

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) VIS-A-VIS FOOD LABELS

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ABSTRACT

Background: Food labeling is a tool to promote and protect public health by providing accurate nutritional information so that consumers can make informed dietary choices, while others consider it as an instrument of marketing and product promotion. **Objective:** A descriptive study was conducted to assess the Knowledge, Attitude and Practices (KAP) of the population regarding Food Labels. **Methodology:** Data was gathered using a KAP Questionnaire which included questions of socio demographic profile, knowledge, attitude and practice from hundred (100) adult subjects whether working/non working of Kalkaji area of South Delhi. **Results:** Descriptive statistics analyzed knowledge, attitudes, and behaviors of subjects regarding food labels. It was found out that subjects mean knowledge score was 58%. Knowledge score was positively correlated with attitude score towards food labels ($r = 0.44$, $P \leq 0.01$) and similarly knowledge score was also positively correlated with practices of the same ($r = 0.31$, $P \leq 0.01$). The results showed that only 45% of the subjects knew about food labels out of which 8% strongly agreed that food label is anything which is written on food package, 28% agreed that a logo or a picture on a food package is a food label, 41% agreed that nutritional information is a food label, 40% strongly agreed that expiry/ manufacturing date on a food package is a food label and majority of the subjects (93%) practice reading food labels. **Conclusion:** Nutrition labeling can be an effective means of helping consumers to make healthful food choices. Regulations can play a crucial role in enhancing the potential for nutrition labeling and health claims to promote health. The effectiveness of nutrition labeling and health claims in improving national dietary patterns relies largely on a motivated and educated public to make healthful choices.

Key Words: Food label, Knowledge, Attitude, Practice, Nutrition Labelling

INTRODUCTION

India is the world's second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector. The food processing industry is one of the largest industries in India- it is ranked fifth in terms of production, consumption, export and expected growth. The food industry is on a high as Indians continue to have a feast. Fuelled by what can be termed as a perfect ingredient for any industry, the food sector has been witnessing a marked change in consumption pattern especially in terms of food.

Food Labeling is an important process in the food processing chain and should not be overlooked. The label is the first point of contact between a consumer and the producer. It is used to identify one product from another and also to make a decision over which product to purchase (Kristal *et al*, 1998).

Food labels give you information about the elements of the food and can help you to decide what to choose as part of an overall healthy eating plan (US Food and Drug Administration; Guide to Nutrition Labeling and Education Act, 1994).

Nutrition labeling, if applied correctly and if adequately used, understood and trusted by the consumer, can assist consumers in taking into account the nutritional content of the food product in their purchase decisions and consequently in making informed choices for healthy options and hence for a more healthy diet (Shine *et al*, 1997). It also contributes to consumer protection, as transparency offers consumers their right to know the nutrient content of a food very much like the food's country of origin or its sell-by date (Cowburn *et al*, 2005).

According to **Food Safety and Standards Authority of India, 2011** a label serves the following three primary functions:

- i. It provides basic product information with respect to common name, list of ingredients, net quantity, shelf life, grade/ quality, vegetarian/ non vegetarian society logo, country of origin, name and address of manufacturer, dealer or importer and food standards agency.
- ii. It provides health, safety, nutrition information which includes instructions for safe storage, handling, nutrition information such as quantity of fats, proteins, carbohydrate, vitamins and minerals and preservatives, colours, if used any, quantity per serving of stated size of food (in the nutrition facts table) and specific information on products for special dietary use.
- iii. It acts as a vehicle for food marketing and promotion through promotional information and claims such as 'low fat', 'cholesterol free', 'high source of fibre', 'natural', 'organic', 'no preservatives added' and so on.

KAP surveys are focused evaluations that measure changes in human knowledge, attitudes and

practices in response to a specific situation. KAP studies tell us what people know about certain things, how they feel, and how they behave. Each study is designed for a specific setting and issue (Jackson and Sherri, 2008).

The food nutrition label provides the nutrition information that helps consumers on food choices and gives us information so that customer can choose between foods. Nurliyana *et al*, (2011) aimed to determine the association between knowledge, attitude and practices on food label use and also to determine the factors that influence the use of food labels during making food purchasing decision among university students. A cross-sectional study of undergraduate students in the Kuala Selangor district of Malaysia was conducted in 2011. Three hundred twenty nine students (n = 329) volunteered to complete a Food Label Use Questionnaire (FLUQ) which included question about socio-demographics, level of knowledge about food and nutrition, attitude and practices related to using food labels and factors affecting the use of food labeling. The results showed that, only 21.6% of the students used the food label during food purchasing. These study shows that the practices by read the nutrition information were significantly associated with the use of food label. The important aspect during buying food product was expiry date (98.5%), taste (95.7%), price (92.4%) and nutrient content (90.5%) were significantly associated with the use of food label. The students attitude which was “do not know” how to use nutritional information label and label was not attractive were significantly associated on food label use.

Wen *et al*, (2001) conducted a study to investigate the status of consumers’ Knowledge, Attitude and Practice (KAP) towards nutrition labeling in Harbin of Heilongjiang province and to analyze the problems associated with food nutrition label concerned by consumers for this a survey was carried out among the community residents in Harbin with a questionnaire associated with knowledge about nutrition labeling and they found out that among 189 consumers, 30% considered the information of food nutrition as the first important factor to make a choice. 39.2% knew nutrition labeling and 90% of consumers did not know the issuing and implementation of Food Nutrition Labeling Regulation. 71.7% believed the authenticity of the nutrition label and 56.8% were satisfied with nutrition labeling. So they concluded that the knowledge rate of food nutrition labeling is not high, thus nutrition education should be fortified among consumers.

Wandel, (1997) posits that food labeling is one medium by which consumers can acquire knowledge about the food they buying. This type of information is becoming increasingly important in food markets. She reported the results from a pilot study and a consumer survey including 1050 respondents and revealed that the majority of consumers read the food labels (often, sometimes or seldom), and that the reading frequency was associated with the degree of uncertainty about the food supply. Additives occupied a far more prominent place in these reading activities.

The study focussed with an objective to assess the Knowledge, Attitude and Practices (KAP) of the population regarding Food Labels.

METHODOLOGY

Food labels carry information that will help us to make food choices. Labels will list additives, ingredients and nutrition information such as fat and protein content. Foods that have a shelf life of less than two years must carry a ‘use-by’ or ‘best before’ date. Food labels can help people with food allergies, and may also make nutrition and health claims. A food label also list the country of origin of the food product and many more.

Simple random sampling method was used to obtain the data from the subjects. The study was a Descriptive study where an attempt has been made to analyze the Knowledge, Attitude and Practices i.e. KAP of the population regarding food labels.

The subjects were selected from the Kalkaji area of South Delhi region according to the accessibility of the researcher.

Data collection was done from November 2011 to March 2012.

A suitable questionnaire was designed to collect the information on general background information, knowledge, attitude and practices of the consumers regarding food labels.

The data obtained was then analyzed to assess the KAP of consumers with respect to Food Labels.

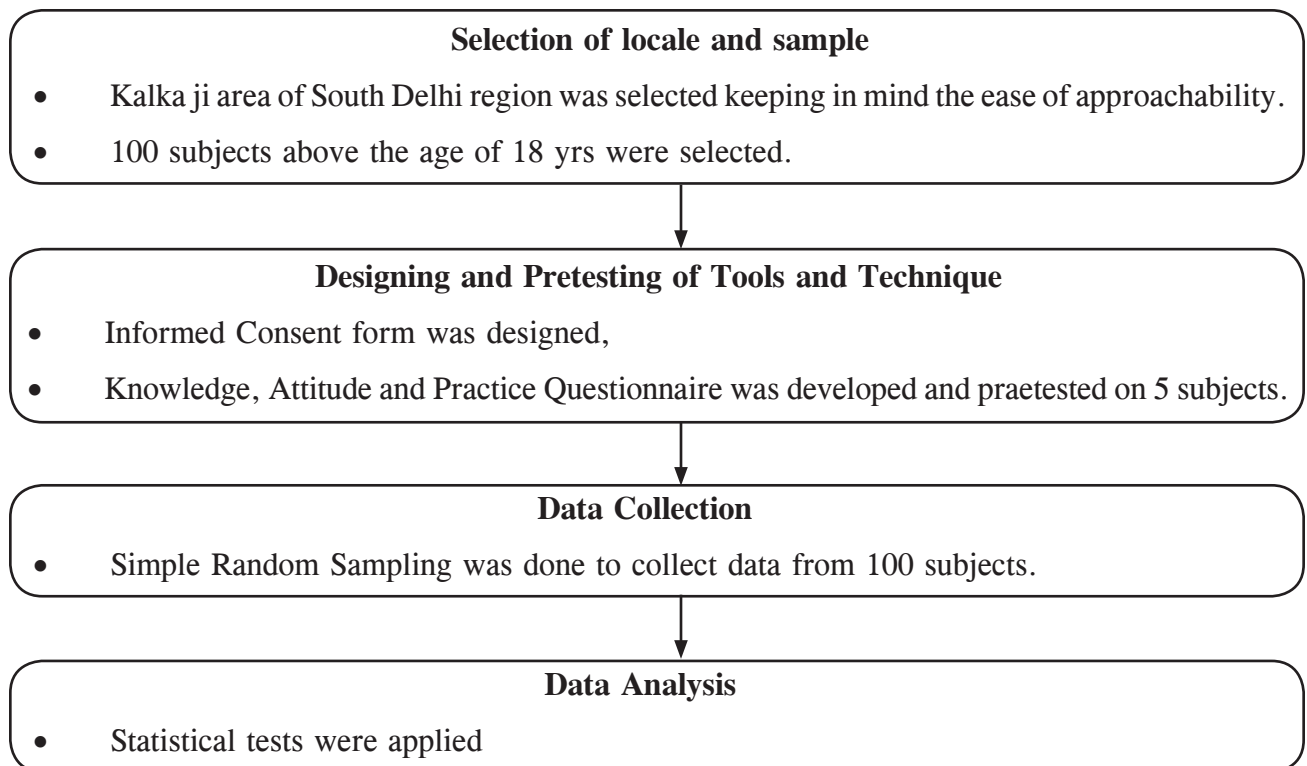


Fig 1: Diagrammatic Representation of Study Design

In the study 100 adult subjects were randomly selected keeping in mind the following criteria:

- Ease of approachability to the researcher
- Age of the subjects
- Educational qualification of the subjects
- Willingness to participate in this study for this informed consent form was obtained from the subjects.

◆ **Tools and Technique:** Questionnaire was designed. The aim of a questionnaire is to gather information for purposes of research for market surveys, analysis or even to corroborate other research findings. It is important to remember that for any questionnaire to be really effective it has to be designed well. It has many advantages over other methods, can contact a large number of people at a relatively low cost (postal and telephone), easy to reach people who are spread across a wide geographical area, face to face questionnaires can make it easier to identify the appropriate person to complete the questionnaire etc.

It has many disadvantages also like response rates can be low (postal) and refusal rates can be high, face to face questionnaires are time consuming for respondents, more costly and more labour intensive than other methods (Oppenheim, 1992).

A suitable questionnaire was designed to collect information.

Data Collection

Rapport Formation

A good rapport formation had taken place as the samples selected were known previously, as a result of which time had been saved and judiciously used for other phases of data collection.

The questionnaire used for collecting the data was pretested on 5 subjects in the same study area prior to sample collection and suitable changes were made accordingly based upon the responses. The samples used for pretesting was not included in the final sample. Pretesting helped in ensuring that questions were unambiguous and easily understandable. Pretesting also ensured the validity and reliability of the tools and technique.

The data was collected door to door by visiting in the study area. The time of data collection was selected keeping in mind the availability of the respondents.

Data Analysis



The data obtained from the subjects was consolidated systematically and transformed scientifically into a master coding sheet. The data was then analysed using various qualitative and quantitative statistical technique.

RESULTS AND DISCUSSION

The present study was an attempt to assess the Knowledge, Attitude and Practice i.e. KAP of the population regarding Food Labels. Food labelling provides a potentially direct and cost-effective vehicle for assisting consumers to identify healthy food choices. Nutrition labels help people identify what type of foods they are ingesting for this a sample of 100 subjects were randomly selected from the locale and then the results were analyzed.

1. Assessment of Knowledge

Table 1: Distribution of subjects on the basis of knowledge

| Questions | Correct Response n (%) | Incorrect Response n (%) |
|--|---------------------------|-----------------------------|
| What is food label? | 45 (45%) | 55 (55%) |
| Food labeling is generally written in a language | 17 (17%) | 83 (83%) |
| Food label on a pre packaged food is applied in a manner | 66 (66%) | 34 (34%) |
| Nutritional facts on food label is given in a form | 38 (38%) | 62 (62%) |
|  Pictorial represents | 83 (83%) | 17 (17%) |
| Additional ingredients mentioned on food label | 68 (68%) | 32 (32%) |
| Information about manufacturer present on food label | 52 (52%) | 48 (48%) |
| Net quantity mentioned on food sample | 42 (42%) | 58 (58%) |
| Identification mark on food label, using which a food item is traced | 79 (79%) | 21 (21%) |
| Date of packing mentioned on a commodity | 74 (74%) | 26 (26%) |
| Food label should not contain any false or misleading | 41 (41%) | 59 (59%) |
|  Pictorial represents | 23 (23%) | 77 (77%) |
| Different macronutrients mentioned on food label | 90 (90%) | 10 (10%) |
| Food labels of edible oils/fats does not contain expression like | 37 (37%) | 63 (63%) |
| Package of drinking water shall carry a declaration | 79 (79%) | 21 (21%) |
| Declaration on one time usable plastic bottles of packaged drinking water | 93 (93%) | 07 (07%) |

According to the present study as we can see in the above table only 45% of the subjects knew about that a food label consists of nutritional information, expiry/ manufacturing date or any logo on a food item. Similarly only 17% had knowledge that food labels are written either in Hindi or English.

Only 66% of the subjects had correctly given the answer that food labels on a pre- packaged are applied in manner which is not easily removable.

It was also seen that only 38% of the subjects knew that nutritional facts are given as per 100g/ 100ml on a package of food whereas majority of the subjects i.e. 83% had knowledge of the declaration given on non- vegetarian food.

Food additives, natural/ synthetic colors/ flavors are additional ingredients that are mentioned on the package of food and about 68% of the subjects had knowledge about this similarly only 52% of the subjects knew about that full name, complete address and manufacturing unit are information about the manufacturer that are present on the food label.

On the basis of data we can see that only 42% of the subjects knew about that net quantity by weight/ volume is mentioned on a food label whereas majority of subjects i.e. 79% had knowledge that lot/ code/ batch number is the identification mark on a food label, using which a food item can be traced during the manufacturing or distribution process.

According to D/M/Y a manufacturing/ packing is mentioned on a food commodity and it was known by around 74% of the subjects and also 41% had knowledge that a food label should not contain any false or misleading statement or claim, design or device and fancy name or abbreviation.

Only 23% of the subjects correctly knew about the declaration that is given on irradiated food whereas almost 90% had knowledge that energy, proteins, carbohydrates and fats are the different macronutrients that are mentioned on a food label but only 37% knew that double refined/ ultra refined, anti cholesterol/ cholesterol friendly and soothing to heart are the expressions that should not be present on the labeling of edible oils and fats.

Every package of drinking water shall carry packaged drinking water declaration which was known by almost 79% whereas 93% of the subjects had knowledge that one time usable plastic bottles of packaged drinking water should be crushed after use.

A cross-sectional study was carried out from May to August 2016. Three supermarkets were randomly selected for the study. The sample size of 153 was taken. The awareness of food labels on prepacked food items was reported by 92.2% of the participants and 99.3% preferred food items with label. However, only 76% of the study participants checked for food labels every time

during purchase and only 7.2% reported that understanding the food label was easy. The cost, instructions for use, ingredients, manufacture, and expiry date were checked by the majority of the participants. The reason for checking the food labels were health related (69.3%), pregnancy/under-five/noncommunicable disease (NCD) in family members (11.8%), weight reduction plan (9.1%), purchasing the food item for the first time (12.4%), and preferring organic food products (29.4%). The responses were obtained through open-ended question. Thus the study reported high level of awareness of food labels and preference of the food items with the food labels. However, the ease of understanding of the food label was reported very less (Jain et al, 2018)

The findings of the study indicated that the majority (71.9%) of the participants claimed that they do not 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 the use of nutrition information when shopping, where only 9.3% claimed that they utilize that knowledge when shopping. The study also 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. (Deshmukh and Goyal, 2017)

2. Assessment of Attitude

Table 2: Distribution of subjects on the basis of attitude

| Statements | Responses (n= 100) | | | | |
|---|--------------------|----------|----------|----------|----------|
| | 1 n (%) | 2 n (%) | 3 n (%) | 4 n (%) | 5 n (%) |
| Food label is anything which is written on a package of food. | 20 (20%) | 29 (29%) | 17 (17%) | 26 (26%) | 8 (8%) |
| A logo or picture on a food package is a food label. | 14 (14%) | 31 (31%) | 7 (7%) | 28 (28%) | 20 (20%) |
| Nutritional information on a food package is a food label. | 1 (1%) | 14 (14%) | 10 (10%) | 41 (41%) | 34 (34%) |
| Expiry/ manufacturing date on a food package is a food label. | 10 (10%) | 16 (16%) | 5 (5%) | 29 (29%) | 40 (40%) |

The above table shows that around 29% of the subjects disagreed that food label is anything which is written on a package of food and only 8% strongly agreed, similarly 31% disagreed that a logo or a picture on a food package is a food label and 28% were agreed. The present study revealed that only 1% of the subject had strongly disagreed whereas 41% of the subjects agreed that nutritional information is a food label. Similarly Scott and Worsley (1994) in New Zealand did

a comparison between four nutrition labeling and it was found out that traditional nutrition label was disliked (79%) and one third of the samples (particularly those with less education) could not identify the number of grams of Fat in 100g as written on the table. The alternative designs were simpler and were liked more.

In the study conducted in Ireland on Consumers' Attitudes to Food Labelling found that the aim of food labelling is to inform consumers of the characteristics of a food product, so that they can make a more informed purchasing decision, this study found that over one half of consumers never, rarely or only sometimes read food labels. The proportion of consumers who always consult food labels, however, has risen to 25% from 8% in 2004 (Food Safety Authority of Ireland, 2009)

Also 16% of the subjects had disagreed to the statement that expiry/ manufacturing date is a food label whereas about 40% strongly agreed on the same.

3. Assessment of Practices

Table 3: Distribution of subjects on the basis of practices

| Statement | Responses n (%) |
|--|-----------------|
| Do you read food labels? | 93 (93%) |
| Do you read nutritional information on a food label? | 90 (90%) |
| Do you check for expiry/ manufacturing date on a food label? | 86 (86%) |

The above table shows the data of the population who were following these food label practices. The current study found out that 93% of the subjects read food label and the same results are shown by Mintel, (2006) who surveyed the population and reported that women read food labels more than men (64% compared to 41% of respondents). He also suggested that approximately half of UK food consumers read the labels on initial purchases 'always' (32%) or 'usually' (20%). Further (35%) of consumers report reading food labels 'occasionally' or 'rarely' and 13% say that they never read food labels. These proportions were also supported by Sabbe et al, (2009) and Neuhauser et al, (1999); Todd and Variyam, (2008). Similarly a study conducted by Kafatos with Food Standard Agency (2001) found that 68% of men were less likely to report an interest in reading nutrition labels. Women those on a higher income and people who have attained a higher level of educational achievement were most likely to report looking at labels. Consumers with a special interest or positive attitude to diet and health were most likely to report higher kinds of label reading.

The present study shows that almost 90% of the subjects read nutritional information, the study is supported by Black et al, (1992) who along with European Heart Network (2003) reported that only 57% prefer and understands the terms used on nutrition information panel (NIP). They also found that although some consumers could understand some of the information on nutrition labeling, in general they reported finding nutrition labeling confusing. Consumers reported that they did not understand the terms fat, calories/ kilocalories, sugar, vitamins and salt. The concepts and terms reported as least well understood were the relationship between calories and energy; sugar and carbohydrates; and terms cholesterol and fatty acids. Consumers had difficulty in understanding the role that different nutrients mentioned on labels played in their diet. They also had difficulty converting information from g/100g to g/serving and serving size information also proved difficult to interpret. In general, older consumers and people with lower levels of education or income likely to have the most difficulty understanding the terms used on food labels.

It was also seen that 95% of the subjects read expiry/ manufacturing date.

Table 4: KAP Scores Obtained by Subjects

| Parameter | Mean \pm S.E |
|-----------|-------------------|
| Knowledge | 9.27 \pm 0.23 |
| Attitude | 182.43 \pm 1.96 |
| Practice | 28.05 \pm 0.62 |

The above table shows the KAP scores obtained by the subjects regarding food labels. The mean score for knowledge was found to be 9.27 where in the maximum score (93%) was taken up by the question “ The” correct declaration given one time usable plastic bottles of packaged drinking water?” with correct answer as “Crush the bottle after use” followed by the second highest score (90%) where the question was “ The different macronutrients mentioned on a food label” with correct answer as “all of the above” which included energy, proteins, carbohydrates and fats”. Similarly the mean scores for attitude was came out to be 182.43 where the subjects had rated the statements from strongly disagree to strongly agree where in the highest score (64%) for strongly disagree was taken up by the statement “brown colored box as declaration for vegetarian item” and highest score (74%) for strongly agree was seen in the statement “brown colored box as declaration for non- vegetarian item”.

Also the mean scores for practices was 28.05 and it was seen that the practice which was followed by most of the subjects (95%) was that they check for expiry/ manufacturing date on a food label

before purchasing followed by 93% as they do read food labels and 91% as they knew the correct declaration for non- vegetarian and vegetarian food items.

Table 5: Correlation between scores of Knowledge, Attitude and Practices

| Parameter | r |
|------------------------|--------|
| Knowledge and Attitude | 0.443* |
| Knowledge and Practice | 0.316* |
| Attitude and Practice | 0.275* |

* $p \leq 0.01$

In the current study the KAP of the subjects regarding food labels was assessed and the study revealed that there was a significant positive correlation between the three parameters i.e. knowledge, attitude and practice at 1% level of significance. Knowledge score was positively correlated with attitude ($r = 0.443, p \leq 0.01$) and practice ($r = 0.316, p \leq 0.01$) and when attitude was positively correlated it was found to be $r = 0.275, p \leq 0.01$. This showed that subjects had knowledge of food labels due to which their attitude towards food labels got changed and so does their practices. Similarly a descriptive, non experimental study done by Marietta *et al*, (1999) examined the influence of 1990 Nutrition Labeling and Education Act food labels on college students where they examined the knowledge, attitudes, and behaviors of college students regarding labels and relationships among these factors, and whether educational experience with labels was associated with label-reading knowledge, attitudes, and behaviors. So they found out that students' mean knowledge score was 48%. Knowledge score was positively correlated with attitudes toward labels ($r = 0.14, P = 0.04$) and use of labels ($r = 0.87, P = 0.0001$). Previous education in reading labels was associated with higher knowledge scores ($P = 0.04$). Ninety-five percent of participants perceived the label to be useful, but many distrusted nutrition claims. Seventy percent looked at the Nutrition Facts label when purchasing a product for the first time. The single best predictor of general label use was a positive attitude toward labels ($P < 0.001$), followed by being a woman ($P < 0.01$). So they concluded that the 1990 National Labelling and Education Act food label has influenced college students. Labelling education efforts are associated with greater knowledge about labels, more favourable attitudes toward them, and increased label use in making food choices.

CONCLUSION

Consumers in the past could make individual decisions after thorough examination of food products by viewing or handling the open item. With the advent of processing technology a number of pre- packaged food items are now available in the market. The modern package label has taken the responsibility for educating the consumers about the product by multitasking such as, attracting, promoting and motivating at the point of purchase through the information on the label. The information about nutrition labeling and health benefits of the food is one of the important factors that influence decision making.

Labeling is an important process in the food processing chain and should not be overlooked. The label is the first point of contact between a consumer and the producer. The label is therefore the most important tool for a product. It should be eye catching while at the same time being informative. A dirty, confused, untidy label will not help to sell a product.

Thus the main aim of the study was to assess the KAP of the adult population regarding food labels using KAP Questionnaire which included socio- demographic profile, questions of knowledge, attitude and practices of food labeling.

The current study can be summarized as follows:

It was found out that subjects knowledge score was 58%. Knowledge score was positively correlated with attitude score towards food labels ($r = 0.44$, $P \leq 0.01$) and similarly knowledge score was also positively correlated with practices of the same ($r = 0.31$, $P \leq 0.01$). The results showed that only 45% of the subjects knew about food labels out of which 8% strongly agreed that food label is anything which is written on food package, 28% agreed that a logo or a picture on a food package is a food label, 41% agreed that nutritional information is a food label, 40% strongly agreed that expiry/ manufacturing date on a food package is a food label and majority of the subjects (93%) practice reading food labels. Key results showed that the most widely used label elements were the use by/best before dates, ingredients list and nutrition information, declaration of vegetarian, non-vegetarian food items and the least used labeling element were the, presence of food additives, irradiated food declarations.

So it can be concluded that consumers generally understand the link between food and health, they have knowledge about food labels but their attitude and practices vary. Consumers think that labels on food are supposed to help them make informed choices about what they eat. Not surprisingly, people want labels to be readable, clear, attractive and well structured. Sometimes people get confused by the terminology used in food labeling also consumers are more influenced by the

price, packaging and advertising of the product instead of its nutritional benefits. Even if basic awareness is there, more emphasis is given to the calorie and fat contents instead of other important factors like the amount of vitamins and minerals.

Thus the need of an hour is that although there are number of public campaigns and researches that are conducted in relation to the food value or quality of processed food products in India but it is almost negligible. Hence, there needs to be a change in the mindset of the people and conscious awareness has to be induced for a better, healthier living experience. Although Government is advertising about labels and food safety norms with the help of media but people are not showing their interest so government should try and make extra effort in providing consumer education. FSSAI has also started advertising about food labels in newspapers, on radios and on banners etc. as people today are more concerned about health and hygiene so keeping these basic things in mind can make a big difference in the society

REFERENCES

1. Black, A., & Rayner, M. (1992) (Coronary Prevention Group). Just Read the Label. London: The Stationary office.
2. Cowburn, G. & Stockley, L. (2005) Consumer understanding and use of nutrition labelling: a systematic review, *Journal of Public Health Nutrition*;, 8:21-28.
3. Deshmukh, N. & Goyal, R. (2017) Food Label Reading Knowledge and Understanding Among Consumers. *Int J Nutr Pharmacol Neurol Dis* 7:71-2
4. European Heart Network. (2003) A Systematic Review of the Research on Consumer Understanding of Nutrition Labeling. Brussels: European Heart Network.
5. Food Safety and Standards Authority of India. (2011). <https://www.fssai.gov.in/>. Accessed on 12.3.2020.
6. Food Safety Authority of Ireland, (2009) A Research Study into Consumers' Attitudes to Food Labelling December (www.fsai.ie.) Accessed on 10th March 2020
7. Jackson, S L. (2008) *Research Methods: A Modular Approach*. Belmont, California: Thomson Wadsworth
8. Jain, S., Gomathi, R., & Kar, SS. (2018) Consumer awareness and status of food labeling in selected supermarkets of Puducherry: An exploratory study. *Int J Adv Med Health Res*; 5:36-40.
9. Kafatos, AG. & Codrington, CA. (2001) Eurodiet Reports and Proceedings, *Journal of Public Health Nutrition*; 4(2A): 265-436.

10. Kristal, AR., Levy, L., Patterson, RE., Li, SS. & White, E. (1998) Trends in food label use associated with new nutrition labeling regulations, *American Journal of public Health*; 88(8): 1212-1215.
11. Marietta, AB., Welshimer, KJ. & Anderson, SL.(1999) Knowledge, attitudes, and behaviors of college students regarding the 1990 Nutrition Labeling Education Act food labels. *Journal of American Dietetic Association*; 99(4): 445-449.
12. Mintel Reports. (2006) Food Packaging (Document provided by FSA).
13. Neuhouser, ML., Kristal, AR. & Patterson, RE.(1999) Use of food nutrition labels is associated with lower fat intake, *Journal of Dietetic Association*, 99:45-53.
14. Nurliyana, G., Norazmir, MN & Khairil, MI. (2011). Knowledge, Attitude and Practices of University Students Regarding the Use of Nutritional Information and Food Labels. *Asian Journal of Clinical Nutrition*; 3: 79-91.
15. Oppenheim, AN. (1992) Questionnaire design interviewing and attitude measurement, second edition, London; St. Martin's press.
16. Sabbe, S., Verbeke, W. & Damme, V. (2009). Perceived Motives, Barriers and Role of Labeling Information on Tropical Fruit Consumption: Exploratory Findings, *Journal of Food Products Marketing*; 15(2): 119-138.
17. Scott, V. & Worsley, AF.(1994) Ticks, claims, tables and food groups: a comparison for nutrition labeling, *Journal of Public Health*; 9: 296-300.
18. Shine, A., O'Reilly, S. & O'Sullivan, K. (1997). Consumer attitudes to nutrition labeling, *British Food Journal*; 99(8): 283-289.
19. Todd, JE. & Variyam, JN. (2008). The Decline in Consumer Use of Food Nutrition Labels, USDA, Economic Research Service.
20. US Food and Drug Administration (FDA). (1994). Guide to Nutrition Labeling and Education Act (NLEA) Requirements.
21. Wandel, M. (1997). Food labeling from a consumer perspective. *British Food Journal*; 99(6): 212 – 219.
22. Wen, B., Yan, Z. & Wei, X. (2001). Department of Nutrition and Food Hygiene, School of Public Health, Harbin Medical University (Harbin 150081, China).