HEALTH AND NUTRITION CLAIMS ON FOOD LABELS – MEANS OF COMMUNICATION THAT CAN INFLUENCE FOOD CHOICES OF ADOLESCENTS

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ABSTRACT

Aim: Considering health claims on food labels are direct means of communication for food choices to the consumers; the current study aimed to assess their impact on food choices of adolescents.

Method: A cross-sectional study was conducted in Hyderabad, India among 111 school-going adolescents. A validated questionnaire with 36 closed-ended and four open-ended items was used to assess nutrition knowledge, perceived body image, use of food label and claim information: influence of claims on health risk perception and food choices of the participants.

Results: One third of the participants perceived themselves as overweight or obese. The participants often read (76%) label but use of label information for food choice is limited to 11-22%. Qualitative findings reveal that adolescent's associate claims with perceive healthiness of a product. Additionally, body image perception plays a significant role in decision making. Terms such as 'energy', 'weight reduction' as a claim creates skewed perceived healthiness of a product among participants.

Conclusion: The study findings establish health and nutrient claims are major determinant of food choices. Use of claim is linked with perceived weight status of adolescents. The claim is likely to be considered as a predictor of healthiness of the product if there are existing gaps in basic nutrition knowledge and understanding of nutrient content of label. This provides a window of opportunity to make adolescents nutritionally literate through nutrition communication intervention to properly interpret the health and nutrition claim to make healthier food choices.

***Keywords*:** Health and Nutrition claim; adolescents; perceived healthiness; positivity bias, packaged food

INTRODUCTION

Nutrition transition, a shift in dietary behavior, has been extensively studied in the context of the rising obesity epidemic (Popkin 2004; Popkin 2001; Popkin et al, 2012; Siddiqui et al, 2019). The key indicators of nutrition transition are less consumption of fresh fruits and vegetables in addition to eating high fat, salt, and sugar food(HFSS) (Afshin et al, 2019). It is estimated that about 11 million deaths from 1990 to 2017 across the world are attributable to dietary risk factors (Afshin et al, 2019). Worldwide, 1.9 billion adults, over 340 million children and adolescents aged between 5-19 years are overweight and/or obese (World Health Organization, 2020). Percentage of overweight among children and adolescents in India has grown from 0.4% to 2.4% among boys, and 0.2% to 1.6% among girls from 2000 to 2015 (Global Nutrition Report, 2020). The total prevalence of obesity among children was 2.3% during 2015-16 which increased to 4.9% during 2019-2020 (National Family Health Survey, 2019-2020).

Packaged and processed food consumption, eating away from home has also been noticeably higher than any time before (d'Amour et al, 2020). In India, the overall per capita sales of packaged and processed foods increased to USD 57.7 in 2018 from USD 31.3 in 2012 (Euromonitor, 2019). Worldwide, attempts are afoot to curb the consumption of HFSS foods to control and/or prevent the rise of obesity (WHO, 2013). The obesity epidemic prevention and management focus on personal changes along with policy regulation which can influence the food environment. Food label is an important communication tool to bridge the gap between policy and individual dietary behavior (Cowburn, G., & Stockley, L, 2005).

Health and nutrition claims displayed on the font-of-pack as a sentence or an image or phrase usually project association, suggestion and relation between nutrients, their functions and health benefits. Though claims are often used as marketing tool; they are also an important means of communication about the food to the consumer. Claims are of different types - disease reduction claim, nutrient function claim, nutrient comparative claim, non–addition claim and so on (FSSAI, 2018). Claims can lead to 'halo effect 'or 'positivity bias for certain food products, thus compelling consumer food choice (Fernan et al,2018; Williams,2005; Talati et al,2016; Benson,2018). For instance, a product claiming 'low in fat' not only projects an image of being healthier by being low in fat, but it could also lead to a belief that it could lower other risk factors of obesity. Similarly, 'positivity bias' could arise from product claims which highlight positive functions like 'helps in growth', 'equal to two glasses of milk'. Thus, a claim could increase the perceived healthiness of a product for the consumer and thus influence the choice and consumption.

In India, among the different age groups of consumers, adolescents are among the more frequent buyers of packed foods (Vemula et al, 2013, Saha et al, 2013; Ganpule et al, 2020). Adolescents are specifically targeted to intense marketing efforts since they represent future adult consumers. Health, nutritional or ethical claims are among the other marketing strategies like using popular figures, brand promotion and freebies displayed on food/drink labels to attract the consumers of this age group. (da Costa Louzada et al,2015; Dixon et al,2014; Jenkinet al, 2014; Talagala et al,2016).

Despite its importance, research on perceptions and understanding of food labels, especially the nutrition and health claims vis-à-vis their influence on adolescent food choices is limited and scanty (Bonsmann et al, 2010). This study aimed to assess adolescents' perceptions, understanding, intention and motivation to use nutrient and claim information on food labels; the influence of such claims on their food choices. This manuscript reports from the formative phase of a randomized control intervention study among school-going adolescents to promote the use of food label information for healthy food choices. This article particularly looks at health and nutrient claims, adolescents' perceptions about healthiness attributes of a product and the effect of these on their food choices.

LITERATURE REVIEW

Food selection relies on communication between the food environment and the consumer. Health and nutrition claims often work as predictors that influence the perception of overall healthiness of packaged food. Research suggests that consumers correlate claims with health benefits such as 'low in fat' as good for health; 'low in cholesterol' as maintenance of cardiovascular health; and presence of plant sterol as low in cholesterol and so on (Gezmen-Karadağ et al, 2018; Benson et al, 2019; Hung & Verbeke, 2019). A gaze behavior analysis using eye-tracking experiment revealed that the longer consumer's gaze at a claim, the more likely they purchase the product (Steinhauser et al, 2019). Looking longer at a claim was also significantly associated with nutrition knowledge - higher the knowledge longer the duration of gazing. However, higher nutrition knowledge and awareness regarding mandatory nutrition labelling policies are not necessarily associated with correct interpretation of nutrition or claim information. Nutrition and health claims can passively increase the believability towards the healthiness and policy compliance of a product (Klopčič et al, 2020; Hall et al, 2020)

The positive impact of claims on purchasing behavior is also reinforced by the marketing

strategy of pre-packaged food industries. Several studies analysed the presence of health and nutrition claims on pre-package foods in countries like UK, Netherlands, Germany, Slovenia, Spain, Canada, India, China, Malaysia, Iran, Sweden, Brazil, Argentina and many others (Mayhew et al, 2015; Hieke et al, 2016; Franco-Arellano et al,2017). Worldwide, approximately 30-60% of pre-packaged food products use health and nutrition claim. Almost 40% of the foods marketed towards children use one or more claims (Chacon et al, 2013; Pulker et al, 2017; Gracia et al, 2019). Experimental studies designed using real and hypothetical claim revealed children often prioritize products with nutrition and health claim without processing detailed nutrient information (Soldavini et al, 2012; Dixon et al, 2014; Ares et al, 2016; Madilo et al, 2020). These behaviours may lead to misleading food choices and higher consumption of HFSS foods (Benson et al, 2019; Kliemann et al, 2018; Rodrigues et al, 2017; Oostenbach et al, 2019). Studies examining confusion created by claims observed that almost 82% of the food samples from a market survey had nutrition and health claims but scored less healthy (Chacon et al, 2013; Pongutta et al, 2018). Similar findings were reported from countries like Africa, Australia, Brazil where almost half of product using claims were often low in nutritional value and had higher sugar or sodium content compared to packs without nutrition and health claims (Nishida et al, 2016; Pulker et al, 2017; Gracia et al, 2018; Duran et al, 2019). However, in the Indian context, there is limited evidence owing to scanty studies that have relation between perceived healthiness based on claim and influence on purchasing behavior. This study intends to explore the influence of health and nutrition claims on the food choices among adolescent consumer.

OBJECTIVES

i) Assessing intention and motivation to use health and nutrition claims by school-age adolescents
ii) Assessing impact of health and nutrition claim on the choice and consumption of pre-packaged food.

METHODOLOGY

Study design, location and participants: This cross-sectional study was conducted among adolescents studying in co-educational English medium schools of Hyderabad, Telangana, India. The study participants were in the age group of 12-13 years studying in grade VIII.

Questionnaire administration and data collection: A validated questionnaire (Saha et al, 2014) was used for data collection and the participants filled in the questionnaire in the presence of an investigator. The questionnaire had several sections focusing on - perceived body weight status, frequency of consumption of packaged foods, nutrition knowledge, knowledge and use of food label information. However, this article particularly focuses on the qualitative assessments of the data collected against open-ended questions.

The study protocol was cleared by the Institutional Ethical Committee (IEC) of ICMR-National Institute of Nutrition (ICMR). Written informed consent was obtained from the participants, their parents and the school principals.

The study covered over 350 participants, of which 111answered the open-ended questions. Thus, this manuscript reports data from those 111 participants' responses only.

Data Entry and analyses: Based on the responses to the pre-coded questions, the data were entered in Microsoft Excel. Responses to the open-ended questions were transcribed verbatim from the survey forms into Microsoft Word for quantitative and qualitative data analyses, respectively. Demographic details, nutrition knowledge, use of label information and claim as purchase determinants, and consumption frequency were assessed using descriptive statistics on Statistical Package for Social Sciences (SPSS) Version-21. The questionnaires provided a list of nutrients (carbohydrate, fat, protein, sodium, allergen, fiber) and were pre-coded. Responses for nutrient were coded as per the list in the questionnaire and reasons for preferring nutrient while choosing food were read , and were categorized further into positive and negative wording. 'Fear' or 'scare' were categorized as negative perceptions. Motivation, intention to use or learn more about any nutrient was considered as a positive attribute.

Names of the packed foods that were reported to have been purchased for health reasons were recorded; they were re-coded as per their

generic product name or food type. Claims reported by the participants were categorized as function claim, ingredient claims and risk reduction claims as per FSSAI classification (FSSAI, 2018). Healthiness attributes reported by the participants were analysed based on the statements by the participants, and they were categorized as positive and/or negative perceptions against the categories of claims (*Table 1*).

Table 1:-Data sorting

Type	Nutrient and its effect	Preferred food product	Claims and its influence on purchase decision
Responses used	Statement by participants about nutrient they want to consider for food choice.	Brand name used in statement , coded into main food product	Statement showing specific claim participants read and use for food purchase
Category	Positive influence Negative influence	Biscuits Breakfast cereal Heath drinks Bread Energy drink	Function claim Disease reduction claim Ingredient claim

RESULTS

***Demographic details of the participants*:** Among 111 participants, 55.9% were boys. Of all the participants about 47% felt their weight status was appropriate, but over a quarter each perceived themselves to be underweight or overweight (*Table 2).*

Table 2: Number of participants and perceived weight status

Gender and perceived weight status		Percentage
Number of participants = 111	Gender	N= 111 Boys=55.9 girls=44.1
Perceived weight status	Appropriate	46.8
	Under-weight	23.4
	Slightly overweight	27.9
	Obese	1.8

Frequently consumed packaged foods: Consumption frequency for commonly consumed products like biscuits, chocolate, health drinks and others were 84.7%, 85.6%, 79.3% respectively *(Table-3)*.

Table 3:- Frequency Percentage of commonly consumed food product

Categories of foods commonly consumed (everyday/one/twice a week)	Respondents (%)
Chocolate	85.6
Biscuits	84.7
Cakes	44.1
Breakfast cereal	79.3
Snacks	86.5
Jams, jellies	51.4
Aerated drinks (cold drinks)	55.9
Health drinks and powder	79.3
Fruit juices and powder	75

Label information as a purchase determinants: Label information and claims act as the determinants of purchase of the above-mentioned food products. In the current study, label and claim information were reported as an important determinant of choice of chocolates, biscuits and health drinks by 11.7%, 18%, and 22.5% of the participants (*Table 4).*

Table 4:- Label and claim as determinants of choice of commonly consumed food products

Food categories	Label & claim usage for food choice (%)
Chocolate	11.7
Biscuits	18.0
Cakes	7.2
Breakfast cereal	17.1
Snacks	12.6
Jams, jellies	14.4
Aerated drinks (cold drinks)	11.7
Health drinks and powder	22.5
Fruit juices and powder	21.6

***Knowledge of nutrition and label information*:** The Nutrition knowledge assessment section of the questionnaire had two components - first was about the major nutrients present in common food items and second section enquired about health and nutrition knowledge. The correct responses for each question are given in Table 5. Further, knowledge of basic food label information and the frequency of label use are given in Table 6. The general nutrition knowledge varied based on the question, the correct responses were

varied from the lowest 8.1% to the highest 87%. Almost 76% of the participants always or sometimes use the label information (*Table 5).*

Table 5:-Nutrition awareness, food label use and knowledge of basic label information

Item	Questions	Percentage of correct response (%)
Nutrition knowledge (commonly used food rich in nutrient) (percentage of correct responses)	Egg	47.7
	Milk and milk product	50.5
	Fruits	64.9
	Green leafy Veg	66.7
	Cooking oil	75.7
	Aerated (cold) drinks	50.5
	Ghee, butter	8.1
	Chips	45.9
Nutrition and health knowledge (percentage of correct responses)	Necessity of balanced diet	87.4
	Excess fat and health problems	73.9
	Fiber in fruits and vegetable	84.7
	Excess salt and hypertension	50.5
	Childhood food habits and effect on adult life	46.8
	Unit of energy	18.9
	Cholesterol in vegetable oil	29.7
	Name of common allergen	23.4
	Trans fat in bakery product	63.1
	Trans fat in vanaspati	27.9
How often do you read label	Always	33.3
	Sometime or for a new products	43.2
	Only occasionally	16.2
	Rarely	7.2
Knowledge of label information	Brand name	89.2
	Manufacturing date and address	89.2
	Lot / batch code	58.6
	Expiry and best before date	85.6
	Ingredient list	81.1
	Nutrient declaration	50.5
	Quality symbols	47.7
	Veg/ Non-Veg symbols	65.8

Use of health and nutrition claims: This section is based on the analysis of responses to open-ended questions - 'what information you would like to see on label and why?'; 'do you buy any product because of its health claim and if yes which claim?'

Based on the responses against open-ended questions the answers have been presented under two major themes - (i) intention to use nutrient information based on positive motivation for health and (ii) intention to use nutrient information based on risk perception and its effect on the purchase of the packaged food.

'Health', 'energy', 'good for health', 'keep our body healthy',' 'to know about healthy food', 'main nutrient of our body' etc. were the most common reasons reported for reading information on carbohydrates, protein and fiber. Protein was the most sought-after nutrient followed by carbohydrate. Few also mentioned reading the information on fibre content of the foods. The responses were not significantly different between the genders. Both boys and girls recognized the importance of carbohydrate, protein, fibre and strongly associated them with good health

"Not to become fat"," it will make me fat", "I am already fat so should check", "I need to stay thin not become fat" were some of the responses stated as the reasons for reading the information on the fat content on the food label. Fat was the most frequently mentioned nutrient of concern. Regarding the allergen information, a few participants reported that they were allergic to certain foods, thus they were in the habit of reading allergen information on the label. The others were not aware of that such information is provided on the label. However, some of them mentioned that those who are allergic to certain foods should make sure that they read allergen information on the labels before choosing the foods. Sodium was also listed as a nutrient of concern. "it will increase hypertension", "it will make us ill" were listed as the reasons to look for sodium information on the nutrient panel.

Health claims (nutrient function claim, risk reduction claim) were found to have an impact on purchase. Based on the responses, the food products can be divided into three major food types-health drinks and powder, breakfast cereal and biscuits. Claims that were mentioned by the participants which led to

purchase or frequent consumption were-"I can grow my height and get energy and heath'', "it is tasty as well as gives energy. ''If I eat before coming to the school, I can easily understand what the teacher is saying'', "it makes me stronger, taller, healthier'', "I buy this health drink to become tall as I was short in my class", "gives me energy'', "we can become slim'', "I can stay thin'', "they say it has energy of two glasses of milk'', "improves memory'', "makes bone strong" etc. (*Tables 6 & 7)*

Table 6-Nutrient and reasons associated with choice the nutrient

Nutrient	Statement showing Intention/motivation/Health concern
Positive association/ perceived benefit- Carbohydrate Protein Fiber	*''I like protein.''* *''I like protein for body building''* *''Because they are good for health. I want to know if it helps in nutrition and are they energetic?''*
Negative association/ Perceived risk - Fat / Sodium	*''I am thin. I would like to be bit Fat. So I check that.''* *''I want to know about Fat because I know Fat is not good for health''.* *''Carbohydrate can be useful but Fat is dangerous''* *''Also, sodium because if its more can become high blood pressure''*
Allergen	*''I will get allergy from some new food I should check allergen*
Any other (specify)	*''Doctor said to take more calcium''*

DISCUSSION

The present study attempted to assess the effects of health and nutrition claim on packaged food consumption based on perceived healthiness. Though there is evidence that food marketers also use health and nutrition claims to promote their products among children and adolescents (Jenkin et al, 2014; Ueda et al, 2012); there is limited evidence how adolescents in India perceive healthiness of packaged foods. Health-related information and healthiness is often understood from a personal perspective. Few studies have indicated that self-perceived body image and perceived health status of adolescents have an impact on their dietary behavior (Hedaoo et al, 2020; Gavaravarapu et al, 2015).This study findings established that the motivation to consume healthy foods can prompt adolescent consumers to look for attributes such as health and nutrient claims on a packaged food product to choose their foods. The current study proves that perceptions about body image and self-perceived weight status also determine their beliefs on the functional ability of certain nutrients or negative health impacts of the others. Further, the beliefs or risk perceptions also determine the personal need for seeking health information about the foods (Wills et al, 2012).

A closer look at the outcomes of this study shows that the adolescent consumers who read the nutrient information or claims on the

Table 7:- Responses provided for use of claim information used for selection of packaged foods by the study participants

Type of Food product	Statement mentioning health and nutrition claim	Health influence
Health drinks and powder	*''I will buy this health drink to become tall as I was short in my class.''*	Helps in growth
	''Because this health drinks contain healthy nutrient and fiber''	Rich in nutrient
	''We will feel fresh and by drinking this health drink our height will increase. These things keep us healthy and fit.''	Height, fitness
Breakfast cereals	*''it is tasty as well as it gives energy''*	Concentration
	'If I eat before coming to the school, I can easily understand what the teacher is saying''	Thinness
	''Oats is very healthy. By eating oats I can be slim.''	
	''It is very useful because it is good for bone and brain''	Bone and Brain health improvement
Biscuits	*''Yes. In this biscuit they say it contains two glasses of milk. That's why I but it.''*	Milk equivalence
	''I buy milk biscuits because they say we will get more energy''	Energy
Others (ChawanPrash, bread, cake, butter milk, energy drink)	*'' butter milk for mineral and energy''*	Energy
	''it(energy drink) has less Fat, high protein and gives us energy''	Rich in nutrient

labels, consider them as two broad categories – (i) healthy nutrients and products that claim to deliver 'healthy nutrients' and/or those that can reduce the risk of obesity and (ii) nutrients of concern and/or product which relates to health risks such as obesity.

A simplistic observation offers a parallel relation between motivations to consume more protein and less fat and the choice of foods that claim to provide health benefits or weight reduction. The findings also indicate that body image perception is an important factor for food choice. Around a third of the participants consider themselves overweight or obese and this health risk perception is also an important determinant in reading the claims and nutrient information on food labels. A study among supermarket shoppers in Delhi and Hyderabad also reported that consumers look for claims if they are concerned about certain health risks like obesity, hypertension and diabetes (Vemula et al, 2003).

To project their foods positively, manufacturers often highlight one important nutrient and their benefits. In contrast, the product can have other nutrients of concern which may contribute to increased intake of nutrients of concern like fat, sugar or salt.

Participants in the study have often attributed positive health connotations to the term 'energy'. In this study, any claim based on 'additional energy' or 'source of energy' was also considered by the participants as a positive attribute contributing to healthiness of the food. In contrast, consumption of energy-dense foods coupled with lack of physical activity can lead to overweight and obesity. All the participants have indicated carbohydrate as useful or beneficial and fat as the reason for concern.

However, the Dietary Guidelines for Indians suggest that fat is an important nutrient for both cognitive and physical growth/ development of adolescents (Nutrient requirement for Indians, 2020). This shows a clear gap between information and perception. Therefore, targeted nutrition education to communicate about functions of nutrients is necessary for label information to be effectively used for food choices. Even though carbohydrate is the main energy producing nutrient of our diet, most of the packaged foods (especially foods like biscuits, bread and cake) consist of refined flours as the main ingredient which in turn can contribute to excess energy consumption. The link of energy and obesity needs clearer understanding especially in the context that energy is considered as a positive attribute owing to its positive meaning when it is translated into local Indian languages (as Shakti, which also means power).

Similarly, consumption of breakfast cereal which specifically claims slimming effect for adults has a great influence on adolescents' food choices. It raises concerns about the adolescents' ignorance about the added sugar or free sugar in such products and their inability to process the claim information against the actual nutrient content declaration provided on the back-of-the-pack label. Most of participants have mentioned that consumption of health drinks (names not mentioned for ethical reasons) could increase their 'concentration power', make them sharper and taller. The findings indicate that the claim is creating a 'positivity bias' (Talati et al, 2016) among adolescents and leading to a dietary behavior from over-emphasis on specific nutrient functions over a balanced menu.

Food label information, especially the nutrient content declaration is mandated on the labels to help consumers make informed and healthy food choices. However, there are concerns that adolescent consumers find the information too technical to understand (Saha et al, 2013). This could be one of the reasons why they rely on claims to choose foods as claims appear to create positivity bias and seem to make understanding easy. This study shows that most adolescents (76%) read food label information, but those who use label information for their purchase decision are just about 11-22%.

The gap between reading the label information and using such information as a purchase determinant is still wide. Claims can create a passive path-way for product purchase guidance if the consumers cannot interpret the nutrition information. But claims tend to highlight a particular functionality or nutrient and not the overall nutritional value of the food. These points to the enormous scope for

enhancing nutrition communication targeted at adolescents for making the food label reading a necessary skill to promote healthy food choices.

CONCLUSION

Majority of the participants reported that they purchased or consumed pre-packaged foods. Among them, about 75 percent of participants read or check the label information quite often. Reading label information is not proportional to the use of label information as a purchase determinant.

The identified gap is often masked by relying on brand name, tastiness of the product, less understanding of micronutrients' function in health management, over-emphasis of calorie and protein consumption and perceived healthiness based on health and nutrition claim. This article has explored the relation between perceived weight status and the effect of claim on food choice of adolescents. The findings highlight positivity bias on the part of adolescents and a passive influence of claims on the food choice without considering the detailed nutrition information. This points to the need for a multi-faceted awareness initiative to encourage healthy food choices backed by proper understanding of growth and development in adolescent period, role of various nutrients and use of food label and claim information as a tool for food selection. The involvement of stakeholders like teachers, parents and policymakers are needed for strategic combat against perception driven dietary behavior at an early age. Inclusion of nutrition science in school education is of utmost importance.

LIMITATIONS

This study investigated perceptions on health and nutrition claims as the determinants of food choice among a limited number of urban, school-going adolescents. Therefore, the findings may have limited generalizability. Moreover, they represent self-reported responses of the participants and the possibility of reporting ideal or desirable responses cannot be ruled out. The current study enquired about the general health and nutrition claims that might have impacted participants' food choices, but the study design did not allow for understanding of label use or claim information use in the real shopping environment. The questionnaire also enquired about the perceived body weights but no attempt was made to corroborate them with the actual anthropometric assessment.

FUTURE SCOPE

The limitations are linked with the possibilities. This study indeed offers a substantial contribution to research in the area of food claims information driven food choices, which very sparse in the Indian context. The use of nutrition and health claims in the real-life shopping environments can provide the actual point-of-purchase behavior. Studying the parents' and other peers' opinions along with the adolescents can offer more diverse and triangulated information on adolescents' food choices. Studies using eye-movement tracking technology would be a useful continuation in the future direction to assess the time spent on reading the claims and other aspects of label information vis-à-vis food choices. The effect of print and digital media advertising, which also harps on health and nutrition claims on food choice, would be an exciting addition to the literature. Reading and interpreting claims with the help of nutrient content declaration on labels can add an extra edge to the label reading skills of the adolescents. The inclusion of courses on use of label information and interpretation of the health and nutrition claims in the curriculum will go a long way in building skills and promoting healthy food choices.

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