Original Article

Food Fortification: The level of awareness among Pakistani consumers

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Abstract

Background: A lack of essential vitamins and minerals required in small amounts by the human body for proper growth and development is termed as micronutrient deficiency. Such deficiencies are widespread among Pakistani consumers and they include anemia, deficiencies of iron, vitamin A, zinc, vitamin D, etc.

Objectives: The objectives of this study are to assess awareness levels of Pakistani consumers regarding food fortification and to determine factors affecting purchase of fortified food.

Materials and Methods: A descriptive cross-sectional study was carried out among the inhabitants of selected areas of Rawalpindi and Islamabad over a period of one year. Sample size was 398 as calculated by WHO sample size calculator. Non-probability consecutive sampling technique was used. Residents of Rawalpindi and Islamabad aged 18 and above were included while people involved in food industry (owners and employees) were excluded. Data were collected through self-structured questionnaire and analyzed on SPSS version 22. Descriptive statistics were calculated.

Results: 53.3% of our respondents were found to be aware of the term 'food fortification', and 67.5% people believed that the government should make food fortification mandatory.

Conclusion: The majority of the population was aware of the benefits of fortification of milk with vitamin D and preferred fortified milk for their children. The most important factors governing purchase of fortified food were price, availability and nutritive value.

Keywords: Food fortification, awareness, vitamin D, nutritive value.

Introduction

Micronutrients can be defined as vitamins and minerals which must be consumed in small or trace amounts, but are essential for physical and mental development, disease prevention, and wellbeing.[1, 2]
According to the estimates of the World Health Organization (WHO), more than two billion people suffer from these deficiencies globally.[3] According to the National Nutrition Survey in 2011, 43.8% of the people suffer from iron deficiency anemia, 54.0% from vitamin A deficiency and 39.2% from zinc deficiency. Pakistan is one of the many countries where a huge population – 38% of children – is still suffering from stunting.[4] Malnutrition can also be related to almost 35% of all deaths in children under the age of 5 years worldwide.[5]
According to a research conducted in Lahore, 57.7% of the participants were found to be anemic.[6] Risk factors for development of micronutrient deficiencies are low socioeconomic status, poor diet, lack of supplements and lack of awareness regarding dietary recommendation.[7] Iron deficiency leads to severe consequences like low-birth-weight babies and impaired cognitive development in people.[7,8]
WHO and United Nation Organization of Food and Agriculture have identified food fortification as one of the methods for countering these deficiencies by improving diets. Food fortification controls and prevents the deficiency of these essential nutrients.
Micronutrient deficiencies are of an imminent public health concern and have socioeconomic significance worldwide. The most vulnerable populations include women, children, the middle-aged and the elderly.[1] Malnutrition has a number of adverse effects which range from key developmental anomalies like retarded physical and mental development, vision loss or worsening of disease, mental retardation, blindness and general losses in productivity and potential.[2] According to another study conducted at a tertiary care center in Rawalpindi, women visiting for their first antenatal visits had iron levels reduced to 57%; folate at 20%, combined iron folate at 19%, and cobalamin levels at 4%.[8] The authors of 'Food Fortification in a Globalized World' argue that food fortification is a cost-effective strategy for addressing demonstrated nutrient deficiencies in the context of a combination of marginal diets, vulnerable population segments and other drivers of deficiency.
There are not enough data about level of awareness among Pakistani consumers. As micronutrient deficiency is a preventable cause of multiple diseases, this research by assessing the awareness level of Pakistani consumers regarding food fortification, will help us raise awareness regarding micronutrient deficiencies among vulnerable populations, and provide data for strengthening of food fortification programs in Pakistan.
The objectives of this study are to assess awareness levels of Pakistani consumers regarding food fortification and to determine factors affecting purchase of fortified food.

Materials and Methods

This is a descriptive cross-sectional study set in Rawalpindi and Islamabad with the residents of these two cities being its study population.
The study was completed in the duration of one year from January 2021 to January 2022. The total sample size for the study was calculated to be 398. The data were collected through consecutive sampling and the residents of Rawalpindi and Islamabad aged 18 years and older were included in the study. The people involved in the food industry were not considered for data collection based on the predefined exclusion criteria

Results

The total number of participants was 398. Figure 1 depicts the presense or absence of the awareness related to the food fortication terminology. Figure 2 shows the views of our study population regarding the mandatory fortification.
Figure 3 depicts the awareness amongst our study population regarding the benefits of mlk fortification in the urban and rural population.
30% of our study participants told that their preferred source of information about food fortification was the food labels. Only 5% told that their preferred source of information about food fortification was their family members (Figure 4).
Figure 5 shows the response of our study population when asked if they would prefer that their children drink fortified milk.

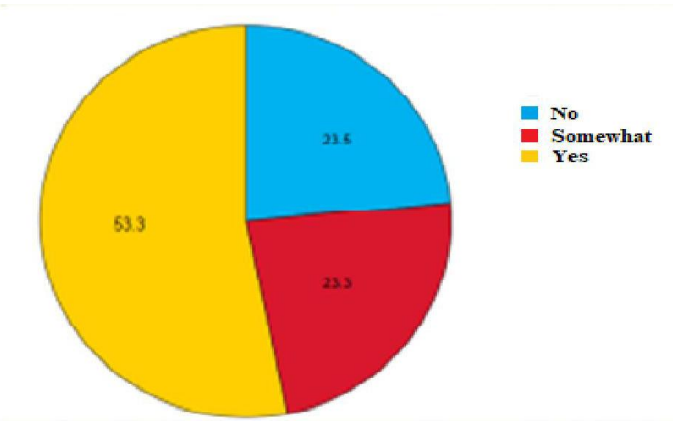

Figure 1: Awareness of the term food fortification (n=398)

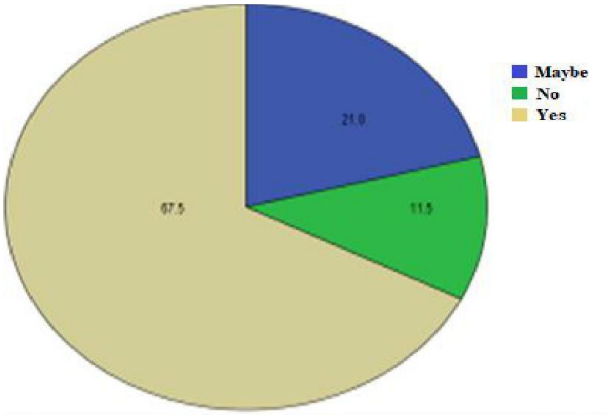

Figure 2: Views regarding mandatory fortification (n=398)

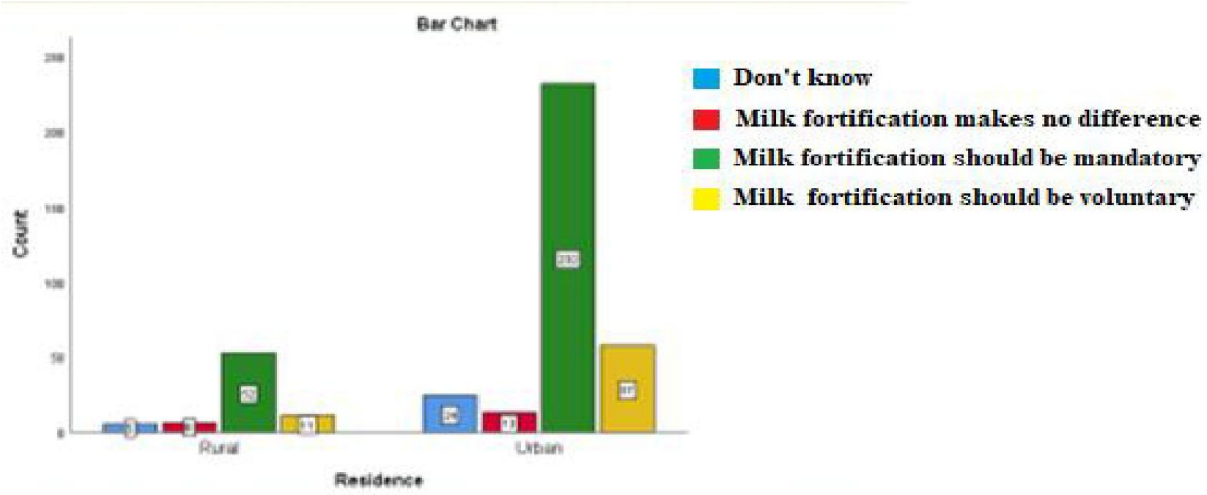

Figure 3: Awareness about benefits of milk fortification (n=398)

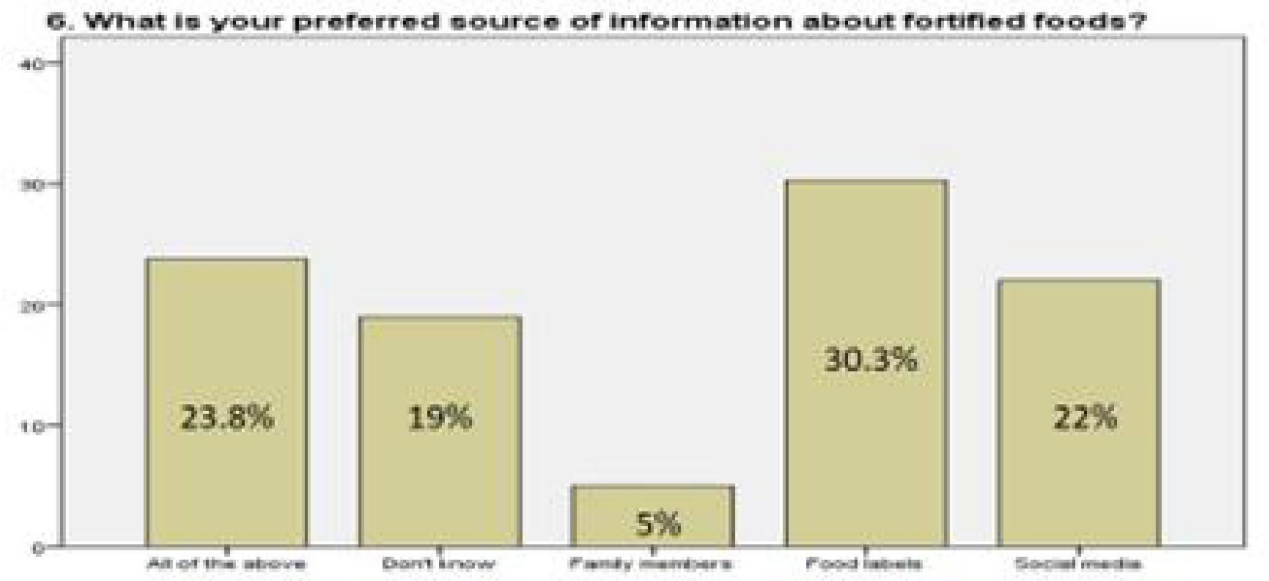

Figure 4: Preferred source of information about fortified food (n=398)

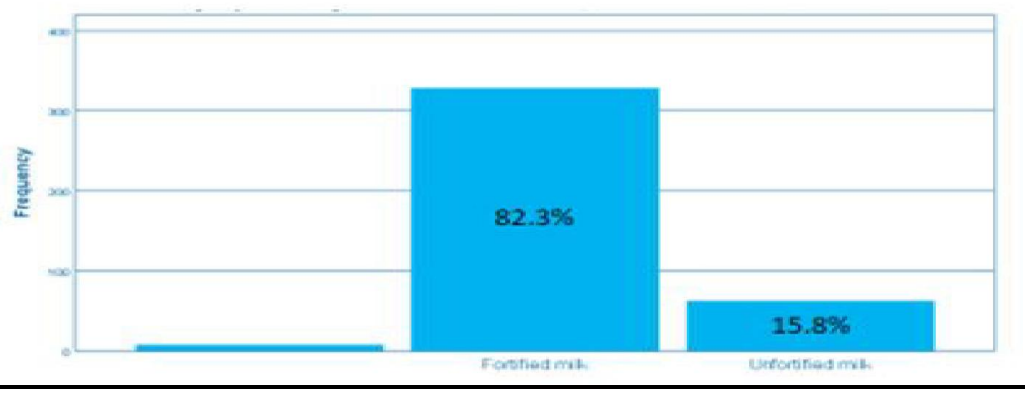

Figure 5: Preference of fortified milk (n=398)

Discussion

In this study, 53.3% of respondents were found to be aware of the term 'food fortification' while 23.5% had never heard of this term before. Relatively, according to a study conducted in Kenya, more than two-thirds of the respondents were not aware of the concept of 'food fortification'. The reason behind the low level of awareness in Kenya might be linked to lack of education, as the people having secondary and tertiary education were revealed to have a better understanding and awareness of this term. The author of the research argued that people should be educated through effective channels including social media platforms, radio, television etc.[9]

In our study, 67.5% of our respondents believed that the government should ensure the addition of vitamins and minerals to food. This contradicts the results of an Australian research where the majority of participants expressed negative views regarding mandatory fortification.[10] In a developed country like Australia, where there is easy access to nutritious food and supplements, mandatory food fortification is considered to be unnecessary in the presence of other strategies to make nutritious food accessible to the population. However, in Pakistan, there is an absence of long-term strategies to improve nutrition.[11]

Mandatory fortification, therefore, is the best food-based approach for solving the nutritional problems in the country. This is supported by a study that demonstrated how the implementation of fortification programs population-wide resulted in a 34% reduction in the occurrence of anemia, 74% reduction in the incidence of goiter.[12] In our cross-sectional study, participants were asked if they knew milk fortification with vitamin D reduces the risk of bone deformities in people. The responses showed that the majority of the population from both rural (93.2%) and urban (92.6%) settings were aware of this phenomenon.

Equipped with this information, the participants were asked if they would consider mandatory fortification of milk with Vitamin D as a means to combat this nutritional deficiency problem. Fortification was considered mandatory by 284 (71%) of the respondents. This is in contrast to a study conducted on different groups of British population that expressed various concerns over mandatory fortification of food despite previously being consumers of fortified food. These concerns were related to consumer choice and toxicity of synthetic vitamin D questioned by the participants and cited as reasons for their hesitation.[13]

A study conducted by Michael F. Holick and Tai C Chen elaborates that vitamin D deficiency leads to rickets and worsens conditions such as osteopenia and osteoporosis and increases risk of fractures.[14] Despite high sunlight exposure which is a natural source of producing Vitamin D for the body, Vitamin D is still vastly deficient in the Pakistani population as supported by a study that showed that 53.5% of the study population had vitamin D deficiency, 31.2% had insufficient vitamin D, and only 15.3% could be considered as having a normal vitamin D level.[15]

High frequency of Vitamin D deficiency and the willingness of participants of this study to utilize fortified sources of Vitamin D make manufacturing fortified milk a very convenient strategy for overcoming the prevalent deficiency in the population. The majority of our respondents (82.3%) preferred fortified milk for their children. This is in contrast to a study conducted in UK in which 59% of the respondents from a total of 188 participants preferred to give fortified milk to their children.[16] The reason for this lower number of users is provided by another

survey conducted in UK that studied 203 parents, out of these, 85.17% of the parents were found to be unaware of recommendation of vitamin D supplementation and its benefits. [17]In our study we found that people are more aware of the importance of fortified food products for their families. This is because our sample comprised mostly of adult population. Another reason is that fortified milk is advertised widely on social media and television in Pakistan, and these advertisements influence public opinion on the consumption of vitamin D enriched milk products.

Majority of the respondents who participated in this study (30.3%) reported food labels as their preferred source of information about fortified foods. This is in contrast to a similar study conducted in Kenya, where vernacular radio was considered as the preferred means for communicating food fortification information.[9] This difference points to the ineffective utilization of broadcast media for public awareness and education campaigns in Pakistan.

According to a Pakistan Demographic and Health Survey in 2017-18, television is the most commonly utilized and accessed form of media by both women (51%) and men (55%).[18] Dissemination of information through television would therefore lead to an increase in awareness regarding food fortification, especially in urban areas. According to a digital report conducted in 2021, the number of social media users in Pakistan stood at 46 million in January 2021.[19] A more targeted approach is therefore required to ensure that campaigns and advertisements reach a wider audience via social media websites. As a developing country, Pakistan struggles with inflation . Thus, it is no wonder that pricing of fortified food tops this list with 15.5%. However, nutritive value seems almost equally important to consumers with 15%.

Lastly, in a country like ours, where food fortification programs have recently been initiated, availability is a considerable factor too. A German study corroborates the notion that perceived personal benefits, like price and nutritive value increased purchase intention of consumers. These factors and their impacts can be accentuated under conditions of high problem awareness.[20]

As of 2021, the literacy rate in Pakistan is 60%[21], while that of European countries on average is 99%[22]. A study carried out in 5 European countries, showed that consumers were aware of their daily vitamin and mineral requirements. One among five Europeans relies on vitamin supplements, while the remaining 80% opt for fortified food.

Conclusion

Most of the consumers are aware of the benefits of food fortification and nutrients added in fortified food. Most of the participants prefer fortified milk products for their families and support mandatory food fortification. Factors affecting their willingness to purchase fortified products include price, availability and nutritive value.

Recommendations:

Awareness campaigns on social media applications as well as electronic media, will help to spread necessary information regarding food fortification. It is also essential to ensure the availability and reasonable pricing of fortified foods in order to increase their consumption. School teachers, health workers and parents must collaborate in order to spread awareness regarding micronutrient deficiencies among general public.

References

1. Tulchinsky TH. Micronutrient deficiency conditions: global health issues. Public health reviews. 2010 Jun 1; 32(1): 243-55.
2. Ritchie H, Roser M. Micronutrient deficiency. Our World in data. 2017 Aug 11.
3. Smith G. Micronutrient fortification of food: issues for Asia. Journal of Nutritional Science and Vitaminology. 2015; 61(Supplement): S183-5.
4. The State of the World's Children report 2019 by UNICEF
5. Imdad A, Bhutta ZA. Global micronutrient deficiencies in childhood and impact on growth and survival: challenges and opportunities. InMeeting Micronutrient Requirements for Health and Development 2012 (Vol. 70, pp. 1-10). Karger Publishers.
6. Ullah A, Sohaib M, Saeed F, Iqbal S. Prevalence of anemia and associated risk factors among pregnant women in Lahore, Pakistan. Women & health. 2019 Jul 3;59(6):660-71.
7. Khan DA, Fatima S, Imran R, Khan FA. Iron, folate and cobalamin deficiency in anaemic pregnant females in tertiary care centre at Rawalpindi. Journal of Ayub Medical College Abbottabad. 2010 Jun 1;22(1):17-21.
8. Ronnenberg AG, Goldman MB, Aitken IW, Xu X. Anemia and deficiencies of folate and vitamin B-6 are common and vary with season in Chinese women of childbearing age. The Journal of nutrition. 2000 Nov 1;130(11):2703-10.
9. Mbuya MN, Neufeld LM. Developing national strategies to prevent and control micronutrient deficiency: the role of food fortification. InFood fortification in a globalized world 2018 Jan 1 (pp. 29-40). Academic Press.
10. Linda AA, Kyallo F, Okoth JK, Kahenya P, Makokha A, Sila D, Mwai J. Food fortification: The level of awareness among kenyan consumers. Journal of nutrition and metabolism. 2020 Apr 7;2020.

11. Rowland E, Dugbaza J, House B. Consumer Awareness, Attitudes and Behaviours to Fortified Foods. FSANZ, Canberra, Australia. 2010.
12. Wieser S, Brunner B, Tzogiou C, Plessow R, Zimmermann MB, Farebrother J, Soofi S, Bhatti Z, Ahmed I, Bhutta ZA. Reducing micronutrient deficiencies in Pakistani children: are subsidies on fortified complementary foods cost-effective?. Public health nutrition. 2018 Oct;21(15):2893-906.
13. Kraemer K, Van Zutphen KG. Translational and implementation research to bridge evidence and implementation. Annals of Nutrition and Metabolism. 2019;75(2):144-8.
14. Holick MF, Chen TC. Vitamin D deficiency: a worldwide problem with health consequences. The American journal of clinical nutrition. 2008 Apr 1;87(4):1080S-6S.
15. Riaz H, Godman B, Bashir S, Hussain S, Mahmood S, Waseem D, Malik F, Raza SA. Evaluation of drug use indicators for non-communicable diseases in Pakistan. interactions. 2016;18:19.
16. Day RE, Krishnarao R, Sahota P, Christian MS. We still don't know that our children need vitamin D daily: a study of parents' understanding of vitamin D requirements in children aged 0-2 years. BMC public health. 2019 Dec;19(1):1-4.
17. Drury R, Rehm A, Johal S, Nadler R. Vitamin D supplementation: we must not fail our children!. Medicine. 2015 May;94(18).
18. Mahmood A, Sultan M. National Institute of Population Studies (NIPS)(Pakistan), and Macro International Inc. Pakistan Demographic and Health Survey. 2006; 7: 123-45.
19. Kemp S.(2021 February 11). Digital 2021: Pakistan. Data Reportal.
20. Jahn S, Tsalis G, Lähteenmäki L. How attitude towards food fortification can lead to purchase intention. Appetite. 2019 Feb 1; 133: 370-7.
21. Statista. 2021. Pakistan - Literacy rate | Statista. [online] Available at: https://www.statista.com/statistics/572781/literacy-rate-in-pakistan/
22. Literacy - The World Factbook - CIA. United States CIA. 2010 – via Encyclopedia of the Nations.