Summary and Conclusion

CHAPTER 6

SUMMARY AND CONCLUSION

Food Fortification is one of the strategies which is convenient and viable due to its cost effectiveness and mass spread without any change required in the diet-related practices. There are number of studies found where the importance of Food Fortification to improve the micronutrient status, reducing the anemia prevalence, and improve the cognitive development. The various efforts have been made to overcome the micronutrient deficiency through introducing the Fortified Foods. The integration of the Fortified staples incorporated into the health policies and National Health Programs to focus on the improvement of the continuum care.

However, there was limited literature available for the advocacy conducted for the Fortified Foods, especially in India, and the consumers' attitude and uptake for it. With this as a rationale statement, the present study was carried out with the aim to increase the awareness of Fortified Foods in Vadodara district of Gujarat. The study followed Diffusion of Innovation as one of the models for categorizing the adopters in different categories based on their rate of adoption of Fortified Foods.

The objectives of the present study were:

1. To enroll subjects from the Faculty of Family and Community Sciences (College) until the desired sample size is reached
2. To develop tools for collecting the information on the Socio-economic profile of the Enrolled Subjects and to assess their awareness various Fortificants (Micronutrients)
3. To develop Graphics, Videos for the intervention phase
4. To collect baseline information on awareness, attitude and purchasing practices of Fortified Foods
5. To sensitize the enrolled subjects on Fortified Food and its components
6. To evaluate the impact of e-intervention sessions given to the enrolled subjects at intervals

7. To identify the available brands for Fortified products (focusing on 5 staples, namely DFS, Milk, Wheat Flour, Rice, and Oil) in the hypermarkets and Traditional Kirana stores (Grocery Stores) from the four Zones of Vadodara

Results of Phase I: -Baseline

- The gender profile of the study population revealed that 76% were females and 24% were males. Most of the respondents were among the age group of 41-50 years (47.7%), having an 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 the Profession category. The majority of the households belonged to Upper Middle Class (48.3) at baseline, 33% of the subjects reported that they have heard the term' Fortified Foods'
- Thirty-Three percent of the respondents were from a nutrition background, while the rest 66% of the subjects were from a non-nutrition background
- At the baseline 20% of the subjects could identify the correct +F logo for the identification of Fortification in staple packed foods in India.
- Only 28% of subjects would identify the correct definition of Fortified Foods
- Awareness regarding Fortified staples was limited amongst the study subjects. Wheat flour Fortification for 33.2%, rice Fortification for 33.3%, followed by milk at 25%, and double Fortified salt (22%). Only a few of the subjects were aware of oil Fortification (2.3%)
- Only 2% of the subjects believed Fortification should be for everyone, irrespective of age and gender
- The Unintentional purchase practice for one or a few of the staples were being followed by 60% of the subjects
- The major source of information was the Broadcast media – Television, Radio, internet, etc for 45% of the subjects
- The attitude regarding safe consumption of Fortified Food was uniform (50%) for correct and incorrect responses. Subjects were asked whether they were willing to pay more for Fortified Foods. Most subjects (66.9%) said 'yes,' while the rest 33.1 % were not willing to pay more for Fortified Foods
- The purchase of Fortified rice and oil was being practiced by 6% and 15% of the subjects respectively as reported, followed by wheat flour (13.6%) and salt (7.7%).

- Subjects' awareness regarding Vitamin A was correct for the health benefits (65%) and signs of deficiency (77.3), however, the awareness of food sources for vitamin A was limited.
- Awareness of Vitamin D health benefits, sources, and signs of deficiency were identified correctly by, 67%, 60%, and 72% of subjects respectively
- Awareness of Vitamin B12 health benefits was identified correctly by the majority of the subjects (73.6%), sources by 50%, and signs of the deficiency by 57.6% of the subjects
- Awareness regarding the health benefits of food sources and signs of deficiency of Iron was identified correctly by the majority of the subjects (77.9%), sources and signs of the deficiency by 78% and 61% of the subjects, respectively.
- Awareness of Iodine health benefits was identified correctly by only a few of the subjects (5.3%), whereas awareness regarding sources was known to (43.2%) and signs of deficiency to (57.6%) of the subjects.
- Subjects having the highest degree of education had better awareness of the micronutrients. However, the degree of association was weak as per Cramers' V test. However, no such association was observed between the degree of education and awareness scores of vitamin A and Iron.
- A significant association between awareness regarding the health benefits of Vitamin A and the occupational levels of the subjects was observed ($P<0.05$). Subjects having highest hierarchy in the occupational level had better awareness of the health benefits of Vitamin A.

Phase II Interventional Phase:

- Food Fortification awareness for definition, logo, and the target group increased by 17-24%
- The awareness regarding Fortified Foods, post e-intervention improved from 18% to 66%. A maximum increase in awareness was observed for oil (66%) followed by salt (35%) and milk (33%).
- Highly significant improvement was observed in the various attitude parameters, post e-intervention ($P<0.05$)
- A statistically significant difference in the proportion of purchase practices of Fortified rice, wheat flour, salt, milk, and oil, was observed post e- intervention with $P<0.001$

- All the respondents (100%) who undertook google form post 7 months of washout period, marked the correct logo for Fortified Foods as their response
- Washout Form was undertaken by 244 subjects, of which 80% (n=195) were still consuming Fortified Foods after 7 months of washout, while 17% (n= 42) were purchasing sometimes and 3% (n=7) marked 'No' as their response.
- The majority of the subjects (70%) were purchasing oil, followed by 53% for Double Fortified Salt, Milk (40%), Wheat Flour (20%), and Rice (13%).
- The results revealed that 12.4% of the subjects were categorized as Innovators, 24.3% as early adopters, 26.2% as the early majority, 8.2% as the late majority, and 24.7% as laggards when assessed using the Diffusion of Innovation Theory.

Phase III Market survey for Fortified Foods Availability

- Fortified Foods in the hypermarkets of Vadodara. The hypermarkets in Vadodara that were selected were Big Bazaar, Spencer's, D-Mart, Bansal mall, Spencer's, and Patanjali. It was observed that nearly 7 to 10 Fortified oil was available in the hypermarkets of Vadodara. The availability of Fortified milk was available in Spencer's and Big Bazaar. There was no availability of Fortified wheat flour. Availability of one brand for Fortified rice and Double Fortified salt each in the hypermarket.

To Conclude, the study is one of its kind to the best of our knowledge to Create the advocacy for Food Fortification using e- intervention, capture the public preferences for Fortified Foods in the market, and conduct a market survey, while also focusing on the knowledge of micronutrients, being used as Fortificants like Vitamin A, vitamin D, Vitamin B12, Iron, and Iodine. In addition, the study used the Diffusion of Innovation Model to categorize its subject since the use of WhatsApp during the Covid pandemic was selected as a medium for e- intervention methodology. There is enough evidence on the use of social media as a medium for sharing the public health-related awareness messages and has proven to be effective.

The study has captured the limited availability of the Fortified Food products in an open market and the concern for the shift in the prize, other findings that the study reported which could be the reason for the limited uptake in the practice is the traditional practice of making wheat flour at home in Gujarat, where the study was conducted and the preferences towards the particular brand.

The hesitation of the subjects to shift their brands from one they prefer to the other is, however, difficult to influence in a short period for the benefit of their Health.

The market survey findings recorded multiple brands for the Oil, however, milk, wheat flour, rice, and slat availability was much less than the availability of Oil. Thus to create awareness and create demand, it is important to conduct training sessions with the producers for the supply of Fortified Food in an open market with a rise in prizes only according to the acceptable limits.

Besides, the impact of the intervention, the study has also used the Diffusion of Innovation theory to track the adopter's categories. According to Rogers's model, the four components that can persuade a person to the adoption of innovation are relative advantages, compatibility, complexity, and trialability, which were considered while sharing the messages on WhatsApp during an intervention. Messages regarding the advantages of food fortification, safe use while cooking and consumption, and the availability of fortified foods in the markets for promoting trialability were ensured. The DIM model has been applied in agricultural, public health, social marketing, and educational-based interventions (Dearing et al., 2009).

The success of DIM can vary with the type of technology and innovation that is being promoted to the target audience. However, the graph observed in the present study was similar to the bell-shaped graph that was proposed by Roger in his model.

Thus, with all the results and the discussions kept in mind for the present study, we accept the alternative Hypothesis and reject the Null Hypothesis: -

Alternative Hypothesis: -

One Month e- Intervention sessions **will have a positive impact** on

1. subject's Purchasing Practices for Fortified Foods
2. and on their ability to identify the ***+F*** logo found on Fortified staples