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Perception of Sugar Content in Food Labels among Supermarket Consumers in Chennai City – A Cross Sectional Study

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Abstract

Objectives: The aim of the present study was to assess the knowledge on sugar content in food labels among the super market users in Chennai city. **Material and Methods:** A study was designed as a descriptive cross-sectional study which was conducted among a sampled population of supermarket consumers in Chennai city. Chennai city was divided into 3 zones based on the parliamentary assembly constituencies and from each zone two supermarkets were randomly selected. Data was collected using a closed ended questionnaire. Data collected was tabulated and analyzed using SPSS software package version 16. **Results:** Majority (71%) were not aware of the rules guiding the display of contents in the food products which they purchased. 46.5% of the participants were more interested in the carbohydrate and protein content of the food products while only 13.2% were interested in the sugar content. About 65% were aware of the positive association between excessive sugar consumption of sugar and incidence of various diseases. Mere 51% of the study participants expressed their interest to know more information regarding the risk benefit of sugar consumption. **Conclusion:** Based on the findings of this study, it can be concluded that the majority of the supermarket consumers in Chennai city were not aware of the display of contents in their purchased products, including its sugar content. Though majority of them were aware of the association between sugar consumption and disease, they did not perceive sugar in the purchased food products as a potential risk factor.

Keywords: Food Labeling, Perception of Sugar Content, Product Labeling, Sugar, Sugar Content, WHO Recommendations

1. Introduction

The burden of chronic diseases is rapidly increasing worldwide. It has been projected that, by 2020, chronic diseases will account for almost three-quarters of all deaths worldwide, and that 71% of deaths due to ischemic heart disease (IHD), 75% of deaths due to stroke, and 70% of deaths due to diabetes will occur in developing countries[1]. The number of people in the developing world with diabetes will increase by more than 2.5-fold, from 84 million in 1995 to 228 million in 2025. On a global basis, 60% of the burden of chronic diseases will occur in developing countries. Indeed, cardiovascular diseases are even now more numerous in India and China than in all the economically developed countries in the world put together[2]. As for overweight and obesity, not only has the current prevalence already reached unprecedented levels, but the rate at which it is annually increasing in most developing regions is substantial[3]. The public health implications of this phenomenon are staggering and are already becoming apparent. Current literature clearly proves the causal relationship between sugar consumption and obesity and its related diseases and recent studies have also shown that reduction in sugar consumption is associated with reduction of obesity and obesity-related diseases[4].

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Beyond the appropriate medical treatment for those already affected, the public health approach of primary prevention is considered to be the most cost-effective, affordable and sustainable course of action to cope with the chronic disease epidemic worldwide. The adoption of a common risk-factor approach[5] to chronic disease prevention is a major development in the thinking behind an integrated health policy. Modern dietary patterns and physical activity patterns are established risk behaviors that travel across countries and are transferable from one population to another like an infectious disease, affecting disease patterns globally.

Promoting healthy diets and lifestyles to reduce the global burden of non-communicable diseases requires a multi sectoral approach involving the various relevant sectors in societies. In this context Food labels are an important public health tool that is used to promote a balanced diet; and hence enhance public health and well being. Food label information assists consumers to better understand the nutritional value of food and enables them to make healthy, informed food choices based on the relevant nutrition information[6].

In an age of increasing nutrition awareness and the health implications of suboptimal nutrition, the World Health Organization[7] has launched a crusade to encourage consumers to adopt healthier lifestyle behavior, and has established worldwide plans and policies to encourage healthier eating patterns. These policies help to enforce rigorous guidelines pertaining to food labeling as an essential way of presenting good nutrition information to people.

In India all the products standardization and certifications are governed by the Bureau of Indian Standards, the national standards organization of India. The disclosure of information on food labels in India is primarily governed by the Prevention of Food Adulteration Act, 1954. However, recent amendments on packaging and labeling of food under part VII of the Prevention of Food Adulteration Rules, 1955, and Indian Food Law i.e., Food Safety and Standards (Packaging and Labeling) Regulations, 2011 has mandated to disclose the health and nutritional claims on the food labels along with basic information.

With increasing incidence of non communicable diseases, and numerous studies showing the association between food habits and non communicable diseases, adequate knowledge of food labels among consumers will help them make better choices on their health and lifestyle practices[8]. Among the many dietary agents, sugar content assumes significance as it is associated with a variety of disorders related to Cardiovascular system, Endocrinal health and Dental Health[9-11]. Hence assessing the consumer's nutrition knowledge level about dietary sugar and their attitudes towards selecting foods based on their nutritive value is important.

2. Aim and Objectives

The aim of the present study was to assess the knowledge on sugar content in food labels among the super market users in Chennai city.

The objectives of this study was to find out the various factors affecting the purchasing choices of super markets users, their knowledge regarding food and nutritional labels in products sold, and in particular to different types of sugar and its content, and their understanding on the negative impact of these sugar on the general health.

3. Materials and Methods

The present study was a descriptive cross-sectional study conducted among a sampled population of supermarket consumers in Chennai city. Ethical clearance to conduct the study was obtained from the Institutional review board of Sri Venkateswara dental college and necessary permission to conduct the study was obtained from the concerned supermarket authorities. Further voluntary consent to participate in this study was obtained from all the study participants after explaining the objectives and nature of the study.

For the present study, Chennai city was divided into 3 zones (North Chennai, Central Chennai and South Chennai) based on the parliamentary assembly constituencies and from each zone; two supermarkets were randomly selected from those present in these zones. The list of supermarkets for each zone was obtained from the Corporation of Chennai. For the present study, those supermarkets which sold a variety of consumer products, including food and beverages and those which allowed the consumer to inspect the product and make their informed choices before purchasing them were only included. Further, a supermarket consumer was defined as one who was above 18 years of age and had shopped in the defined supermarket within 30 days of the study.

Data for the present study was collected using a closed ended questionnaire which was content, and face validated. The questionnaire contained 24 closed-ended question related to demography of the consumer, their shopping frequency and the products they shop at the supermarkets, their knowledge and perception regarding the sugar content in food labels, the Bureau of Indian Standards (BIS) norms for food labels marketed and the relation between sugar content of food items and their health implications. The questionnaire was thoroughly reviewed by a panel comprising health care professionals (3 dentists, 3 general physicians, 3 community health specialists). The purpose of this content validation was to ensure that the questions were not ambiguous, and content was appropriate. Based on reviews from the panel members, modifications were made in the questionnaire. A convenience sampling was followed to sample the supermarket population. The questionnaire was self administered by the principle investigator to the sampled population of supermarket consumers on a particular allotted day for the particular supermarket, after explaining them the purpose of the study. The participants took approximately 20 minutes to complete the survey. The questionnaire was administered only in English language.

Data collected was entered on a Microsoft Excel sheet and analyzed using SPSS software package version 16. Descriptive statistics were represented using frequency and means. Chi square test was used to test the association between mean monthly income of the study participants to their perception. Alpha error was assumed as 5% and P value less than 0.05 gave a statistically significant association between the variables.

4. Results

The present study was conducted among a sampled population of supermarket consumers in Chennai city regarding their perception towards sugar content in food labels. Data was collected from the consumers visiting six different supermarkets in Chennai over a period of one week. 450 consumers were approached for this purpose and among them 370 completed the questionnaire. Among the 370 consumers, 246 were females and 124 were males. The response rate was 83%. The mean age of the participants was 30.7 years.

Table 1 shows the responses of the study participants regarding their knowledge and attitudes towards sugar content in food labels and their pattern of sugar consumption. Among the study participants, 49.2% had visited the supermarket 2 to 5 times within the last 30 days. Ease of getting everything under one roof and good bargain were perceived as the main advantages by the study participants for shopping in a supermarket. Food and beverage products were the most common product shopped, and 62% of the study participants rated themselves as occasional and frequent buyers of food products in a supermarket. Though more than 62% of the participants mandatorily checked the price and offers associated with the food products during their purchase, majority (71%) were not aware of the rules guiding the display of contents in the food products which they purchased. Further, more than 60% had not checked the content of the purchased food products. 46.5% of the participants were more interested in the carbohydrate and protein content of the food products while only 13.2% were interested in the sugar content. Though there existed some confusion in the knowledge regarding the form of sugar content in the food products sold, many (65%) were aware of the positive association between excessive sugar consumption of sugar and incidence of various diseases. Many of the study participants were also not aware of the WHO recommendations for daily sugar consumption and 69% were also not aware of the terms like "artificial sweeteners" and "non-caloric sweeteners". Mere 51% of the study participants expressed their interest to know more information regarding the risk benefit of sugar consumption.

5. Discussion

The Indian retail industry has emerged as one of the most dynamic and fast-paced industries due to the entry of several new players. It accounts for over 10 per cent of the country's Gross Domestic Product (GDP) and 8 per cent of the employment. India is the world's fifth-largest global destination in the retail space[12]. The supermarket industry has been recently introduced in India's retail sector and they are increasing their market share by attracting consumers on the basis of price and atmospherics.

In recent years there has been a considerable growth amongst the middle sector class in India, increasing their

Table 1. Distribution based on the responses of the study participants regarding their knowledge and attitudes towards sugar content in food labels and their pattern of sugar consumption

Q No	Consumers perception towards sugar content in food labels	Responses	%
1	Number of supermarket visits within 30 days	Once	28.65
		Two to Five times	49.19
		Five to ten times	18.11
		More than ten times	4.05
2	Self rating of their frequency of supermarket use	Not at all	0.27
		Rare	36.47
		Occasional	40.27
		Frequent	19.74
		Very frequent	3.25
3	Self rating of their shopping experience	Very Bad	7.84
		Bad	11.89
		Average	57.03
		Good very Good	23.24
4	Perceived main advantages of shopping in a supermarket	Choice of brands available	44.87
		Ease of getting everything under one roof	22.97
		Good bargain of prices	10.27
		Your ability to read and check the content and details like manufacturing and expiry dates etc	8.92
		Ease of accessibility and convenience	11.08
		Any others	1.89
5	Choice of materials purchased in a supermarket	Food and beverages	22.70
		Vegetables and fruits	13.51
		Grocery items	29.46
		Household appliances and articles for daily use	18.92
		Soaps and detergents	14.32
		Any others	1.09
6	Self rating of frequency of buying food products	Not at all	2.16
		Rare	33.24
		Occasional	41.62
		Frequent	21.08
		Very frequent	1.9
7	Factors checked before buying in a supermarket	The brand	20.81
		Any offers associated with it	31.35
		Its price	31.62
		The date of manufacture and expiry	13.51
		The content as displayed by the manufacturer	2.16
		Others	0.54
8	Knowledge regarding safety regulatory body in India for display of contents in the food product	Yes	28.38

		No	34.05
		Don't know	37.57
9	Whether checked the content of food products	Yes	39.2
		No	60.8
10	Perception regarding the importance of display of content	The consumer needs to know the content of the product which he/she is consuming	59.46
		Need to know the caloric content of the food product consumed	18.92
		Need to know the sugar content of the food product consumed	9.19
		Need to know the nature of the preservatives and additives added in the food product consumed	10.54
		No, it is immaterial for the consumer to be aware of the content of the food product bought and consumed	1.89
11	Factors of interest in food content	Caloric content	18.11
		Sugar content	13.24
		Main ingredients (Carbohydrate and protein content)	46.49
		Added preservative and additive content	4.6
		Fat content	9.73
		Presence of trace elements like minerals and vitamins etc	5.68
		Any others	2.15
12	Perception that majority of the food products sold in the market have some form of sugar	Yes	48.38
		No	30.54
		Don't know	21.08
13	Awareness of the ill effects of the excess consumption of sugar	Yes	56.22
		No	27.84
		Don't know	15.94
14	Awareness of the association of sugar consumption and obesity	Yes	40
		No	21.08
		Don't know	38.92
15	Awareness that consuming excessive sugar in food products can lead to many diseases	Yes	65.68
		No	9.19
		Don't know	25.13
16	Perception that there exists difference in the sugar consumed at house and those consumed through food products	Yes	34.32
		No	34.59
		Don't know	31.09

17	Knowledge about World Health Organization recommendation for daily consumptions of sugar	Yes	17.03
		No	34.32
		Don't know	48.65
18	Knowledge regarding recommended daily consumption of sugar	Less than 10% of daily caloric consumption	25.95
		Less than 20% of daily caloric consumption	36.76
		Less than 25% of daily caloric consumption	20.27
		Less than 50% of daily caloric consumption	17.02
19	General source of information of the study participants	Newspaper	14.32
		Internet	39.73
		Books and periodicals	10
		Advice from your physician	6.76
		Advice from your friend or a person of repute and knowledge	7.3
		Television programs	10.27
		Specific health magazines	10.27
		others	1.35
20	Whether the study participants had any diseases or health issues.	Yes	20.27
		No	79.73
21	Whether family members of the study participants had any diseases or health issues	Yes	29.46
		No	70.54
22	Whether study participants looked specifically for sugar content in the food products	Yes	22.97
		No	77.03
23	awareness to terms like "artificial sweeteners:" and "Non-Caloric sweeteners"	Yes	29.46
		No	27.57
		Don't know	42.97
24	Their interest in knowing more information regarding the benefits and risks of sugar consumption	Yes	51.08
		No	48.92

spending power. With significant changes in lifestyles, new taste and preferences have developed amongst the Indian consumers. As people gain more purchasing power, the market is shifting from price linked to value linked where more importance is given to design, atmosphere and other facilities. Today supermarkets are offering a new shopping trend to all generations by providing services that offer convenience and experience along with great value[13]. As a result, the whole idea of all commodities available under the same roof is increasing the consumer base of supermarkets in India. This study was conducted on sampled consumers of certain supermarkets in Chennai, a metropolitan city in India, to provide insight about their perception towards sugar content in food labels and their attitude towards consumption of sugar in food products marketed.

Majority of the participants in the present study visited the supermarkets 2 to 5 times within the last 30 days, and there existed a statistically significant association with their visits and their mean monthly income. These findings were similar to the general trends to supermarkets users in India, which reflects the changing shopping trends of

Indian population and their increasing purchasing power. In fact, India's large and aspiring middle class of 75 million households or 300 million individuals want products that are value-driven. The country's 500 million people under the age of 25 have access to more money that has additionally resulted in independence, aspirations and a demand for products[14]. The mean age of the participants in the present study were 30.7 years, which reflects the typical supermarket consumer of the present era.

Food and beverages were the most commonly purchased products among the participants of this study. Various studies have shown that food choices made can have an important impact on one's health. However, expert opinions continue to change about which and how much of these foods are optimal. Regularly eating whole grains (like 100 percent whole wheat bread, steel cut oats, and wild/brown rice) has been shown to help weight loss and lower the risk of diabetes. Similarly, consuming refined grains and added sugar has been associated with weight gain and increased risks of diabetes[15].

In India, food labeling serves as a primary link of communication between the manufacturers on one hand and distributors, sellers, and consumers on the other hand. By way of labeling the manufacturer introduces his product to his distributor or seller and to the target consumer of his product by providing all the information regarding his product on the label. Every packaged food article for the domestic use has to be labeled in accordance to the related Indian Food Law i.e. Food Safety and Standards (Packaging and Labeling) Regulations, 2011, notified by Food Safety and Standards Authority of India (FSSAI)[16]. However, majority of the participants in the present study checked the price and the offers associated with the product purchased rather than the content displayed in their food labels.

Gulaiti S *et al.*,[17] in her study had reviewed data regarding sugar consumption in India and review potential relationships of sugar intake with obesity and metabolic perturbations in humans. In this context it is important to mention here that Indians already have higher non-esterified fatty acids, insulin resistance, hepatic steatosis, and dysglycemia than white Caucasians. All these metabolic dysfunctions could be further exacerbated by indirect (through obesity) and direct effects on multiple metabolic organs. Further, Indians usually increasingly consume traditional sweets along with sweetened sugar beverages, and westernized sugar-loaded food items, which has caused a rapid rise of obesity and Type 2 Diabetes Mellitus among this population. In our study, though majority were aware of this association, only few were aware of the daily recommended sugar intake. Further the participant of this present study perceived sugar consumed at home was different to that consumed through food products and many were not aware of terms like "artificial sweeteners" and "non-caloric sweeteners". These facts throw light on the gap of knowledge existing among the consumers about the risk benefit of sugar consumptions which can also have implications on their choice of food products purchased. Hence efforts should be directed towards increasing the knowledge of consumers regarding the importance of food labels, methods of reading them and using them as a tool for purchasing their choice of food products. Display of pictorial depictions regarding the contents of the food products sold shall also enable the consumers to make for informed choices.

Manthena JSK et al. conducted a study to assess the current practices pertaining to health and nutrition claims on food labels in India. It was found in this study that though 80% of labels were in compliance with the guideline laid, 68 to 78% made nutritional and health claims. Since nutrition labeling is a relatively new concept in India, regulations and testing are necessary for consumer protection and to ensure that products are able to meet their claims[18]. Significance of a language barrier for labels is a potential confounder for public. May be this has to addressed by FSSAI to improve the quality of life of the population. In the present survey, questions were not translated in to the local language Tamil; this is one the main limitation of this study. There are chances that content might be read in the local language and not reported in the study.

6. Conclusion

Within the limitations of the present study, it can be concluded that the majority of the supermarket consumers in Chennai city were not aware of the display of contents in their purchased products, including its sugar content. Though majority of them were aware of the association between sugar consumption and disease, they did not perceive sugar in the purchased food products as a potential risk factor. This finding assumes significance as many food products consumed have a variety of sugar

content in them. Though awareness is created by media among consumers already, maybe it can be mentioned in the BIS, FDA, FSSAI activities along with labeling. Hence efforts should be focused to facilitate the consumers' awareness towards the importance of reading and usage of food labels, including its sugar content.

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