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Original Research Article

Survey on Consumer Knowledge and Use of Food Labels

Sathyasurya Daniel Robert[1*], AkshayChandran[*]

[1]A. Professor,
[*]Department of Nutrition and Dietetics, Dr.NGP Arts and Science College, Autonomous and Affiliated to Bharathiar University, Dr. N.G.P. Nagar - Kalapatti Road, Coimbatore - 641048. India

Corresponding Author: Sathyasurya Daniel Robert

ABSTRACT

The purpose of this study was to investigate the frequency of reading food label and to compare the knowledge, attitude and practice of reading the food label between the residents of Ernakulam and Coimbatore, India. In this cross-sectional survey, 200 volunteers aged 20- 60 years were asked to complete a questionnaire contained fifteen questions. The Chi-Square test was applied to examine the study data. The results show that only 5% of the total participants had adequate knowledge in reading food labels. There was no association between education level and knowledge of food label reading ($\chi 2$=0.897, df=1, P=0.344). But the consumers education level was significantly associated with the frequency of food label reading ($\chi 2$=5.170, df=1, P = 0.023). About 19% of the participants totally agreed that the information that was provided on the food label was important. The study showed that 46% of the total participants frequently read the food labels. Ninety percent of the participants stated that they don't buy the food products without food label and it was found that only 19% of the total participants calculate their food intake based on the information provided on the food label. Participants of this study had low level of knowledge regarding the nutrition information that was provided on the food label.

Keywords: Food; Label; Nutrition; Consumer; Information; Knowledge; Understanding

INTRODUCTION

Chronic disease conditions such as diabetes mellitus, cardiovascular diseases and heart disease have been reported to be among the leading cause of death and disability in developing nations. [1] One of the major causes for getting these chronic diseases is due to poor selection of foods. Diets specifically high in saturated fats, high in salt and low in fruits and vegetables have been associated with increased morbidity and mortality from these conditions. [2] The reading and understanding of nutrition information on food packages has been shown to improve food choices and instill healthy eating habits in individuals. [3-5] Nutrition labelling is information found on the labels of prepackaged foods. Food labels give information about the nutritional value of a food. People can use this information to make healthier food choices and achieve overall good health. [6] In most countries food labelling is subject to regulations. These regulations prevent false advertising and assist in promoting food safety. A nutrition panel on a food label is required on all packaged foods in most countries. In India, food labelling is governed by the Food Safety and Standards Act, 2006 (34 of 2006). Previously, packaged foods sold in Indian markets were labelled only with the product name, manufacturer's name and address, amount of product in the package, its ingredients and date of expiry. But presently, nutrient content declaration has been made mandatory on all pre-packaged

foods. [7] According to the recent regulation, information on the following nutrients has to be displayed : per serving or 100 g/ml of food: energy (kcal); carbohydrate (g); total sugars (g); added sugar (g); total fat (g) including saturated fat (g); trans-fat (g); and cholesterol (mg). Indian consumers can now get more nutrition information about prepackaged food products due to expanded food labelling mandated by the Government of India.

Even though growing scientific evidence show that food labels will encourage healthy eating, increasing results from research findings show that mere display of food labels cannot help consumers make informed choices particularly in developing countries. [8] In a prior study the results showed that consumers who are well educated had a low understanding about the information provided on the food labels. It was also noted that advertisement and prices were seen to be the key factors that influence purchasing decision. [9]

In another finding it was noted that the nutrient information displayed on the labels was too technical to understand by the educated consumers. [10] As the prevalence of overweight, obesity and chronic diseases are on the raise among the Indian population, [11–14] the possible effect of food labels in discouraging selection of unhealthy foods needs to be investigated. In addition there are very few studies in India that have looked into consumer knowledge, perceptions and practices pertaining to the use of food labels for making food choices. A recent study conducted by the National Institute of Nutrition, India on the current scenario of food labelling in the country reiterated the need for nationwide studies to understand consumers' knowledge and practices related to food labels for formulating strategies to make them user-friendly. [7] As there are no prior studies done to determine the knowledge, attitude and practice of food labels among the consumers living in Coimbatore and Ernakulam, India, the aim of this study was to determine the knowledge, attitude and the practice of using food labels among the educated adults of Coimbatore and Ernakulam, and to compare the results between the two regions.

MATERIALS AND METHODS

The research was conducted as a cross sectional survey in Coimbatore and Ernakulam, India. The study included respondents from supermarkets in Coimbatore and Ernakulam. Respondents were approached at random as they exited from the stores. Informed consent was obtained from respondents before undertaking the study. A non-probability, convenience-sampling technique was used to recruit 200 volunteers (100 in Coimbatore and 100 in Ernakulam) for this study. Data were collected through a modified questionnaire developed based on questionnaires used reliably in previous studies. The questionnaire was administered to respondents, and assessed the use and understanding of food labels. It consisted of 4 sections. Section A assessed the demographic characteristics of the respondent. Section B examined respondent's knowledge on food labels. Section C investigated the attitude of the respondents and section D assessed the respondent's use of food labels.

Participants

The study participants were male or female adults aged between 20 – 60 years of age who could able to read and understand English.

Statistical Analysis

Data entry and analyses were performed using Microsoft excel spread sheets and SPSS version 17 (SPSS Inc. Chicago, IL, USA). Descriptive statistics and Chi square test were generated to describe the findings. Incomplete questionnaires were discarded.

RESULTS

Participants' characteristics

A total of 200 individuals participated in the survey. The majority of respondents were males (n=141). The

general characteristics of the study participants are presented in Table 1.

Table 1. General characteristics of participants

	Ernakulam (n)	Coimbatore (n)
Gender		
Male	75	66
Female	25	34
Age (Years)		
20-30	64	79
30-40	10	17
40-60	26	4
Educational qualification		
Primary or below	2	1
Secondary	11	7
Undergraduate	59	45
Masters and above	28	47
Occupation		
Employment	19	13
Business	11	14
Self employed	9	22
Unemployed	14	4
Student	47	47
Income per month		
Rs 5000-10,000	4	10
10,000-20,000	13	17
20,000 and >	24	23
Nil	59	50
Height (meters)*		
Male	1.67±0.06	1.63±0.10
Female	1.57±0.09	1.59±0.09
Weight (kg)*		
Male	70.62±10.60	66.10±12.65
Female	57.08±11.22	56.47±10.24
BMI (kg/m^2)*		
Male	25.28±4.20	24.61±3.65
Female	23.18±4.71	22.06±3.08

*Mean ± SD

Most of the (72%) participants were 20– 30 years old. Of those who completed the questionnaire higher numbers (52%) were educated to a undergraduate level or above. Anthropometric data showed that the mean BMI of the female and male respondents in Ernakulam was 23.2±4 and 25.3± 4 respectively. Whereas the mean BMI of the female and male respondents in Coimbatore was 22.1±3 and 24.6±3 respectively.

Consumer's knowledge of food label

To assess the consumer's knowledge regarding food labels, respondents were shown sample food labels and were asked to choose the correct answers. The questions that were asked and the answers given by the respondents are indicated in table 2.It was noted that only 4% of the total respondents gave correct answers. Pearson's Chi square test was done to check the association between education and score obtained by the respondents. It was found that there was no association ($\chi 2=0.897$, df=1, P=0.344) between education and knowledge level of the respondents.

Table 2 Knowledge related questions and the frequency of right and wrong answers

	Frequency	
	Ernakulam (n=100)	Coimbatore (n=100)
1.Calorie consumed if you eat all the macaroni and cheese?		
Correct Answer	7	8
Incorrect answer	93	92
2. Milk with fewer calories		
Correct Answer	76	84
Incorrect answer	24	16
3. Better food for heart disease		
Correct Answer	90	78
Incorrect Answer	10	22
4. Total dietary fiber content of the following food		
a. Correct Answer	4	5
b. Incorrect Answe	96	95
5. The following type of food is beneficial to individuals who are		
a. Correct Answer	42	27
b. Incorrect Answer	58	73
Total number of participants who got all correct answers	2	5

Consumer's attitude towards reading food labels

Participants were asked whether the nutrition information that is provided on the food labels was useful, important and true. Even though majority (50 %) of the participants reported neutral answers, 15 % of the total participants totally agreed that the nutrition information was helpful, vital and that it can be trusted. We also found that 24 % of the participants partially agreed and 7 % of the participants totally agreed that

the information provided by the food labels were confusing. Expiry date (27 %) and price (12%), was found to be the information consumers most seek on any prepackaged food. However most (49%) of the respondents think that all the information (price, expiry date, ingredients and nutrition information) that is provided on the food label is important. Table 3 shows the participants perception of food label. Pearson Chi-Square test showed there was no association between consumers education and the importance given to food label ($\chi 2$= 1.017, df=1, P = 0.313).

Table 3 Consumer's perception of food label

	Frequency	
	Ernakulam (n=100)	Coimbatore (n=100)
1.The nutritional information on food package help me to purchase the food		
a. Totally agree	24	11
b. Partially agree	32	15
c. Neutral	40	66
d. Partially disagree	5	7
e. Totally disagree	0	1
2. The nutrition information on the food package can be trusted		
a. Totally agree	14	3
b. Partially agree	35	27
c. Neutral	43	60
d. Partially disagree	5	8
e. Totally disagree	3	2
3. Information that is provided on the food nutrition label is important		
a. Totally agree	17	21
b. Partially agree	29	36
c. Neutral	48	38
d. Partially disagree	6	5
e. Totally disagree	0	0
4. I feel the information provided on the food label is confusing.		
a. Totally agree	10	4
b. Partially agree	29	18
c. Neutral	44	66
d. Partially disagree	15	9
e. Totally disagree	2	3
5. Which do you think is very important in a food label?		
a. Price	15	9
b. Expiry date	33	21
c. Ingredients	6	5
d. Nutrition information	4	9
e. All the above	42	56

Consumer's use of food label

Table 4 presents participants use of food labels while buying prepackaged foods. It's been found that 46% of the total participants read the food labels regularly before buying the food products.

Although 46% of the consumers claim that they read all the information such as serving size, nutrient content, price, expiry date and ingredients, 27 % of the consumers read only the expiry date and about 16% of the participants read only the price before buying the food products. Almost 90% of the participants indicated that they don't buy the food product without food label. In addition about 19% of the participants reported that they calculate their food intake using the nutrient information provided on the food label. Pearson's Chi square test showed that there was no association between income of the consumers and the price that is indicated on the food label ($\chi 2$=0.443, df=1, P= 0.505). However there was a significant association ($\chi 2$=5.170, df=1, P = 0.023) between frequency of reading the food label and the educational level of the respondents. It was also noted that there was a significant association ($\chi 2$=6.259, df=1, P=0.012) between the body mass index and calculation of food intake based on the food label. Over weight consumers tend to use the food label more often than the normal weight participants.

Table 4 Consumer's use of food labels

	Frequency	
	Ernakulam (n=100)	Coimbatore (n=100)
1.How often do you read food labels		
a. Regularly	29	62
b. Sometimes	67	38
c. Never	4	-
2. What will you read from the food label		
a. Serving size	-	6
b. Nutrition content	4	11
c. Price	22	10
d. Expiry date	31	23
e. Ingredients	2	-
f. All the above	41	50
3. Based on the information provided on the food label, will you choose the food product?		
a. Yes	72	83
b. No	28	17
4. Will you avoid buying the food, if there is no food label?		
a. Yes	86	93
b. No	14	7
5. Do you calculate your food intake on the food label?		
a. Yes	11	27
b. No	89	73

DISCUSSION

This study has revealed that knowledge of pre-packaged food labelling information was low among consumers in Ernakulum and Coimbatore, India. It was also observed that less than half of the total respondents frequently read the food labels. Similar studies worldwide have reported that consumers were not knowledgeable with the terminology on the food labels. [15-20] A recent study found that only 17% of the shoppers read food labels, and understanding of nutrition information was limited. [16] Our findings showed that the education level of the respondents was not significantly associated with the knowledge about food labels. However the education level of the respondents was significantly associated with the frequency of food label reading. Although the education level of the consumers was high, they don't have enough knowledge level to interpret the food label. Thus an additional guidance from a qualified dietician is required to guide them to read the food label. This will help them to calculate the food intake and to select the food according to their needs. The frequency of reading food labels by the educated people was more when compared with that of the low educated respondents. They were able to interpret the food label to a certain extent and thus were able to choose the food products according to their needs. Earlier research studies done in India and other countries have found that there was a direct relationship between the education level of consumers and their habit of checking food labels. Educated consumers check food labels more frequently than their illiterate counterparts. [21-24] Results from this study indicated that most of the consumers claim that they read all the information such as serving size, nutrient content, price, expiry date and ingredients before buying the food products. However, the consumers were concerned more about the expiry date of foods. In India, food adulteration is a major concern. According to the Ministry of Health and Family Welfare report, it is estimated that about 11 % of all foods sold in India are adulterated. [25] Most of the respondent's in this study preferred food labelling even though they might not understand the complete information provided on it. Food label is preferred as a sign of trust by most of the consumers. Without food label people consider the food not acceptable for consumption. Few participants of this study replied that they do not rely on the food labels before purchasing the food products. Furthermore from this study it was noted that certain consumers were confused to the information that was provided on the food labels. This might be because of the font size or the use of more complicated terms in

the food label that make the consumers unable to follow the information provided on it. Hence efforts have to be taken to help the consumers in interpreting the information that is provided on the food label.Since food manufacturing companies spend considerable amount of money on product labels, it was important for them to know the way labels influence purchasing decision of the consumers. They should therefore conduct research periodically to know how consumers perceive the food label they read and those of keen interest in order to elaborate them. In addition qualified dietitians must as well guide the consumers in interpreting the food label. Another vital finding from this study is that there was a significant ($\chi 2=6.259$, df=1, P=0.012) association between the body mass index and calculation of food intake based on the nutrient information provided on the food label. The respondents who are overweight use the food label in calculating their food intake were higher than the respondents who have normal body weight. This proves that overweight people are more concerned in maintaining their body weight when compared to those with normal body weight.

The limitations in this study are the sample size of 200, which was drawn from 2 regions in India, show the findings are suggestive rather than conclusive. Besides this, the study relied on self-reports to explore participants knowledge, perception and practice of food labels in food stores. Therefore, it is possible that the respondents reported intended rather than actual shopping behaviors. In addition this study focused on adults in the general population, probably at the expense of the adolescents and people who have specific diseases like diabetes mellitus, CVD, cancer and HIV/AIDS. Despite these limitations, the finding of this study has an important public health implication. The low knowledge level of nutrition information among consumers emphasizes the need for nutrition labels to be in simple, familiar and non-technical language so that the majority of consumers can understand what they mean. Further intervention studies should be conducted to find out if increasing consumer's nutrition knowledge levels improves understanding of the nutrition information that was provided on the food label.

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