

Impact of demographic profile on nutritional labelling usage by working women population of Varanasi, India

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Abstract

Nutritional labelling is the nutritional description of the food on the label to help the consumer in food selection. The present study aimed to assess the knowledge, attitude and practices adopted by the subjects and correlate them to have a better understanding of their nutritional background. Nutrition labels are a prominent first-glance article that needs to be very catchy and easy to interpret. The organizations responsible for formulating the rules and regulations must keep them updated and devise new formats of the display to enhance the usage of food labels up to the maximum possible level. A cross-sectional research study on 100 working women of Varanasi, aged between 20-50 years was conducted through a self-structured questionnaire to evaluate their KAP level. In view of the COVID-19 pandemic, the questionnaire was administered to the respondents through the online medium using Google forms. It can be inferred from the study that 58 % of the total respondents surveyed were aware of the labels, 61% of them had a positive attitude towards its usage but only 52% practised healthy shopping more often. About 70% of the participants preferred back-of-pack labelling rather than front-of-pack because the former provides elaborative information. The factors like qualification and occupation of women participants had negative associations with the satisfaction of the display format. The women having knowledge regarding traffic light labelling showed a positive association with the usefulness of the same. The average practice percentage adopted by the consumers had a negative association with factors like qualification, income, and occupation. The need for simplifying the display format and providing basic nutrition information to the population is highlighted in this study.

1. Introduction

Nutrition labels are the labels present on food packages to help the consumers to compare the products, inform them about the nutrients and guide them to make healthy choices. The nutritional labels act as a reliable guide that educates the consumers about the nutritional value of the packed foods (Jadapalli and Somavarapu, 2018). It is a description available to the customers designed with an intention of providing information about the nutritional properties of food. It majorly comprises two aspects: Nutrient Declaration and Nutrition Supplementary Education (Codex Guidelines on Nutrition Labelling, 1993). According to a study by Donga and Patel (2018), nutritional labelling has three key roles: to provide basic product information, to provide health and nutrition information, and to channel food marketing and advertising. Food labels are an

expanded form of nutritional description that forms a bridge between the manufacturers, sellers and consumers. Pre-packaged food products are an imperative choice for the customers of the Indian market, because of certain factors like taste, ease of use, wide range and variety, and ease of availability (Vemula *et al.* 2013). They act as motivational and guiding tools for the consumers to make sensible choices regarding healthy foods (Roberto *et al.*, 2011). Food labels are cost-effective, mandatory aids that promote the ideologies of right eating to foster the aim of a disease-free nation (Campos *et al.*, 2011).

In India, FSSAI in collaboration with the Codex Alimentarius Commission, established by FAO WHO develops standards and guidelines for the effective labelling and packaging of pre-packed foods. FSSAI has a set of guidelines that is to be strictly followed by the

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manufacturers to sell their products without any hindrance from the Government (FSSAI Packaging and Labelling Regulations, 2011). Food Safety and Standards Authority of India (FSSAI) is an autonomous body of the Government of India under the Ministry of Health and Family Welfare that controls all the food packaging, safety, and labelling regulations in the country (Ministry of Health and Family Welfare, 2011). According to the recent regulation, information on the following nutrients must 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) (Robert and Chandran, 2017). Front-of-Pack labelling (FoPL) and Back-of-Pack Labelling (BoPL) are the two broader classifications of nutritional labelling. In India, food products are mainly accompanied by back-of-pack labels as compared to front-of-pack labels. The primary reason behind the popularity of BoPL labels is that they provide elaborate descriptions along with the health logos or QR codes whereas the FoPL labels are mainly text-intensive (Pande *et al.*, 2020).

People nowadays are following a sedentary lifestyle which has made them more lethargic and reluctant. They are exposed to many consequential diseases/disorders occurring due to various environmental, social, psychological, and demographical factors. Diet-related health issues have been at a great surge in the past few years, which has eventually led to the development of chronic diseases among the citizens (Astrup, 2001). Foods which are high in fats and sugars; low in vitamins and minerals degrade the health of the consumers and ultimately cause chronic diseases (Danaei *et al.*, 2009).

The food processing sector in India is following a tremendous growth rate graph which has opened several opportunities in this area for investment and imports and exports. One such field involves broader aspects like food security, packaging and labelling, and quality control. India ranks fifth in terms of food production, consumption and export which makes India a shareholder of about 32% of the global food market. The assessment of consumers' knowledge, attitude and practice regarding food label usage serves as a proxy measure for the public's involvement in ensuring food safety at the utmost level.

The present study was planned and executed to assess the knowledge, attitude and practices of the working women participants and correlate them with certain factors.

2. Materials and methods

It was a cross-sectional study conducted in Varanasi,

Uttar Pradesh, India. A non-probability, convenience-sampling technique was used to recruit 100 working women aged between 20-50 years. Their selection criteria involved working in any organization (private/government sector/self-employed/start-up); having a minimum qualification of 10+2 grade; and who could be able to read and understand English. The exclusion criteria involved responses received from males, women not belonging to the age group of 20-50 years, and non-residents of Varanasi.

A self-structured questionnaire was formulated and distributed to the participants via Google forms. Informed consent was obtained from respondents before undertaking the study and then they were asked to fill out the questionnaire. It consisted of four sections- General information about the women participant, Knowledge examination, Attitude analysis and Practices adopted by them. Some of the questions were extracted from The Food Safety Authority of Ireland (2009), the evaluation report of Food Standards Australia New Zealand (2003) and the American Heart Association Food Labelling Survey (2019). To establish the content validity, the questionnaire had been pre-tested with 10 residents of Varanasi who were quite frequent shoppers of packaged food products. The data was collected from 1st January 2021 to 20th March 2021.

The data obtained was coded in Windows Microsoft Excel 10 and was then imported to the IBM SPSS Version 21.0 for further analysis. Descriptive statistics and Pearson's correlation (r) were generated to have appropriate insights into the concern. Later, the results obtained were recorded in tables and graphs accordingly for better illustration. The association between certain significant study variables were calculated and analyzed to obtain results. Several research papers and review articles were searched to understand the gaps in the previous studies so that the present research can advance in a progressive direction.

3. Results and discussion

3.1 General Information

According to the present study conducted on female working women of Varanasi, 36% (N = 100) of the selected working women did shopping once a week. Similar results were obtained in studies by Vemula *et al.* (2013) and Jain *et al.* (2017).

It was observed through the survey that only 36% (N = 100) of the subjects or their family members were suffering from diet-related issues whereas the other studies conducted by Masoodi and Mubarak (2019) found only 3.92% (N = 51) of the respondents to be diseased and Shine *et al.* (1997) found 32% (N = 200) of

the subjects or their family members to be suffering from some diet-related issues.

The present study found that the younger female participants were more engrossed in labelling usage as compared to older adults. This was also proved by Besler *et al.* (2012) and Manell *et al.* (2006) but was contradicted by Masoodi and Mubarak (2019).

3.2 Knowledge assessment of the participants

According to the survey conducted in Australia and New Zealand, only 16% (N = 1940) of the participants knew about genetically modified foods, while the current study showed 56% positive responses for the awareness of GM foods (FSNAZ, 2003).

In the present survey, when the consumers were asked about the information that is not mandatory on the food packets, according to them, 25% of the total women participants marked 'name of manufacturer or packer or seller' and on similar grounds, the survey conducted by Jadapalli and Somvarapu (2018) observed that only 19% consumers chose the same response (Table 1).

3.3 Attitude assessment of the participants

The topics covered in this section included-interpretation of some common symbols, factors affecting usage of labels, satisfaction level, difficult-to-understand parameters, and the usefulness of traffic light displays. Our findings revealed that 57% (N = 100) of the survey respondents were able to interpret the gluten-free symbol correctly and the rest either were not aware of the symbol or chose incorrect responses.

The present study reported that only 25% of participants in Varanasi had time issues with the use of food labels (Figure 1). These results have been supported by Nurliyana *et al.* (2011), Shine *et al.* (1997), Kim and Kim (2009) and Darkwa (2014) who concluded that time constraints were also one of the reasons for not using nutrition labelling. In a study by Jadapalli and Somvarapu (2018), 28 % (N = 100) of respondents chose time constraints as the primary reason for not using food

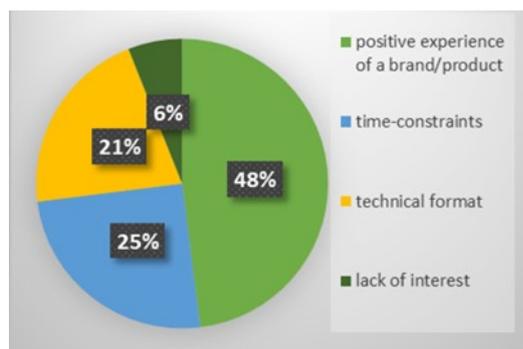


Figure 1. Factors affecting the usage of food labels by the working women participants.

Table 1. Knowledge data of the women participants

Questions	Percentage (%) (N = 100)
Nutrition label meaning	
Yes	80
No	20
Are the labels mandatory?	
Yes	89
No	11
Is FSSAI the controlling authority of food labels in India?	
Yes	68
No	6
Not sure	26
Knowledge about nutrient claim	
Yes	37
No	15
Maybe	48
Knowledge about health claim	
Yes	37
No	15
Maybe	48
Aware of traffic light labelling	
Yes	48
No	25
Maybe	27
Colours of traffic light display	
Yes	66
No	34
The red colour on the label indicates what?	
High amount of nutrient	49
Medium amount of nutrient	5
Low amount of nutrient	9
None of the above	37
Are you aware of Front-of-pack labels?	
Yes	36
No	31
Not sure	33
Are you aware of Genetically modified foods?	
Yes	56
No	44
Identify the food allergen labelling.	
Food additives added	9
No preservatives added	13
Contains artificial flavours	24
May contain nuts and soy	54
Meaning of best before date	
Yes	86
No	14
Mandatory information on the food packet	
Storage instructions	14
Best before date	4
Name of the manufacturer, packer/seller	25
Usage/cooking instructions	24
None of the above	33

labels during shopping and the rest were unable to do so because of the technical terminologies used, presence of false and misleading information and lack of nutrition knowledge. In the study done by Bandara *et al.* (2016), the participants were finding the labels too technical to interpret and that is why they avoided their usage.

3.4 Practice assessment of the participants

Approximately 80% (N = 1832) of the subjects read the 'expiry date' on the packaged foods in the study of Vemula *et al.* (2013) and the current survey showed that 55% of the respondents checked 'best before date' firstly on the packet.

When the respondents of the current study were asked about their habit of reading labels to avoid any particular nutrient, 45% of the total working women affirmed that they always read the labels to avoid a nutritional constituent of the food. While Shine *et al.* (1997) Masoodi and Mubarak (2019) reported a small proportion of the population used the claims often.

Our study findings revealed that about 64% of women participants preferred the use of BoPL rather than FoPL (Table 2). While studies by Kim and Kim (2009) in Korea and Herpen and Trijp (2011) reported ease-of-usage of front-of-pack labelling (FoPL) system.

3.5 Average knowledge, attitude, and practice status

Among the 100 subjects chosen for the study, about 58% (Figure 2) had an average knowledge level while the rest do not have adequate knowledge that they may utilize for healthy shopping. About 61% (Figure 3) of the participants showcased a positive attitude toward using nutrition labels and their related concepts. About 52% (Figure 4) of the total respondents had a significant level of practice while 48% did not practice the usage of nutrition labels in practicality.

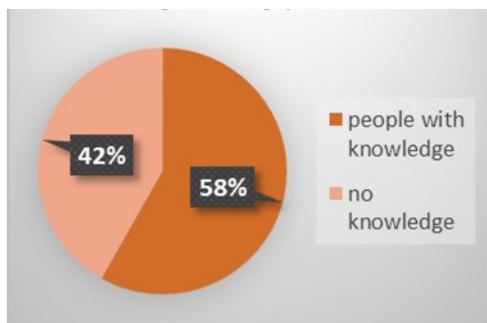


Figure 2. Average knowledge (%) of the working women participants

A similar percentage of respondents has been reported in a study by Buyuktunker *et al.* (2018) and Jain *et al.* (2017). While the study conducted by Masoodi and Mubarak (2019) in Srinagar reported that 82.3% (N = 51) participants respectively practised the use of food

Table 2. Data of practices adopted by the women participants

Questions	Percentage (%) (N = 100)
Frequency of looking for healthier variants	
Always	53
Sometimes	39
Never	8
First parameter that is checked by you	
Sodium	5
Date of expiry	55
Fats	20
Sugar	7
Veg/Non-veg specifications	6
Food additives	7
Class of foods that you check for best before date often	
Infant foods	5
Ready-to-eat packed foods	12
Bakery items	13
Dairy products	24
Grocery items	1
All of the above	45
Most used nutrient claim by you	
Zero added sugar	19
Low calorie	39
Reduced sodium	9
Rich in fibre	33
Most common health claim looked by you	
Instant energy source	4
Strong bones	8
Promotes heart health	44
Lowers cholesterol	44
Do you ever read additional information on the packet?	
Yes	26
No	42
Sometimes	32
Do you ever look at the storage instructions?	
Never	32
Sometimes	31
Always	37
Do you ever use the food label to avoid any ingredient?	
Yes	45
No	27
Sometimes	28
Most preferred display format by you	
FOP	36
BOP	64

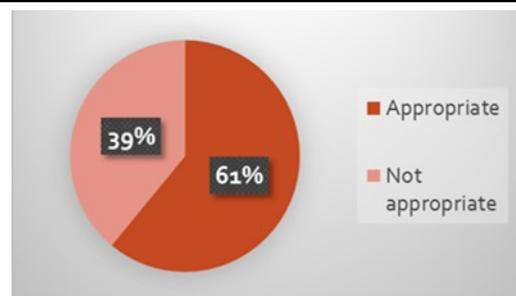


Figure 3. Average attitude (%) of the working women participants



Figure 4. Average of practices adopted by the working women participants

labels in real and got benefits out of it. The difference in the data of the present study and studies reported by other authors may be due to demographic profile differences.

3.6 Correlation between some significant variables

As the qualification of an individual participant increases, the knowledge of foods with gluten-free symbols also increases ($r = 0.384$); on the contrary, as the educational level increases, there is no significant relation seen between it and genetically modified foods awareness ($r = -0.231$). According to Nurliyana *et al.* (2011) and Zugravu *et al.* (2011), no significant association could be established between these two parameters during the study. Vemula *et al.* (2013), Mandle *et al.* (2015), Donga and Patel (2018), Blistein and Evans (2006) through their respective studies concluded that there exists a strong positive association between the educational level of the consumers and their frequency of use of labels in practicality.

Our findings revealed that there was no association established between the occupation and the use of food labels. This was also proved by Masoodi and Mubarak (2019), Jadapalli and Somvarapu (2018) whereas Drichoutis *et al.* (2005) contradicted this.

The monthly income of respondents had a weak positive association ($r = 0.200$) at the significance level of 0.01, with the quality and type of diet they follow. According to Singla (2010), Vemula *et al.* (2013) and Gupta and Dharni (2016) the consumers with a higher level of income tend to use labels more frequently and effectively whereas Jain *et al.* (2018), no significant relationship can be found between these two variables.

A very strong positive correlation ($r = 0.800$) at the significance level of 0.01 was observed between the nutrient claim knowledge and health claim knowledge. The correlation obtained between the frequency of use of labels and satisfaction level is weak ($r = 0.235$), it can be inferred that it is not always compulsory that the people practising the use of labels are always satisfied with the nutrition labels displayed.

A strong positive association ($r = 0.500$) was observed between awareness regarding traffic light displays and their usefulness. The women who had adequate knowledge about traffic lights found it a very beneficial format as it was convenient for them to interpret the colours and their indications.

4. Conclusion

Nutrition labels are the trustworthy source of food information for the consumers by the manufacturers, which enables them to read, interpret and understand every nutritional and health advisory mentioned on the packaged foods to help them to make healthy purchase decisions. A feasible, effective, concise, and more symbol-intensive display format for food labels is advocated by the present study results. Also, there is a need to upskill the consumers not only regarding the use of nutrition labels but also about every aspect of the labels viz., genetically modified foods, gluten-free or lactose-free foods, additional health warnings mentioned on the packets, storage, and cooking instructions. The time has arrived for the nation to headway to the new advances in the field of food labelling and to develop even more modern and futuristic techniques for constructive outcomes that shall benefit the consumers tremendously.

The limitations of the study can be a small sample size along with a single target population i.e. literate working women. The online mode of questionnaire administration can also be considered a limitation as the physical interrogative approach provides more clear information.

Conflicts of interest

The authors declare no conflicts of interest.

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