Section: Miscellaneous

Original Research Article

AN ASSESSMENT OF NEED OF IEC ON FRONT OF FOOD PACKAGE LABELS INFORMATION AMONG SCHOOL GOING ADOLESCENTS IN URBAN AREA OF SURGUJA DISTRICT

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ABSTRACT

Background: Front of package food labels (FoPL) has been repeatedly recommended and considered a legitimate tool by the World Health Organization (WHO) as one of a suite of measures needed to improve population diets by using nutritional fact given in the packaged food items. Nutritionlabeling support the goal of promoting healthy eating by the public health community, government and companies because dietary habits are considered as significant contributors for Non-communicable diseases (NCDs) which is also called lifestyle diseases. This study was conducted to assess the adolescent's knowledge on FoPL, understanding of nutritional information on FoPL, change in attitude after health education for using FoPL information to make healthier food choice.

Materials and Methods: Carried out an institutional based, descriptive Cross sectional study among 300 School going adolescent in urban area of Surguja Chhattisgarh. This study group were chosen because they will use FoPL to make healthier food choice which help in preventing malnutrition from adolescent age of life cycle. Data was collected through using pre -designed, pre-tested questionnaires and data was compiled in MS Excel, analyzed in SPSS TRAIL Version 21.

Results: Overall only 82 (27.3%) & 43 (14.3%) of the study subject were having good general knowledge of Front of package food labels & nowledge of information related to nutrition contents and health respectively. Only37(12.3%) having good understanding of nutritional information in FoPL regarding contents & health. Positive attitude before intervention use of front of food package labels information before purchasing food packets only 133 (44.3%) of subjects which was changed to 287 (95.6%) subject towards to use front of food package labels information in their future before purchasing packed food. Changing of attitude by information education communication was highly statistically significant.

Conclusion: The present study successfully proved that poor knowledge & poor understanding of nutritional fact label on front of food package labels need information education communication on front of food package labels information among school going adolescents.

Keywords: Nutritional factlabels, Knowledge, attitude, understanding, Food safety and standards, Indian Council of Medical Research - National Institute of Nutrition.

INTRODUCTION

"Health & taste, hand in hand". The type of food consumption determines the nutrition & health of the population. While type of food choice & consumption being influenced by several factors such as economic, social, and cultural variables as well as personal, psychological, and biological factors which are related to the individual.[1] In recent Food choices are influenced by the growing availability of processed & pre-packagedfoods, which have become increasingly popular with a rapid increase in the consumption rate of them.[2,3]

At present, health issues that are being attributed to diet are found to be increasing manifold 1. Unhealthy diet, physical inactivity, and stress are factors for obesity, and ultimately obesity is a risk factor for non-communicable diseases. Overweight adolescents argued that obesity was hereditary, while the normal-weight participants perceived "faulty food habits" and laziness as the reasons.[4]

According to WHO, worldwide nearly 43% of adults were overweight & 16% were obese in 2022.[2] leading to epidemic levels. This may be due to falling short of the minimum standards for a healthy and sustainable diet (Global Nutrition Report 2022). In India, the prevalence of obesity among adults grew from 19.75% during 2015-16(NFHS-4) to 23.45% during 2019-2021 (NFHS-5). In Chhattisgarh, the prevalence of obesity also increases at the same rate as the national level, from 11.5% (NFHS-4) to 14.5%(NFHS-5).[5]

At the 75th World Health Assembly in 2022, member states endorsed the WHO acceleration plan to stop obesity for prevention & management of obesity as stopping the growing obesity epidemic is one of the 2025 Global Nutrition Targets among adolescents and adults. Obesity prevention and management necessitate multisectoral policies and actions that go beyond the health sector.

Acting across multiple settings and scaling up impactful interventions are shown in the [Figure 1].[6]

Figure 1. Act across multiple settings and scale up impactful interventions

Front of package food labels (FOPL) has been repeatedly recommended by the world health organization (WHO) as one of a suite of measures needed to improve population diets.7-8 Nutrition labeling has been considered as a legitimate tool to support the goal of promoting healthy eating by the public health community, government and companies because dietary habits are considered as significant contributors for Non-communicable diseases (NCDs) which is also called lifestyle diseases.[7-10]

In India, among the different age groups of consumers, adolescents are among the more frequent buyers of packaged foods.[11,12] Snehasree et all the practice of purchasing of packed food among adolescents ranging from 44.1% to 86.5%.[13]

Displaying nutrition information is mandatory in India according to the Food Safety & Standards (Packaging and labeling) regulation, 2011 accordance with the existence of the 24th August 2006 Food Safety & Standards Act in India.[14] Which plays a critical role in promoting healthy eating habits.

For effective utilization of food labeling information, consumers' nutrition literacy, knowledge & understanding to evaluate calorie & nutritional information are important factors. Despite its importance reviews of consumers, often read FoPL, understanding & use of nutritional information are important barriers for use of this legislative tool 15 Relatively few studies investigated knowledge effects on the use of ingredient lists and claims, compared to nutrition facts labels.

In Chhattisgarh, as there was no baseline study performed to assess the knowledge & understanding of nutritional information on FoPL: hence, the present study aimed to emphasize on development of a policy for IEC activity to build practice of using food pack label information with better understanding before purchasing packed food. This study put forward the assumption based on poor knowledge and understanding of barriers to using information on FoPL.[15]

Hypothesis (H1)-Students who have a higher understanding of nutrition fact labeling are more likely to have a positive attitude toward using nutrition labels.

Objectives

1. Assess the knowledge and understanding status of general knowledge of FoPL, Knowledge of basic product information given in FoPL, Knowledge of information related to nutrition contents and health, understanding of nutritional information and logos on FoPL among study subject
2. Assess the knowledge of nutrition information and health on FoPL.
3. Assess the adolescent's understanding of nutritional information and logoson FoPL regarding health.
4. To evaluate the effectiveness of IEC on attitudes of use FoPL information.

MATERIALS AND METHODS

Study design, study area, study subjects, sampling, sample size

The present study was an interventional study was conducted in the government& private school of urban area of Ambikapur of Surguja District (Chhattisgarh), from September 2024 to December 2024.Ethical approval for the study was obtained from Institutional Ethics Review Committee of Rajmata Shrimati Devendra Kumari Singh dev Ambikapur. No./IEC/02/GMC dated 06/04/2023.

Simple random sampling used for selection of sampling unit i.e. one government& one private higher secondary school. For selection of study subject systemic random sampling was used as total students of enrollment was more than sample size for data collection but for IEC activity involved all the students present during survey period.

Study Subject were adolescents age group of above 14 years studying in 9th to 12th standard, present during the survey, willing to participate assessed by availability of parents written consent and student assent. Any eligible students not willing to participate in the study were excluded.

Considering prevalanceas 51% (Knowledge of that food label must be read irrespective of health issues or diseases),[5] absolute precision =6% at 95% of confidence interval using statulator was 267 which was rounded up 300.

Questionnaire administration & data collection

Study Tool used was self administered semi structured, pretested closed-ended questionnaires both in Hindi & English language based on food safety & standards (labelling & display) regulations India, 2020,[10] & fda.gov/food/nutrition-food under section- nutrition,[16] Food Labeling and dietary guidelines for Indians by ICMR -NIN section 15.[17] TA knowledge, understanding and attitude questionnaire of 50 questions about FoPL was designed. The questionnaires containing -demography, basic knowledge of FoPL and general information on FoPL, Knowledge of information related to nutrition on FoPL, pictorial or logo, understanding of information related to nutrition on FoPL prepared different questions like calculate total energy provided by food items, total content of sodium, meaning of serving, meaning of expiry date, meaning of daily value, interpretation of consumption of food according to expiry date , total calorie, daily value, added sugar amount, sodium content, unsaturated fat contents, fibres, vitamins, stars rating, identification of pictorial or logo, before & after IEC attitude toward using FoPL information.

Intervention- students of each class those were after randomisation involved for data collection, separately health education was given by trained postgraduate students of community medicine started with icebreaker session, some general information about habit of packed food consumption conducted about 10-15 minutes. IEC materials was prepared in power point & open discussion for clarifying doubts of participants after each part of content. A 30-45 minutes power point presentation was prepared based on contents of data tools questionnaires (food package label pictures, regulatory rules, authority, calculation of energy, interpretation of consumption of food items according to energy label, sodium, saturated fat, daily value level, means of added sugar, different logos and diseases which can be prevent by right food choices.

Categorization & scoring of knowledge, understanding & attitude

Assessment done on each section of study tool were basic knowledge of FoPL (marks 0-7) , basic product information on FoPL (marks 0-8), information related to nutrition on FoPL (marks 0 -16), understanding of information related to nutrition information on FoPL (marks 0-14), based on correct or wrong answers to questions awarded “1” or “0” marks respectively, according to food safety & standards (labelling & display) regulations India, 2020,[10] & fda.gov/food/nutrition-food under section- nutrition,[16] Food Labeling and dietary guidelines for Indians by ICMR -NIN section 15.[17] Marks of each section were added to obtain the total scores of respective section of each student. Using Bloom’s criteria,18categorize group students into good (score equal or >80%) average (score 60% to<80 %), and poor (score <60%) knowledge or understanding & result represented in percentages. For assessment of attitudes “yes” awarded ‘1’ marks while “no” awarded ‘0’ marks. For categorization in to positive attitude those scored more than 70% & for negative attitudes scored less than 70% towards using FoPL (marks 0-10). Statistical analysis done in SPSS TRAIL Version 21. Continuous data for each section score summarized as mean and SD. Chi square test was used to evaluate the change in attitude of use FoPL information and association of knowledge and understanding.

RESULTS

A total of 300 adolescents students of private & government school were interviewed regarding knowledge & understanding of information on FoPL. The subject predominantly girls 159 (53%), mean age was 16 ± 1.47 years and maximum age was18years while minimum age was 14.2 years, 195 (65%) belong to nuclear family, 265 (88.33%) of students parents having no history of non-communicable diseases.

Assessment of Knowledge status shows that maximum 189 (63%) students had good knowledge about basic information given in FoPL. But maximum 176 (58.7%) hadpoor knowledge of nutritional information. While maximum students 173 (57.66%) had average knowledge on general knowledge about FoPL. As regards understanding of nutritional information & logos given in FoPL maximum students 167(57.7%) had poor followed by96(32%) had average understanding. [Table 1]

Knowledge about nutrition information on FoPL is depicted in [Table 2], Maximum 185(61.66%) knew Calories and serving information 179(59.66%) were known by the students. Regarding nutrition contents 51.33%,50.66% knew that FoPL gives information about fat and sugar contents of food respectively. While only 98 (32.66%) knew about sodium content information. Regarding health claims or risk reduction information knew only by 20.66%. Type of educational institute statistically significant play role in knowledge of most of the nutritional fact information, except preservative, additives & no health claim risk, micronutrient and vitamins. Studies in private school had more knowledge about nutritiona information given in FoPL.

In assessment of understanding of nutrition information shown in [Table 3]. Maximum 221 (73.66%) student interpreted the kcal means energy, 177(59%) able to calculate total energy by serving information and only 154(51.33%) understand that packed food providing sodium less than 5gm per day are good for health. But

understanding of other nutrition information was poor. Only 63(21%) understand means of % Daily Value followed by 75(30%) understood that more than 25g for 2000kcl per day is bad for health. On assessment of understanding for logos maximum 207 (69%) able to identified symbol for fortification used in FoPL followed by vegetarian, non vegetarian181 (60.33%) and only 99 (33%) students able to write stands for FSSAI. Knowledge of fortified symbol was statistically significant among students of different institutions.

In [Table 4], after intervention changes in the attitude towards use of FoPL information for choice of healthier food shown that it is important to know nutrition legislation was 266 (86.66%) which was before intervention 202 (67.3%), knowing & reading of FoPL is important was 200 (66.7%) before intervention, which change to294 (98%).and use FoPL information before purchasing food packets changed from 133 (44.3%) to 287 (95.6%). This finding was statistically highly significant.

Table 1: Assessment of knowledge & understanding status of adolescents onFoPL

Variable	Good	Average	Poor
	N%	N%	N%
General knowledge about FoPL	82(27.3%)	173(57.66%)	81(27%)
Knowledge of basic product information given in FoPL	189 (63%)	68(22.6%)	43(14.3%)
Knowledge of information related to nutrition contents and health	43(14.3%)	81 (27%)	176(58.7%)
Understanding of nutritional information in FoPL regarding health and logos	37(12.3%)	96(32%)	167 (57.7%)

Table 2: Distribution of subject according to knowledge of nutrition information given in FoPL

Variables	Total	Private School (N=150)		Govt. School (N=150)		P value
	N (%)	N	%	N	%	
Serving information	179 (59.6%)	117	78	62	41.33	0.0001
Energy (calorie)	185 (61.66%)	104	69.33	81	54	0.0063
Fortified	144(48%)	73	48.7	71	47.3	0.0530
Preservative	118 (39.33%)	66	44	52	34.66	0.0980
Additives	105 (35%)	63	42	63	42	1.000
Vegetarian /non-vegetarian food symbol	159 (53%)	100	66.66	59	39.33	0.0001
Health safety and warning	137 (45.66%)	92	61.3	45	30	0.001
No Health claims or risk reduction	62 (20.66%)	33	22	29	19.3	0.5685
Nutrition contents information						
Micronutrients	117(39%)	65	43.33	52	34.66	0.1239
Sugar	152 (50.66%)	88	58.66	64	42.66	0.0056
Fat	154 (51.33%)	88	58.66	66	44	0.0110
Sodium	98 (32.66%)	58	38.66	40	26.66	0.0267
Carbohydrate	146 (48.66%)	89	59.33	57	38	0.0002
Vitamins	98 (32.66%)	56	37.33	42	28	0.0848

Table 3: Assessment of adolescents on the understanding of information in FoPL regarding health and logos

Information in FoPL	Total	Private School (N=150)		Govt. School (N=150)		P value
	N (%)	N	%	N	%	
Importance of expiry dates	132 (44%)	67	44.7	65	43.33	0.0086
IndicatingKcal means energy	225 (73.66%)	125	83.33	96	64	0.0001
Calculation of total energy by serving information	179 (59.66%)	99	66	80	53.33	0.0253
Meansof % Daily Value	63(21%)	43	28.66	23	15.33	0.0053
Means of less than 5% Daily Value Level of a nutrient per serving (use/non use)	101(33.66%)	53	35.3	48	32.0	0.5413
Means of 20% or more Daily Value Level of a nutrient perserving(use/not use)	101 (33.66%)	53	35.3	48	32	0.5413
Means of added sugar	116 (38.66%)	59	39.3	57	38.0	0.0562
Total content in saturated fat of more than 10 grams for 2000 kcl per day is good or bad	103 (34.33%)	48	32	55	36.66	0.3946
The total serving of sodium 5g/day is good or bad	154 (51.33)	63	42	91	60.66	0.0012
Total content in sugar 25g for 2000 kcl per day is good or bad	90 (30%)	39	26	41	27.33	0.7940
More stars means in front of processed food	112 (37.33%)	69	46	43	28.66	0.0019
FSSAI stands for	111 (33%)	56	37.33	55	36.67	0.9051
Logo for fortification	207 (69%)	115	76.66	92	61.33	0.0041
Logo for veg. food	181 (60.33%	100	66.66	81	54	0.0249
Logo for non veg. food	181 (60.33%)	100	66.66	81	54	0.0249

Table 4: Attitudes to use of FoPLinformation to choose healthier food (n=300)

	Variables	Before intervention		After intervention		p-Value
		Positive attitudes N (%)	Negative attitudes N (%)	Positive attitudes N (%)	Negative attitudes N (%)	
1	About nutrition labeling legislation importance	202((67.3%)	98(32.7)	266(86.66%)	34(11.3)	0.001
2	Knowing & reading of FoPL is important	200(66.7%)	100 (33.3)	294(98%)	06(2)	0.001
3	Important to know maximum and minimum consumption values per serving					

I	Fat	184(61.3%)	116 (38.7)	263(87.6%)	37(12.3)	0.001
II	Calories	184(61.3%)	116 (38.7)	269(89.6%)	31(10.3)	0.001
III	Sugar	174 (58.0%)	126 (42.0%)	263(87.6%)	37 (12.3)	0.001
4	Does FoPL information help to prevent health problem	166 (55.3)	134 (44.7)	293(97.6%)	07(2.3)	0.001
5	Use FoPL information before purchasing food packets	133 (44.3)	167 (55.7%)	287(95.6)	08(2.6)	0.001

DISCUSSION

The present study covered both private & government high school with assumption that students from private school consume more packed food than students from government school as they belong to higher socioeconomic status consumes more packed food and have good knowledge. Previous studies Shireen et al,[19] carried out a study on food label & its influences among Indian consumers -A review with objective of association between sociodemographic characterstics and food label usage found that people with higher income consuming on shopping due to good income. Another study also shows awareness of FoPL was statistically significant with sociodemography.[3] But here were many studies found that maximum subjects were some times used to read FoPL.[9,20] Our studies also found similarly that only133 (44.3%) students had attitude of use of FoPL information before purchasing. Thismight be due to lack of understanding and knowledge of FoPL.

Our study found that maximum students had average knowledge regarding general knowledge about FoPL. But Annamalai et al,[21] and other study Sindhu et al,[22] Shatkaratu et al,[23] al shows sound knowledge for any regulatory rules for food labeling on pre-packed food items, among medical and non medical students. It may be due to create awareness during their academic curriculum as contents are available in medical students. So there is need of include food safety contents in our state academic curriculum also.

Finding of the present study Knowledge of general information given in FoPL was showed that majority of students had good knowledge 189 (63%) in contrast to that minority subjects [43(14.3%)] had good knowledge of nutrition information given in FoPL. Concurrent many studies also shows that subject reading general iformation like expiry date, brand name, MRP etc.[20,23] This might be due to easy understand by the subjects about general information, perception to be very important in food label & price may influence the purchase.[24]

For knowledge of nutrition information given in FoPL less than 60% subjects were knew that health risk claims, preservatives, additives, serving information, vegetarian and non vegetarian origin, information regarding no health claim or risk reduction & food fortification. A closer look outcomes of Goyal et al,[2] Saha Set al,[9] (50.5%),[5] shows that notice of nutritional label. While Sindhu et al,[22] shows that 68% subjects notice of nutritional label and 60 % to 80% adolescent had knowledge of vegetarian and non vegetarianorigin, but unit of calories, nutrition and health claims was average knowledge. Addition to above findings, on exploration of knowledge of nutrition contents information found that only half of subjects knew about sugar and fat respectively. Similarly about micro-nutrient, sodium, carbohydrate, vitamins knew by less than 50% of students, consistent with the finding of Sindhu et al.[22] The above findings thus reaffirms the students were lack of knowledge regarding nutrition information. and this may be act as barrier for utilization of FoPL information. However, the dietary guidelines for Indians suggest that carbohydrate is important sources for energy, fatis important nutrient for physical growth and cognitive development of adolescents, dietary sodium reduction to manage hypertension.[17] So before consuming any food products consumers should know about contents of nutrients.

A school based cross sectional stydy Talagala et al,[25] Good nutrition related knowledge was demonstrated by 84.1% of students. The majority of able to interpret “high in fat” this was However Daily Allowance (%RDA) was relatively poor .But present study observed that understanding of nutritional information on FoPL regarding health was good only by 12.3% students which was contrast to Talagala et al. did so for various reasons such as their previous pleasant /unpleasent experience of similar product.[25] In this study majority (73.66%) subjects interpreted Kcal means energy. The reason might be that maximum subject (61.66%) had knowledge for energy information given on FoPL. Contrast to this majority (30% to 59%) only subject able to interpreted other information like importance of expiry dates, calculation of total energy by serving information, means of %daily value, use of packed food based on %DV and quantity of saturated fat content, sodium content, sugar content etc which was similar to many study.[21,24,25] It is possible that in nutrition related topic ,especially reading food labels are not included in the current school curricula in India.[26] This might be the reason in our study that only 12.3% subjects were had good knowledge and many facts had also no statistically significant between different institution. Symbol knowledge assessment in this study, most of the participant able to find out for fortification, vegetarian and non vegetarianlogos. Our study also shows that there was no statistically significant in difference of knowledge level of logos. This might be possible that color and sign of logos help to identification. However few were able to write standard form of FSSAI and Indian nutrition rating. It might be because students don’t knew the authority for FoPL. But in Annamalai et al,[21] sindhu et al,[22] showing contrast to our finding that very few participants had knowledge of logos due to different methodology used for study. According to ICMR - NIN, Dietary guidelines for Indians 2024 reading the label can help to make an assessment of nutritional quality and safety of the food and make an informed choice. Serving size one of the most important pieces of information because all the information shown is based on the referred serving size. Nutritional facts that

are expected to be stated in the label and factors to be taken into consideration of making healthy food choices are energy, carbohydrate and sugar, fats, sodium, dietaryfibre and RDA. With out understanding of these nutritional facts consumers were confused to the information that provided on the food labels.[17] Sindhu et al,[22] statistically proved that single time intervention not change the state of confusion about information so there is need of provision of information, education and communication in regular basis.

Does understanding of FoPL information will change the attitude of subject for use of FoPL information?, Present study observed before intervention positive attitudes for different variable varied from 44.3% to 67.3% of the students. After intervention observed statistically significant in change of attitudes towards importance of FoPL, maximum and minimum consumption value per serving, use of information before purchasing food packets. Sindhu et al also had similar observation that attitudes towards food label before intervention was ranging from 22% to 33% of subjects. After intervention shows statistically significant improvement towards positive attitudes.[22] Study by Miller et al carried out with objective of determine whether increases in nutrition knowledge can promote great use of nutrition information on food labels reported that positive association between nutrition knowledge and food label use by type of measure.[27] The present study finding might guide education system of Chhattisgarh to develop curriculum regarding applicaion of FoPL in daily life for making healthier food choice through changing attitude . So the adolescents can apply knowledge by them to understand information onFoPLis practical importance.

Limitations

This study investigated only knowledge and understanding of FoPL information on theoretical basis among a limited number of urban going school adolescents. Therefore, the observation may have limited generalized. The study design did not allow for understanding for information use in the real shopping environment. The change in attitudes also investigated on questionnaires basis that also not reflect true attitudes changes. Participant feedback on FoPL regarding contents ample, easy or difficult to understand, time consumption for understand were obtained verbally during IEC session.

CONCLUSION

The overall as seen in our study that there was no differences of knowledge level among private or government school students ,increase in knowledge through IEC changes the attitude towards use of FoPL for choice of healthier packed food. Thus all the beneficiaries need to provide information education and communication for better utilization of FoPL for better choices of food to prevent non communicable diseases.With the government as the leading role for the change in cognitive attitude for change behaviour of population.This might be done by integrated in educational curriculum.

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