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Attitude, Awareness and Recommendations Regarding Fortified Food Usage Amongst Health Care Professionals Punjab

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ABSTRACT

Introduction: Fortification is the practice of deliberately increasing the content of one or more micronutrients i.e., vitamins and minerals in a food or condiment to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health. As well as increasing the nutritional content of staple foods, the addition of micronutrients can help to restore the micronutrient content lost during processing**.**

Objectives: To assess attitude about fortified foods, awareness regarding usage of fortified food and related recommendations amongst health care professionals of Punjab.

Place and duration of study: All districts of Punjab (Total of 36 districts). The study was carried out from 1st September 2020 to 1st March 2021.

Materials and methods: A descriptive cross-sectional study in which total 360 MBBS doctors, nurses, mid wives, lady health care workers from 36 districts of Punjab were taken as sample through systematic random sampling. A close ended questionnaire was constructed. Three questions were asked related to awareness of fortified food consumption amongst health professionals, one question highlighting preferred micronutrient for fortification from all the four groups was included moreover, one question related to selection of food item for fortification was also asked. Data was entered in SPSS version 26.0. Frequency and percentage were calculated for categorical variable related to awareness, attitudes and recommendations. P-value less than 0.05 was considered as a significant.

Results:21.4 % of LHWs are of the opinion that regular consumption of fortified foods by reproductive age group women and school going children is safe, followed by doctors (9.7%), nurses (10.6%) While only 4.2 % of the midwife's supported consumption of fortified foods. Fortified food was preferred over consumption of supplements by most of the LHWs (20%) whereas only 4.4% doctors, 1.4% nurses and 0.6% midwifes preferred fortified food consumptions. Most of the doctors, nurses, LHWs were practicing prescribing of calcium followed by iodine, vitamin D and iron as fortificants. 37.7 % of the doctors preferred oil and fruit juices as items for fortification. Oils/Ghee was the most preferred food item for fortification by doctors (54%) and LHWs (56%). Whereas nurses (40%) go for milk and its products. As per the midwives are concerned, they particularly preferred breakfast cereals as food item for fortification.

Conclusion: Most of the health professionals were only aware about fortification of calcium, iodine, vitamin D and iron and their most preferred vehicle for fortification were oil/ghee, juices, bread and water.

Keywords: Attitude, Awareness, Fortified food, Fortificants, Fortification vehicles, Health Care Professionals.

INTRODUCTION

Inadequate nutrient intake results in various health and nutritional deficiencies. Proper nutrients intake is important to maintain healthy life at every stage of development. Poor mental functioning, growth disorders, high rate of infections may arise in infants due to improper nutritional supply during pregnancy[1].

Intake of poor imbalanced diet, monotonous food consumption, malabsorption, drug addiction are a few various factors that leads to poor nutritional status[2]. Fortification is one of the best tools to curb the mentioned issues. Developing countries are fortifying the staple food items whereas the developed countries had fortified.

Various non-perishables, semi-perishable and perishable food items[3].A cross sectional survey was conducted in Kenya, where level of awareness about the fortification process was analyzed. Out of 100% only 28% individuals were aware of it through radio. Individuals were not aware of the particular role of vitamins and minerals but they answered that the lack of micronutrients causes various health ailments[4]. During fortification micronutrients are used in compound form for effective and quick absorption[5].Vitamin-A fortified margarine was first

launched in Denmark.Similarly, vitamin D fortified milk and iodine fortified salts in United States, folic acid fortified cereals and grains in Canada results in reduction of multiple neurological, bones and blood related disorders. Prevalence of pellagra was reduced due to niacin fortified bread consumption in United States[6].The regular intake of food item by community members is the most important factor that should not be neglected[7].Anti-nutritional factors in the food stuff are also considered essential[8].These maybe stabilizers and absorption enhancers which are proven to be beneficial components[9].

Individualized targeted human milk fortification of human milk in developed countries showed positive growth among infants[10].A huge project related to voluntary fortification was executed in Ireland[11]. Bio-fortification now is very common in developed countries and a few developing ones[12]. Orange-fleshed sweet potatoes are being fortified with vitamin A in South Africa[13].Health promotion programs along with strong political support leads to better outcomes in terms consumption of fortified foods[14].Paid media campaigns are effective to increase fortified food awareness but its sustainability in context to geographic area and cost is a hindering factor[15]. School setting to promote education related to fortificants usage can be a good option[16].

The reason behind conducting this study is the increased ratio of macro and micronutrient deficiencies in Pakistan. This problem needs to be eliminated through proper running of fortification programs. The conducted research will help in identifying attitude, awareness and recommendations of health care professionals which will be in a good stead in smooth working of mandatory fortification programs.

The objective of this study was to assess attitude about fortified foods, awareness regarding usage of fortified food and related recommendations amongst health care professionals of Punjab. The significance of the present study was to establish a baseline for future interventional projects that can reduce global burden of disease.

MATERIAL AND METHODS

The study design was cross-sectional (descriptive). Ethical approval was taken from Ethical Review Board of Social and Cultural Studies Department, University of the Punjab.

As per study setting all 36 districts of Punjab were considered. The study was carried out from 1st September 2020 to 1st March 2021. Health care professionals (MBBS doctors, nurses, midwives and lady health care workers) were the study population. Health care professionals of 36 district of Punjab and those who have any course, certification or diploma related to nutrition were excluded. Sample size was found to be 352 which was approximated to 360 by using formula $N=Z^2P\ (1-P) \div d^2$ where Z=1.96, d=0.05 where P=0.42. Moreover, systematic random sampling was carried out. According to Punjab Health Statistics 2020 there was 317 government hospitals in Punjab divisions in which 87121 male and female medical practitioners, 81816 nurses, 14704 LHCWS and 15981 midwifes were working. Sample was approached through telephonic conversation. The list of the doctors, nurses, midwives and lady health care department was taken from primary & secondary and tertiary health care department. Awareness (health care professional's knowledge and concept about food fortification and fortified food), attitude of health care professional (positive and negative attitude regarding prescribing fortified foods) and recommendations (what food items should be used as a fortificant in one's diet) about fortified foods were the dependent variables of the study. While health professionals age, gender and occupation were the independent variables. A questionnaire was used to collect data that was developed in English. The questions were asked by the researchers by translating to Urdu where it was required. That consist of questions regarding demographic data, attitude and awareness regarding fortified food and supplements. Moreover, awareness related currently used micronutrients, recommended fortificants and food items during fortification was also assessed. Face to face interaction with written consent to fill questionnaire from all health care professionals was done. Data was analyzed by using SPSS version 26. P. Data was presented through frequency distribution tables, charts and graphs.

Statistical analysis: Cronbach Alpha was applied to check reliability of questionnaire, and it was found to be more than 0.8. Pilot study was done but pilot sample was not included in the study. For demonstration of attitude related to fortified food, preferred fortificants along with their vehicle and recommended vehicles for fortification, bar chats were used. Frequency and percentage were calculated for categorical variable related to awareness of fortified foods. Attitude, awareness and recommendations were statistically analyzed. P-value less than 0.05 was considered significant.

RESULTS

Only lady health care workers (21.4%), considered the consumption of fortified foods to be safe by childbearing women and school going children. Whereas 10.6% of nurses, 9.7 % of doctors and 0.3% of midwives were of the opinion of regular consumption of fortified foods. (Table -1)

Opinion regarding consumption of fortified food by women of childbearing age group and school going children is safe.		
Doctors	9.7% Agree 5.3% Neutral 5.0 % Disagree 4.7%Strongly Disagree	P-Value <0.001
Nurses	10.6% Agree 1.4% Neutral 12.8% Disagree 0.3%Strongly Disagree	
Midwives	4.2% Agree 8.1 % Neutral 12.8% Disagree	
LHWs	21.4% Agree 0.3% Neutral 0.3% Disagree 3.1%Strongly disagree	

Table-1: Awareness regarding Fortification and Fortified foods.

Consumption of fortified food over supplements is beneficial		
Doctors	4.4% Agree 6.7% Neutral 6.4 % Disagree 6.7%Strongly Disagree	P-Value <0.001
Nurses	1.4% Agree 1.1% Neutral 22.5% Disagree	
Midwives	0.6% Agree 7.5 % Neutral 13.1% Disagree 3.9%Strongly Disagree	
LHWs	20% Agree 2.5% Neutral 0.8% Disagree	

Table-2: Attitude related to fortified food and supplementation.

Fortified food was preferred over consumption of supplements by most of the LHWs (20%) whereas only 4.4% doctors, 1.4% nurses and 0.6% midwifes preferred fortified food consumptions.

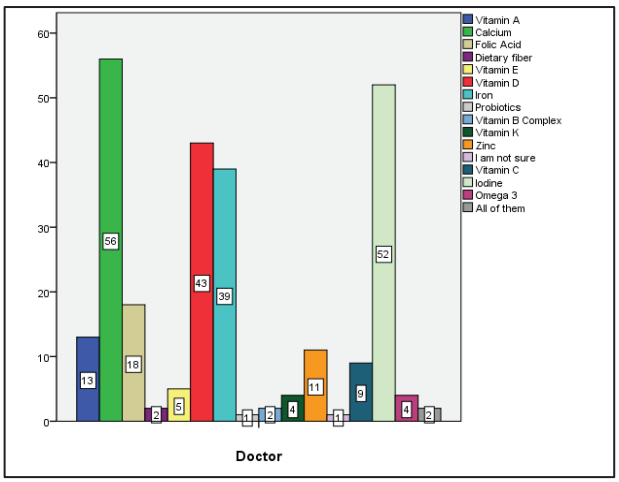

Fig-1: Awarenss related to micronutrients usage amongst doctors.

Majority of doctors were aware of calcium , iodine , vitamin D and iron fortifcation. (Fig-1)

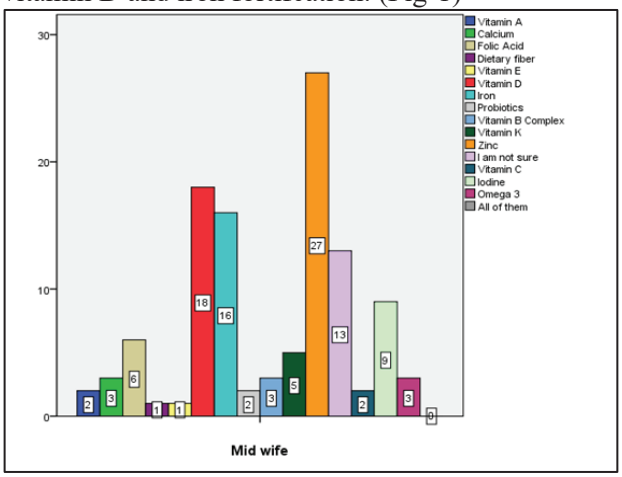

Fig-2: Awarenss related to micronutrients usage amongst midwives.

Majority of doctors were aware of zinc, vitamin D, iron and iodine fortification (Fig-2)

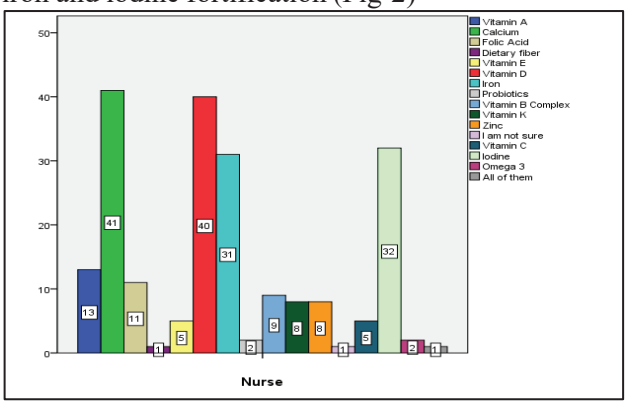

Fig-3: Awarenss related to micronutrients usage amongst Nurses

Nurses were aware of calcium, vitamin D, iron and vitamin A fortification (Fig-3).

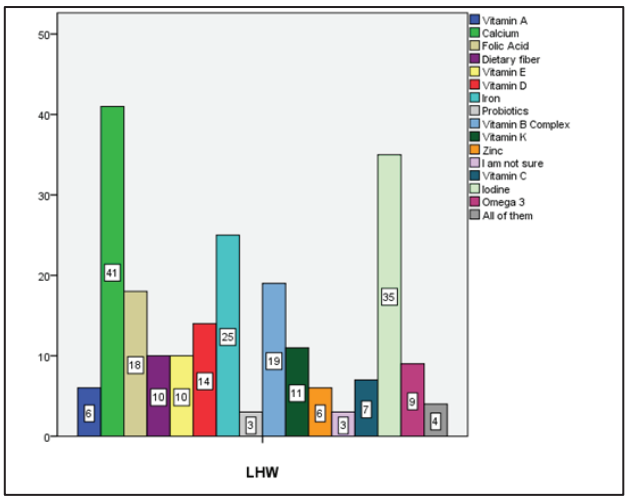

Fig-4: Awareness related to micronutrients usage amongst LHV.

LHWs were aware of calcium, iron vitamin B complex and folic acid fortification. (Fig-4)

From Fig-1, Fig-2, Fig-3, Fig-4 it was found that most of Doctors,Nurses and LHWs were aware regarding the practice of calcium followed by iodine, vitamin-D and iron as fortificants. Furthermore, omega 3 , dietary fibers ,zinc, vitamin K, Cand B complex was least known.Most of the midwives were aware of the usage of zinc as fortificants.

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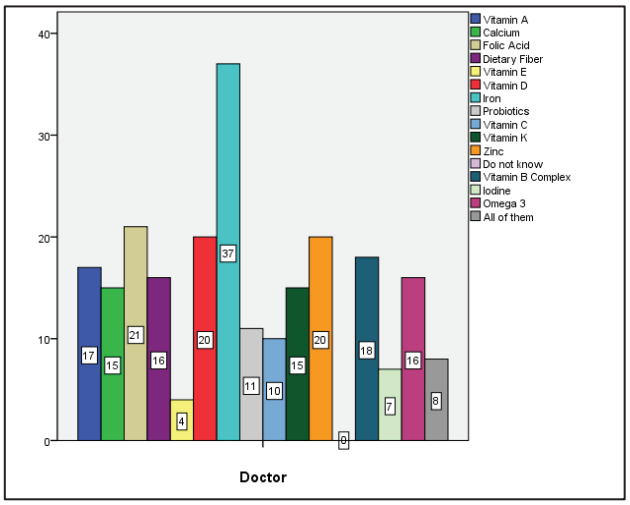

Fig-5: Preferred Fortificants amongst doctors.

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Doctors prefered iron followed by vitamin-D, folic acid and zinc to be utilized as fortificants during fortification process(Fig-5).

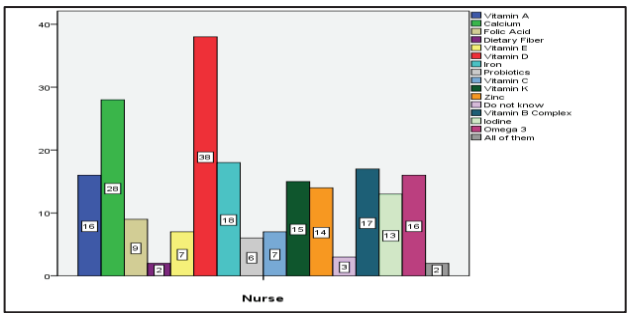

Fig-6: Preferred Fortificants amongst nurses.

Nurses prefered vitamin-D followed by calcium , iron and vitamin K to be utilized as fortificants during fortification process (Fig-6)

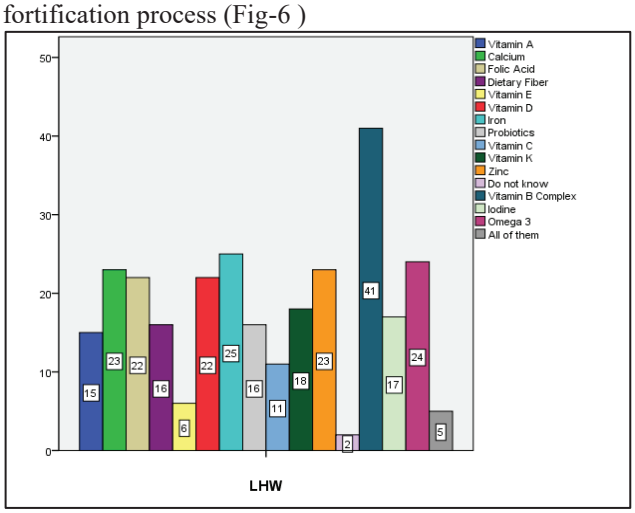

Fig-7: Preferred Fortificants amongst LHWs

LHWs prefered vitamin K followed by iron, omega 3 ,zinc and calcium to be utilized as fortificants during fortification process(Fig-7).

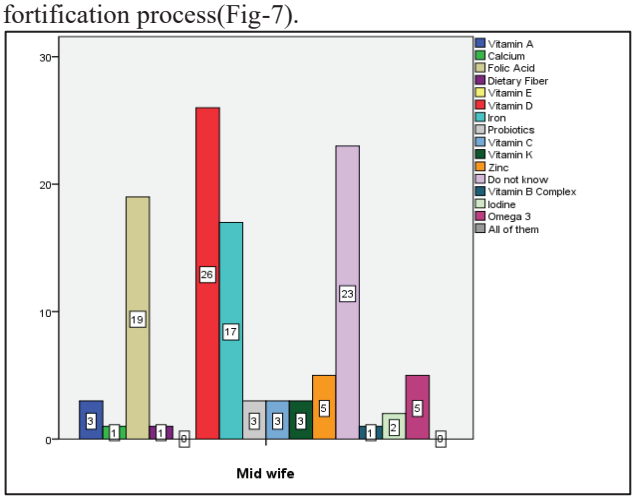

Fig-8: Preferred Fortificants amongst midwives

Midwives preferred the use of vitamin D followed by probiotics and iron to be used fortificants (Fig-8.)

From Fig-5, Fig-6, Fig-7 and Fig-8 it was found that doctors (42%) suggested iron followed by folic acid as micronutrients for fortification. Most nurses (42%) and midwives (26%) suggested vitamin D as fortificant. Whereas 46% of LHWs preferred Vitamin K.

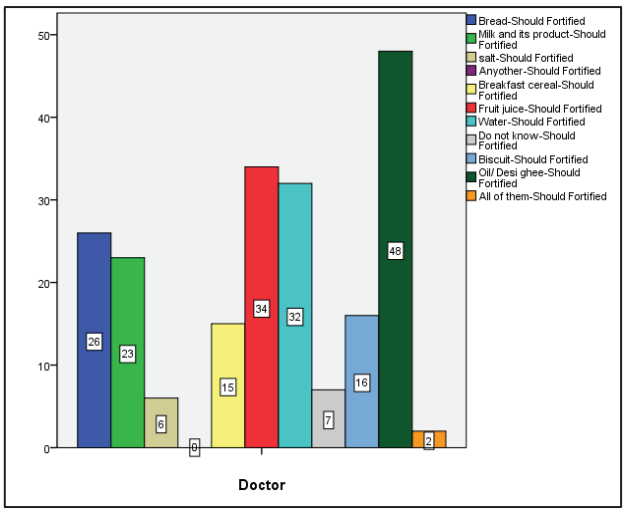

Fig-9: It is concluded that doctors suggested the use of oil/desi ghee followed by fruit juice and water to be used as vehicle for fortification.

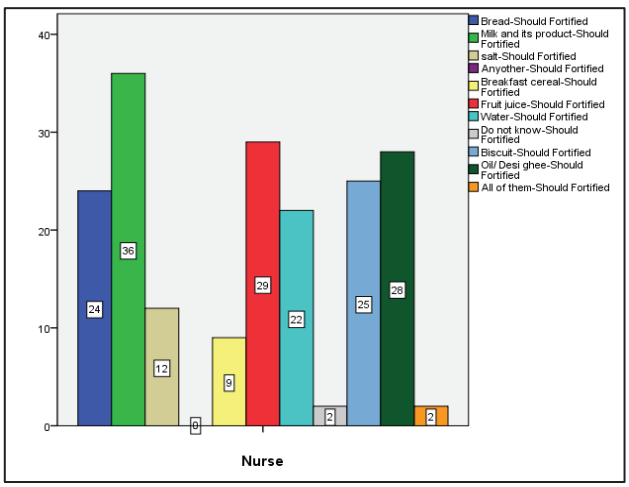

Fig-10: Nurses suggested the use of milk followed by water by oil/desi ghee, fruit juice as vehicle.

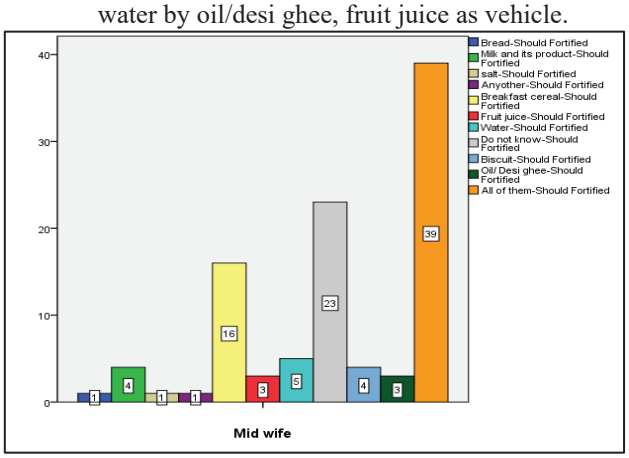

Fig-11: Most of the midwives were of opinion that all the suggested vehicles should be used as vehicle. A few suggested breakfast cereals should be used as vehicle.

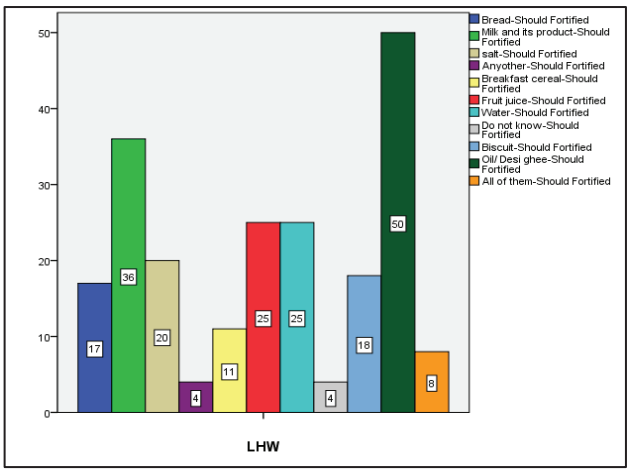

Fig-12: Suggested that oil /desi ghee followed by milk, fruit juice and water should be used as vehicle for fortification.

Fig-9, Fig-10, Fig-11, Fig-12 show desired food item for fortification recommended by health care professionals. And from these figures it can be clearly seen that Oils/Ghee was the most preferred food item for fortification by doctors (54%) and LHWs (56%). Whereas nurses (40%) go for milk and its products. As per the midwives are concerned, they particularly preferred breakfast cereals as food item for fortification.

DISCUSSION

Health promotion programs play a vital role in lessening down global disease burden. The hypothesis of this study was that the health care professionals would be well aware of fortified foods and have positive attitude regarding prescribing them. But the result of this study proved that the health care professionals were not well aware of fortified food usage and were preferring supplementation. Pakistan is developing by leaps and bounds in health domain. To initiate mandatory fortification program in Pakistan all the loop holes must be catered at the right time. This conducted research will help to highlight the type of fortification and vehicle to be selected. Moreover, this research also focuses on the proper training of health care professionals so that they might motivate general public. The reason behind selecting health care professionals is that they are considered as most trusted worthy professionals, and they have maximum interaction with public. Milk fortification with calcium and iodine was mostly known by health professionals. Among the targeted groups nurses (23.8% of total) and doctors (18.3% of total) preferred consumption of supplements over fortified food to prevent nutrient deficiencies. One of the studies conducted in South East Asia showed that

females were consuming more oil and ghee that were fortified with vitamin D. It was also seen that they were more knowledgeable about reading food labels and selecting fortified foods while going to purchase grocery. They preferred purchasing fortified flour, salt, spaghettis and fruit juice[17]. One of the study conducted in Germany revealed that excess consumption off dietary supplements leads to toxicity in body while it is safe to consume fortified products but in our study it was concluded that health care professionals preferred consumption of supplements over fortified foods[18].

A similar study was conducted in which mothers and children were given vitamin A, fortified foods. A systematic review identified 201 studies in which fortified food effects among children and mothers were seen. It was found that their hematologic markers were improved due to significant usage of vitamin. Proper guidance should be provided to consumers so that willingness to consume fortified products as part of their regular meals can be done[19].

A study that was conducted on British population in which their recommendations about food item to be fortified was enquired, the studies showed that flour followed by rice and water was selected as vehicle but our conducted research showed that the most preferable food item was oil / ghee, milk and its product and breakfast cereals[20].

As per the recent survey conducted by UNICEF in 40 % of under five-year Pakistani children are zinc and vitamin D deficient and 62 percent are anemic. National Nutrition Survey 2018 depicts that around 43% of Pakistani adolescent girls are anemic similarly 79 % women of reproductive age are vitamin D deficient. Our research showed that 26% midwives suggested vitamin D as fortificants. It is important to mention here that midwives are in regular contact with general population[21]. In pakistan zinc fortified fertilizers are used to grow staple crops that reduces the prevalence of diarhea[22]. Study in United States showed that US had already begun mandatory fortification of folic acid to control the incidence rates of neural tube defects among new born, whereas in our study it was found that only 42% of the doctors suggested folic acid as micronutrient for fortification[23]. In Chinese National Nutrition Survey, it was revealed that consumption of fortified foods was safe to consume by pregnant ladies. Our research concludes that only 4.2 % midwives agreed that consumption of fortified foods during pregnancy is safe[24].

Health care professionals from all over the Punjab were unable to be part of this study due to time and resources constraints. It is recommended to opt mandatory fortification approaches to be launched legally and strict check and balance regarding their implementation. District management price control department should lessen down cost of available fortified products. Evaluation of fortification programs through sensitizing health care professionals and experts play a vital role in successful implementation of programs. As in the conducted study we sensitized our health care professionals regarding fortification[25].

CONCLUSION

Food fortification is one of the best tools to prevent nutrient related diseases. A balance diet alone can't lessen down dietary deficiencies. Most of the health professionals were aware about fortification of calcium, iodine, Vitamin D and iron and their most preferred vehicle for fortification were oil/ghee, juices, bread and water.

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