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**Cover letter**

# Assessment of knowledge and understanding among consumers regarding food label reading

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**ABSTRACT**

**Food label reading knowledge and understanding among consumers**

**Background:** Nutrition information on food labels is regarded as a major means for encouraging consumers to make healthier choices when shopping for food. The **FDA** announced the new Nutrition Facts label for packaged foods to reflect new scientific information, including the link between diet and chronic diseases such as obesity and heart disease.

**Aim:** The purpose of this study was to assess the frequency of food label use among the consumers and its relationship to nutrition knowledge, and beliefs regarding diet-disease relationships, and to determine factors predictive of infrequent label use.

**Method:** The study surveyed 850 consumers of the city, approached randomly. A verbal consent had been taken from the consumers before giving them questionnaire. A pre-tested questionnaire was used to collect data for analysis and interpretation. The questionnaire was formulated based on questionnaires validated and used reliably in previous studies.

**Result:** About 40% consumers buy the pre packed foods once weekly. Taste, brand name, convenience and habit are the main reason for buying pre packed foods. Although majority of consumers across the age groups read the food labels, but majority looked only for the sign of vegetarian or non-vegetarian (70%) and manufacturing and expiry date (85%). Of those who read labels, only a third checked nutrition information and ingredients.

**Conclusion:** Nutrient information on labels was not often read because most consumers either lacked nutrition knowledge or found the information too technical to understand. The intention of promoting healthy food choices through use of food labels will not be completely met till people found it difficult to comprehend nutrition information.

**Key words:** Nutrition information, food label, knowledge and understanding, diet-disease relationship.

## INTRODUCTION

The disease burden from non- communicable disease (NCD's) is rapidly increasing in India. Diet related chronic disease such as diabetes mellitus, cardiovascular diseases and heart disease have been reported to be among the leading cause of death and disability in developing countries[1]. An important modifiable factor that can reduce the prevalence of NCDs is the reduction of overweight and obesity[2]. An associated cause of overweight and obesity is the poor food choices.

The development of global supermarkets is bringing a plethora of new pre-packaged foods to the developing nations. Many consumers discover these foods displayed in stores, but they cannot taste or smell the products before purchase.

Food labeling is one of the important population- based approaches that can help consumers make healthy food choices by providing the necessary information about the food on the packaging[3]. The food label is one of the most important and direct means of communication of product information between buyers and sellers.[4,5] Ideally, for consumers, food labels are tools to make informed and healthy choices. Food labels can also be viewed as potentially powerful tools of nutrition communication.[6]

Therefore, consumers have more nutrition information due to expanded food labeling mandated by the Government of India. Food labeling laws make sure that consumers get vital information about the food they consume. As per food laws globally, every pre packed food has to be labeled, and should comply with the law applicable in the country of the user. In India, the Food Safety and Standards Authority of India (FSSAI) is the apex food regulator, and every pre-packaged food should be in accordance with the Food Safety and Standards (Packaging and Labeling) Regulations, 2011, notified by the FSSAI.

While there is no doubt that food labels will encourage healthy eating, there is increasing evidence from developed countries (where food labeling is more evolved) indicating that mere display of food labels cannot help consumers make informed choices.[7]

A recent study conducted by the National Institute of Nutrition, India on the current scenario of food labeling in the country concluded that food labeling regulations in India are on a par with those of developed countries; however, the concept of displaying nutrition information in relation to RDA is not mandated. Moreover, the study also concluded that there is hardly any research examining the knowledge, practices and use of food labels by Indian consumers.[8] The study also reiterated the need for nationwide studies to understand consumers' knowledge and practices related to food labels for formulating strategies to make them user-friendly.

Given this background, the present study was conducted with the objective to assess the knowledge, perceptions and practices related to use of food labels among consumers of different age groups.

## METHODS AND MATERIAL

### Data collection

A cross sectional random sampling study was designed to collect the data. The data were collected from Indore city irrespective of gender and age group of the samples.

### Questionnaire design

Data were collected through the structured questionnaire developed based on questionnaires used reliably in previous studies. The questionnaire was administered to the respondents, and assessed the use and understanding of food labels. This questionnaire elicited information from respondents on

demographic characteristics (gender, age, education, profession, family type, etc.) as well as data on important considerations while buying pre-packaged foods, frequency of checking labels and food-related information sought from labels (like nutrition facts, ingredients, quality symbols, etc.).

**Data analysis**

The data were scrutinized and checked for consistency before being entered on a computer. The statistical software package SPSS Statistics for Windows version 21.0 was used for analysis of data. Descriptive statistics like percentages, frequency distribution as well as cross-tabulations were done and the $X^2$ test was used to assess the significance of associations between variables. Incomplete questionnaires were not used in the final analysis.

## RESULTS

### SECTION A

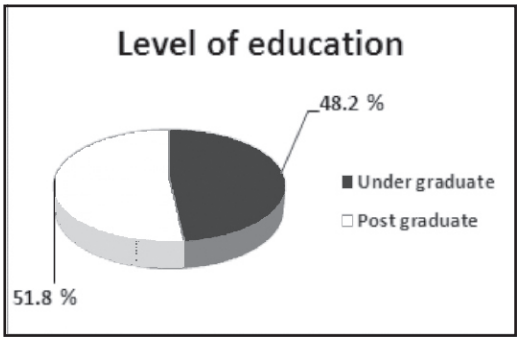
**Table 1: Socio demographic characteristics of the respondents**

A total of 838 individuals participated in the survey. About two third 69% participants were male. Consumers younger than 20 years or older than 50 years constituted the least groups of shoppers. The average age of the samples was 36 years. With regard to education level, 48.2% respondents were under graduate whereas 51.8% were post graduate.

- **Socio demographic characteristics of the respondents**

| | |
|---|---|
| **Total no of subjects (N)** | **838** |
| Age | 36.69 ± 10.5 |
| Gender | |
| Male | 61% |
| Female | 39% |
| Level of Education | |
| Under Graduate | 48.2% |
| Post Graduate | 51.8% |

**Figure 1: Percentage prevalence of education level**




### SECTION B

**Table 2: Food label reading characteristics**

- **Food label reading characteristics**

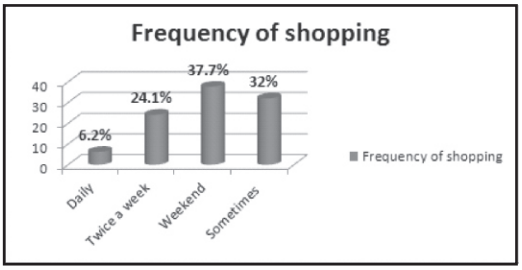
| Characteristics | Percentage % |
|---|---|
| Frequency of shopping | |
| Daily | 6.2% |
| Twice a week | 24.1% |
| Weekend | 37.7% |
| Sometimes | 32% |
| Consumers carrying shopping list | |
| Yes | 28.1% |
| No | 71.9% |
| Motivation to buy food products | |
| Appearance | 8.3% |
| Brand name | 21.9% |
| Convenience | 5.2% |
| Habit | 9.3% |
| Nutritional information | 9.3% |
| Price | 11.4% |
| Taste | 34.3% |
| Consumer's knowing what food label is? | |
| Yes | 22.4% |
| No | 37.2% |
| Little bit | 40.3% |
| Do consumers use food label information while shopping? | |
| Yes | |
| No | 11.2% |
| Sometimes | 61.8% |
| | 26.% |
| Do consumers check sign of veg and nonveg? | |
| Yes | 54.9% |
| No | 27.7% |
| Sometimes | 17.4% |

| Characteristics | Percentage % |
|---|---|
| Reading standards of purity marks? | |
| Yes | 28.1% |
| No | 52.7% |
| Sometimes | 19% |
| Manufacturing date | |
| Yes | 40.5% |
| No | 40% |
| Sometimes | 19.3% |
| Expiry date | |
| Yes | 42.4% |
| No | 36.7% |
| Sometimes | 20.7% |
| Read food ingredients | |
| Yes | 24.5% |
| No | 52.5% |
| Sometimes | 22.9% |
| Read serving size | |
| Yes | 16.9% |
| No | 63.2% |
| Sometimes | 19.8% |
| Read health claims | |
| Yes | 17.4% |
| No | 64.4% |
| Sometimes | 18.1% |
| Read instructions of use | |
| Yes | 27.9% |
| No | 55.1% |
| Sometimes | 16.9% |
| How much you understand food label | |
| Mostly | 4.3% |
| Partly | 37.9% |
| Don't understand | 57.7% |
| What nutrition information you read on label? | |
| Calories | 15.3% |
| Protein | 20.2% |
| Fat | 18.1% |
| Carbohydrate | 5.7% |
| Sodium | 2.8% |
| Cholesterol | 5.5% |
| None | 28.4% |
| Any other | 3.8% |

- **Frequency of shopping**

A majority of the participants 37.7% tend to do their shopping on weekends followed by 32% and 24.1% consumers who buy any food product occasionally and twice a week, respectively. Only 6.2% consumers buy some or the other food product on daily basis. Here the food products include ready to eat food items to tinned and canned foods.

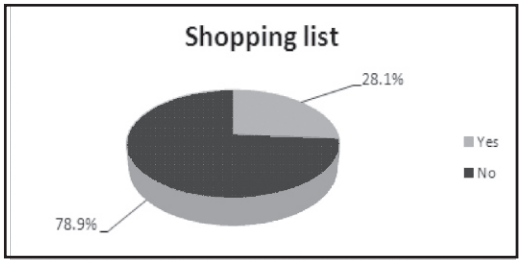
**Figure 2: Percentage prevalence of frequency of shopping**




- **Carrying shopping list**

Majority of the participants 71.9% claimed that they don't use the shopping list before buying food products. Only 28.1% consumers' purchases food as per the pre decided list.

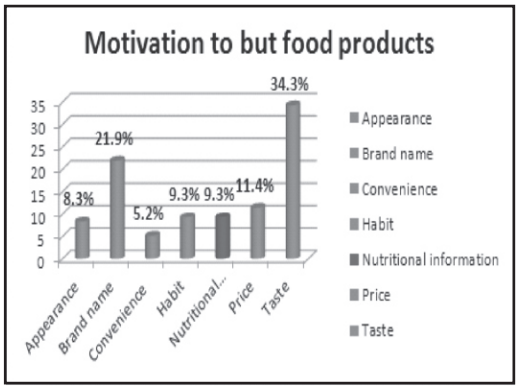
**Figure 3: Percentage prevalence of carrying shopping list**




- **Motivation to buy food products**

Less than one tenth of the participants (9.3%) indicated that nutrition information on food labels, rather than price, taste, appearance, habit, convenience, or brand name, was their main motivator to purchase foods. About one third (34.3%) of the participants based their food choices on taste followed by price (11.4), brand name (21.9%), habit of particular food product (9.3%), appearance (8.3%) and convenience of buying (5.2%).

**Figure 4: Percentage prevalence of motivation to buy food products**




- **Knowledge of food label and its implementation**

With regard to food label knowledge, a majority of the participants 40.3% said they knew little bit about them, whereas 37.2% consumers were unaware about food label. The same trend has been observed with respect to use of food label information when shopping, where only 11.2% claimed that they utilize that knowledge when shopping. While 61.8% consumers doesn't use them

**Figure 5: Percentage prevalence of knowledge of food label**

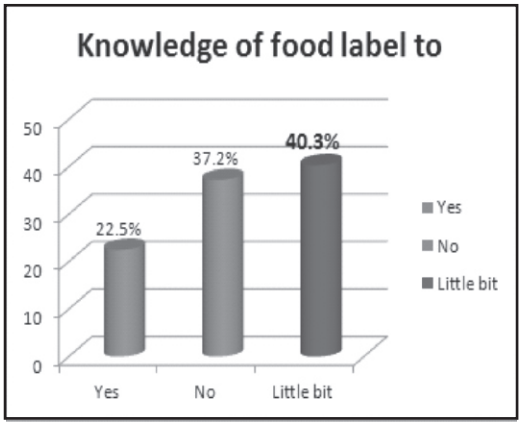
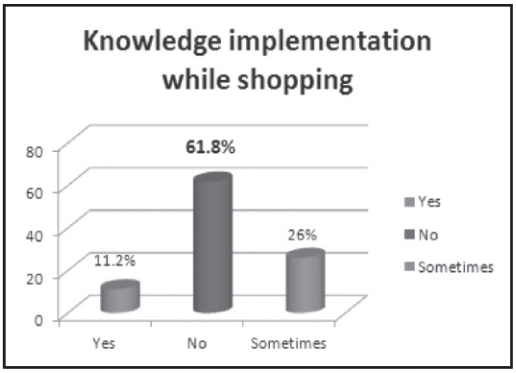



**Figure 6: Percentage prevalence of implementation of food label knowledge while shopping**




- **Factors considered when purchasing a food product**

Half of the consumers 54.9% check the sign of vegetarian and non vegetarian, while 40% consumers check manufacturing and expiry date on food labels before purchasing.

52.7% consumers don't check the purity markers like ISI, FASSI, FPO, etc while purchasing the food products. 52.5% consumers don't read the ingredients on food products; while 63.2% consumers don't measure the serving choice of food products while preparation the food. 64.4% consumers don't read the instruction of use or instruction of cooking while storing the food.

**Figure 7(a): Percentage prevalence of factors considered when purchasing a food product**

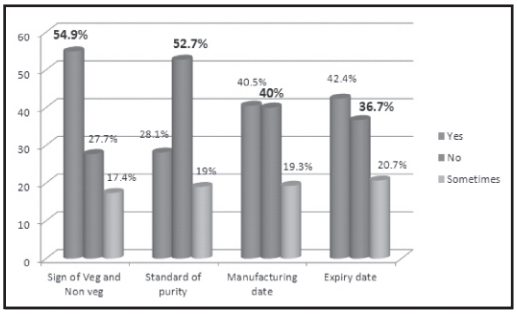
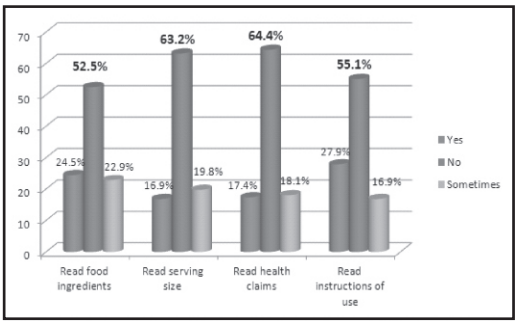


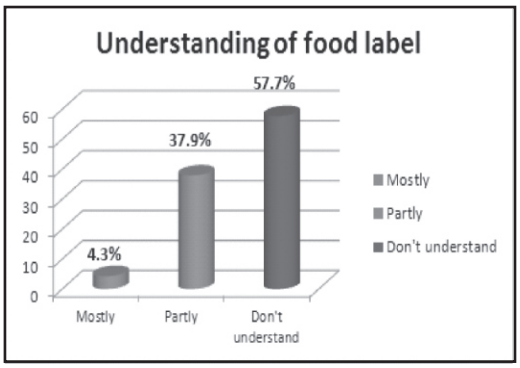
**Figure 7(b): Percentage prevalence of factors considered when purchasing a food product**




- **Understanding of food labels**

Of the label readers, more than half of the respondents (57.7%) claimed to 'don't understand' nutrition labels, while 37.9% reported partial understanding. Only 4.3% respondents claimed to mostly understand the information written on food labels.

**Figure 8: Percentage prevalence of understanding of food label**




- **Nutrient constituents of interest to the label readers**

Nutrient constituent's respondents were interested in protein (20.2%), fat (18.1%), carbohydrate (5.7%), Cholesterol (5.5%), and sodium (2.8%). 28.4% respondents were not interested in reading nutritional content of the food.

**Figure 9: Percentage prevalence of interest of nutrition information reading while shopping**

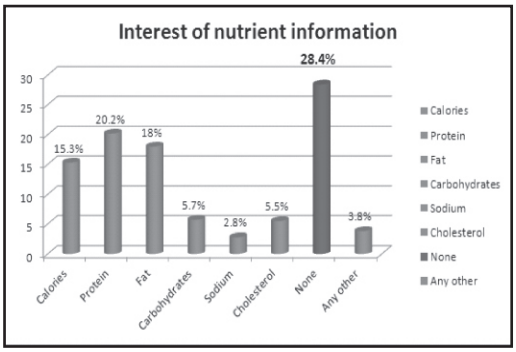



**Table 3: Relationship between consumer's education level and their knowledge of what a food label is?**

There is a significant relationship between the education level and knowledge of food label among under graduate and post graduate consumers ($X^2$ = 21.6, p Value = <0.05)

| Education level | Do you know what a food label is? % | | | $X^2$ | P Value |
|---|---|---|---|---|---|
| | Yes | No | Little bit | | |
| Under graduation | 118 | 144 | 142 | 21.6 | <0.05 |
| Post graduation | 70 | 168 | 196 | | |

**Table 4: Relationship between the knowledge of food label and understanding**

There is a significant relationship between the knowledge of food label and understanding among consumers ($X^2$ = 38.93, p Value = <0.05)

| Do you know what food label is? | How much you understand food label? % | | | $X^2$ | P value |
|---|---|---|---|---|---|
| | Don't understand | Partially understand | Mostly understand | | |
| Yes | 96 | 72 | 20 | 38.93 | <0.05 |
| No | 210 | 96 | 6 | | |
| Little bit | 178 | 150 | 10 | | |

## DISCUSSION

Nutrition information on food labels is regarded as a major means for encouraging consumers to make healthier choices when shopping for food.[9,10] Do consumers notice such labels, do

they read and understand them, and do they make use of them in their purchasing decisions? A range of consumer research studies[11,12,13] have tried to shed light on these questions.

Nutrition information on food labels is an important source of nutrition information but is typically underutilized by consumers. Nutrition information on food labels could be a cost-effective method of communicating nutrition information to consumers because the information appears at the point of sale for most packaged foods.[14] Although consumers value nutrition when deciding which foods to buy[15], nutrition information on food labels is complex and does not always live up to its potential to communicate effectively.[16,17,18,19]

The aim of this study was to find out if consumers, in Indore city, have knowledge of nutrition information on food package labels when shopping and to what extent they use that knowledge to choose foods to buy. The results provide information on consumers' awareness, knowledge and use of food labels, as well as their ability to interpret nutrition information appropriately and make food choices accordingly. These results are expected to help in explaining the reasons that contribute to food choices made by consumers and in coming up with recommendations that will guarantee that consumers are well informed on the nutrition information and can use it whenever they want. Findings of this research could form the basis for a mass population approach for future information and education strategies for health professionals and other stakeholders interested in consumer awareness activities.

As the findings of this study indicate, the majority (71.9%) of the participants claimed that they doesn't use a shopping list, and more than half of them (61.8%) indicated that their choice of specific foods was not based on nutrition information. The same trend has been observed with respect to use of nutrition information when shopping, where only 9.3% claimed that they utilize that knowledge when shopping.

While consumers are checking labels, they do not necessarily understand what they are reading. Half of the world's consumers said they only "partly" understand the nutritional labels on food, with 60 percent of Asia Pacific's citizens leading the world in this lack of understanding, followed by Europeans (50 percent) and Latin Americans (45 percent). In our study 57.7% consumers “Don't understand” the food labels, whereas 39.7% “Partially understand” the food labels information.

A recent study, published in the November, 2006 issue of the *American Journal of Preventive Medicine*, and reported by Douaud [20] showed a significant deficiency in the public's understanding of food labels. In the study, poor label comprehension was correlated with low-level literacy and numeracy skills, but even patients with higher literacy could have difficulties interpreting labels. Not only could these findings point to a need for simpler labels, but they could also add weight to arguments coming from the supplement industry claiming wordy FDA-approved health claims on packaging are too confusing for consumers.[20]

Nutrition labels typically contain information on calories, serving size, and amounts and/or daily values of several macronutrients, vitamins, and minerals (e.g., fats, carbohydrate, and calcium).

In our study 52.5% consumers don't read the ingredients list written in food label. The US Dietary Guidelines 2010 states that: “The ingredients list can be used to find out whether a food or beverage contains synthetic Trans fats, solid fats, added sugars, whole grains, and refined grains.” Ingredient lists contain important nutrition information that can contribute to the consumer's assessment of a food's healthfulness.

The ultimate purpose of nutrition labelling information is to assist consumers in identifying and choosing foods that contribute to a healthy diet. A nutrition labelling education strategy

should, therefore be integrated into broader behavior change strategies related to nutrition education and health to assist consumers in bridging the gap between current dietary practices and dietary recommendations. Information does not lead to behavior change unless it can overcome counteracting psychosocial, behavioral and environmental barriers. The underlying problems include: lack of adequate nutrition education and knowledge, and poor communication to end users.

Despite the limitations, the findings of this study have several public health implications. First, the low use and understanding of nutrition information among consumers stresses 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.

## CONCLUSION

This study found low use and understanding of nutrition labels among consumers in Indore city. Consumers were not conversant with the numeracy, terminology, and language on the current nutrition panel, pointing toward the need for basic nutrition education and user friendly label formats.

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