



**ORIGINAL RESEARCH PAPER**

**Health Science**

**A CROSS SECTIONAL STUDY ON CONSUMER AWARENESS OF FORTIFIED FOODS IN VADODARA CITY**

**KEY WORDS:** Food Fortification, Consumer Awareness, Micronutrient Deficiency, Food Fortification logo

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**ABSTRACT**

The growing Micronutrient deficiency rates in India and worldwide have been a cause of concern. Recent National Family Health Survey (NFHS) reports have shown that the micronutrient levels are affecting the overall health of the individuals. The diet that the population is having at large is not serving the daily amounts of micronutrients in the substantial amounts, thus, to address this, Government of India (GOI) and The Food safety and standards Authority of India (FSSAI) have implemented food fortification program in India, focusing on five staples, namely rice, wheat flour, oil, milk and salt. The present study was carried out in the department of foods and nutrition in Vadodara, Gujarat, amongst 375 parents who were responsible for buying groceries for their families. The aim of the study was to assess the knowledge of the population regarding fortified foods using google forms. The study revealed that only 33% of the subjects, knew about the term fortified foods, however on asking about its identification attribute, only 28% were able to give the correct answer. Most of the subject (89) subjects marked correct response for the fortification logo. However, the knowledge regarding the food sources of fortified foods was lacking amongst the study subjects. Efforts should be made to create awareness about the new fortified foods and its benefits at large scales through different media channels.

**INTRODUCTION**

India is a home of 138. 85 crores people according to recent UN report. (World meter, UN as on 15<sup>th</sup> March 2021) Health of the population is important for every country for improving the economic performances and thus the productivity of the nation. Thus, it becomes important for every nation to monitor the health of the individuals and design strategies to overcome every health related issues that the country is facing. (Raghupathi, 2020). One of the major health problem that the world is facing with, is micronutrient deficiency. Everybody knows how important are the various macronutrients for the development and functioning of the body, but equally important are the micronutrients like Vitamin A, Vitamin D, and B12etc. Which are required in tiny amounts. Micronutrient deficiency is a growing global health, adding onto the burden of various health related problems like anaemia, affecting physical and mental development in children, vulnerability of diseases, night blindness etc. It is also defined as 'Hidden Hunger' as the signs of deficiency are not visible. According to World Health Organization (WHO) nearly two billion people worldwide are suffering from micronutrient deficiency (Ritchie and Roser, 2017).

Researchers have revealed that nearly 50-60% of the preschool children and an equal number of women in India are anaemic, (Gonmei and Toteja 2018), 62% of Indian Population have low levels of Vitamin A and 50-94% people in different states of India are suffering from Vitamin D deficiency. (GAIN, India 2018). According to NFHS-4 (2015-2016 data), micronutrient deficiency are prevalent in all the age groups. The recent NFHS-5 data has not shown any significant improvement in the nutritional status of the children. The rates for stunting and wasting has increased or showed no improvement as compared to the NFHS-4.

The Novel Corona virus has also worsen the situation and has impacted the health of the people, efforts should be made to achieve the sustainable development goals (SDG 2) by The United Nations which aims to eliminate hunger and all forms of malnutrition by 2030.

Several programmes and schemes targeting towards iron and Vitamin A deficiency are active in India amongst various age group but the results have not shown any significant Improvement in the overall status which leaves the micronutrient deficiency as one of the grim public health concern for India.

Thus to combat micronutrient deficiency, WHO has recognized fortification as a bridge in filling the micronutrient gaps which is an affordable and viable approach. Food fortification is defined as 'the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health' (WHO). To overcome the micronutrient deficiency which remains as an obstacle in the development of nation, Government of India (GOI) and Food safety and standards authority of India ( FSSAI) has initiated food fortification in five staples, namely rice, wheat flour, oil, milk and salt which are commonly used in an Indian diet, however the knowledge of food fortification is necessary for promoting or creating awareness amongst individuals for the benefits of consuming fortified foods and for identifying the fortified food while purchasing for their grocery needs. Therefore, percent study was undertaken to look at the consumers, perception, awareness and purchase practice regarding fortified foods in urban Vadodara, Gujarat, India.

**METHODOLOGY**

**Study design, and selection of the Participants:** Using a cross sectional study design parents of the students (N=1600). From the Foods and Nutrition department of the Maharaja Sayajirao University of Baroda were screened to elicit the data, of which 375 parents consented to participate in the study. Subjects who were responsible for buying groceries for the family, having active internet and WhatsApp connection were included in the study.

**Data Collection:** The subjects were approached telephonically and were briefed about the study. The study was conducted from September- December 2020. A pre tested Structured questionnaire was administered. Information on sociodemographic characteristics and awareness regarding food fortification was collected using Google forms

**Ethical Approval:** The study was approved by the institutional review board of the Department of Foods and Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda. The ethical approval number of the study is **IECHR/FCS/2020/62**

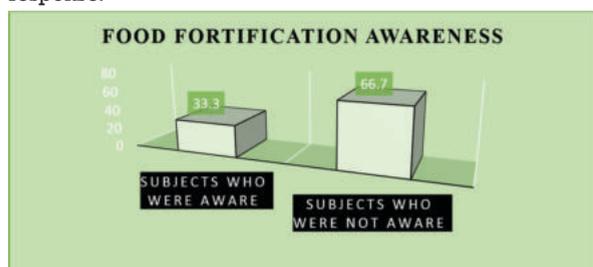
**Statistical Analysis:** The data was analysed using Microsoft

excel for calculation of percentages and the number of subjects in each category.

**RESULTS:**

**1. Sociodemographic Characteristics of subjects:** The gender profile of the study population revealed that 76% of females and 24% were males. Most of the respondents were among the age group of 41-50 years (41.6%). Most of the respondents had honors degree (57.6%) followed by High School (15.2) and Intermediate (11.5). The data on occupation shows that majority of the respondents were either unemployed or belonged to Profession category. Majority of the households belonged to Upper Middle Class (48.3), followed by Lower Middle Class (39.5).

**2. Awareness on Food Fortification:** As seen in Fig.1, subjects who self-reported about the familiarity with the term 'Food Fortification' 33% self-reported that they knew about the term 'Fortified Foods' while majority of the subjects 66.7% didn't hear about fortified foods at all. When subjects were asked about what they knew about fortified foods, from the multiple options provided to them, 28% marked the correct response.



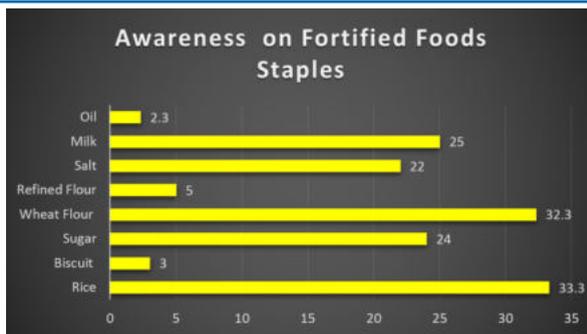
**Fig 1: Percent subjects having awareness about Food Fortification (N=375)**

The results of our study are consistent with the research conducted in Kenya on 1435 subjects it was revealed that nearly 28% of the subjects were aware of food fortification, of which female respondents were more likely to be aware of it. (Linda, et al, 2020). Another study conducted in Urban Delhi amongst 150 women, 56% of women were aware about food fortification and 69% also reported its importance in the daily diet (Kumar Garg, 2020).

**Source of Information:** Majority of the subjects (45.2%) reported broadcast media (Television, Radio, etc., Internet) as the major source of information from where they learnt about fortified foods, followed by print media for 38.7% subjects, while a few of them reported internet ( 8.9%) and outdoor media (bill boards, neighbours) by 7.3% of subjects.

**3. Awareness about Fortification Logo:** Respondents were given three image options and were asked to select the correct logo for fortification used in India. 80% of the respondents who reported about being aware of food fortification, marked the correct responses i.e. 89 respondents out of 112. A study conducted in Urban Delhi among 150 women, showed that 48% of the respondents were aware about the correct fortification logo available on pre packed foods (Kumar and Garg, 2020)

**4. Knowledge on Foods that are being fortified in India:** It was important for the researcher to know whether the subjects who reported about awareness of fortified foods, also knew about the staples that are getting fortified in India. The subjects were given the option to choose multiple responses. Majority of the subjects were aware about wheat flour fortification (33.2%), and rice fortification (33.3%), followed by milk (25%) and salt (22%), while only 3% (approx.) marked oil as the source. Study conducted in Delhi reported that 40% of the respondents knew about the available fortified foods in Indian market. (Kumar and Garg, 2020) **Fig 2**



**Fig 2: Percent subjects having awareness on Staples that are being fortified**

**CONCLUSION:** The present study revealed that 33% of the subjects, had awareness about the term fortified foods, however on asking about its attribute, only 28% could recognize the correct answer. The major source of knowledge was broadcast media which is television and radio, (45.2%). Out of 375 subjects, 89 subjects marked correct response for the fortification logo. However, the knowledge regarding the food sources of fortified foods was lacking amongst the study subjects. Thus, Efforts should be taken to create awareness about fortified foods and its identification while practicing its purchase to make the implementation of FSSAI 2018 regulation more effective.

**REFERENCES:**

- World Meter, UN, Current World Population, Available from <https://www.worldometers.info/world-population/> as on March 15 2021
- Raghupathi, V., and Raghupathi, W. (2020). Healthcare Expenditure and Economic Performance: Insights From the United States Data. *Frontiers in public health*, 8, 156. <https://doi.org/10.3389/fpubh.2020.00156>
- Hannah Ritchie and Max Roser (2017) - "Micronutrient Deficiency". *Published online at OurWorldInData.org*. Retrieved from: <https://ourworldindata.org/micronutrient-deficiency> [Online Resource]
- Gonmei Z, Toteja G S. Micronutrient status of Indian population. *Indian J Med Res* 2018 [cited 2021 Jun 13]; 148:511-21. Available from: <https://www.ijmr.org.in/text.asp?2018/148/5/511/249978>
- Global Alliance for Improved Nutrition (GAIN) India, 2018
- National family health survey (NFHS-4)** 2012–14 [Internet]. Mumbai: International Institute for Population Sciences (IIPS) and Macro International; 2009. Available from: <http://www.rchiips.org/nfhs/nfhs4.shtml> [cited 2014 December 18].
- Linda AA, Kyallo F, Okoth JK, Kahenya P, Makokha A, Sila D, Mwai J. Food Fortification: The Level of Awareness among Kenyan Consumers. *J Nutr Metab*. 2020 Apr 7;2020:8486129. doi: 10.1155/2020/8486129. PMID: 32322418; PMCID: PMC7166277.
- Kumar and Garg, Consumer Knowledge, Attitude and Practice of using Fortified Food in India: A Study among Women in Urban Delhi, *International Journal of Health Sciences and Research*, 2020, July; Volume: 10 | Issue: 7 | Pages: 277-282. Available from: [https://www.ijhsr.org/IJHSR\\_Vol.10\\_Issue.7\\_July2020/IJHSR\\_Abstract.042.html](https://www.ijhsr.org/IJHSR_Vol.10_Issue.7_July2020/IJHSR_Abstract.042.html)