management	10	9	9	3	7
Biomedical Sciences	4	6	2	4	3
Optometry	3	7	4	0	4
Medical Laboratory	3	16	0	2	3
Sports Science	0	8	0	1	0

Table 7: Effect of Level of Study on Food label usage and nutritional knowledge.

Year of Study	Question/Response/Frequency				
	How often do you read nutrition labels?				
	Always	Sometimes	Never		
100	12	33	7		
200	17	43	5		
300	16	21	4		
400	10	10	4		
	Are you aware that packaged foods has labels?				
	Yes	No			
100	50	6			
200	67	5			
300	39	5			
400	27	1			
	Do you consider labels when buying packaged foods				
	Yes	No			
100	36	20			
200	56	16			
300	29	15			
400	23	5			
	Are labels helpful when purchasing foods?				
	Yes	No			
100	51	5			
200	59	13			
300	40	4			
400	26	2			
	A balanced diet contains the following nutrients				
	MPC	CFP	FMV	CFPVM	DK
100	7	9	1	37	2
200	2	3	3	61	3
300	11	9	2	20	2
400	2	4	1	21	0
	You can consume a well-balanced diet by eating				
	LF	EF	LM	VF	CDF
100	2	0	0	53	1
200	5	0	0	64	3
300	4	6	4	30	0
400	3	0	0	24	1
	What are the major nutrients needed by the body?				

	CVM	CPF	VM	CP	PVM
100	9	30	1	4	12
200	12	40	3	12	5
300	9	13	11	1	10
400	4	21	0	1	2