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3 **Knowledge and Awareness on Food Fortification among**  
4 **Mothers/Child caretakers of Kinondoni Municipality,**  
5 **Tanzania**

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16  
17 **ABSTRACT**

18 **Objective:** The objective of the study was to evaluate the success of social mobilization and capacity  
19 building efforts to educate the mothers/child caretakers and the general public regarding food  
20 fortification and the importance of consuming fortified food products in Kinondoni municipality.

21 **Methodology:** The study involved mothers/child caretakers with children aged 6-59 months who  
22 were present during the period of the interview at Sinza hospital (n = 26), Magomeni hospital (n =  
23 39), Manzese dispensary (n = 81) and Tandale health centre (n = 54). The knowledge and awareness  
24 information regarding food fortification were collected through face to face interview with the consent

25 of interviewee using structured questionnaires. The data were analysed by using the descriptive  
26 statistics.

27 **Results:** The study findings showed 64% of the mothers/child caretakers have heard the term  
28 micronutrients from various sources and only 7.9 % of mothers/child caretakers were able to define  
29 the term micronutrients, as vitamins and minerals. Meanwhile, 29% mothers/child caretakers have  
30 heard the term food fortification and 79% don't know types of foods being fortified with  
31 micronutrients. The main source of information regarding food fortification mentioned by  
32 mothers/child caretakers was health workers (41.7 %) and the most underutilised source of  
33 information was posters (0.1%). The study further noted more than 50% of the mothers/child  
34 caretakers were not aware of the health benefits of the micronutrients (vitamin A, folic acid, iodine  
35 and iron) being added in food. The findings further revealed that knowledge and awareness on food  
36 fortification have no influence with income, level of education and age of the mothers/child  
37 caretakers.

38 **Conclusion:** Generally, the knowledge and awareness regarding food fortification are very low  
39 among mothers/child caretakers in Kinondoni municipality prompting a need to conduct intensive  
40 social mobilization towards promoting awareness among the mothers/child caretakers as well as the  
41 general public to improve child nutrition.

42  
43 **Keywords:** *Knowledge, Awareness, food fortification, mothers/child caretakers, vitamins, minerals*

## 44 **1.0 INTRODUCTION**

45 Micronutrient deficiencies continue to be a problem of considerable magnitude in most of the  
46 developing countries including Tanzania [3, 4]. Severe clinical forms due to micronutrient  
47 deficiencies include night blindness, cretinism, low birth weight, impaired mental capacity, increased  
48 morbidity and mortality associated with certain infections, physical deformity like neural tube defects,  
49 cognitive delays, severe anaemia, poor concentration, poor productivity capacity and increased  
50 severity of diseases associated with HIV/AIDS due to weakened immune system [5, 7, 11].

51 In Tanzania, the prevalence of micronutrient deficiencies is quite high, for example according to  
52 Tanzania Demographic and Health Survey (TDHS) [1, 2] more than half (58%) of children are  
53 anaemic with 35% of children being iron deficient. Also 45% of women of child bearing age are  
54 anaemic with 30% being iron deficient. In addition TDHS found that 37% of women aged 15-49 years  
55 and 33% of children aged 6 -59 months are vitamin A deficient[1]. Furthermore, an estimated 27,000  
56 infant and 16,000 maternal deaths that occur each year can be attributed to micronutrient  
57 deficiencies[14]. In addition to the disease burden, micronutrient deficiencies severely affect  
58 economic and human development in Tanzania [8, 14]. For instance, it has been estimated that  
59 micronutrient deficiencies ( iron, vitamin A and folic acid alone) lead to an annual loss of US\$ 518  
60 million each year or about 2.65% of Tanzania's gross domestic product (GDP) [14] and childhood  
61 anaemia alone is associated with a 2.5% reduction in adult wages [13].

62 The strategies to address micronutrient deficiencies in developing countries including Tanzania have  
63 included micronutrients supplementation, food and nutritional education, food fortification,  
64 biofortification of staple foods, dietary modification or diversification and reduction of disease burden  
65 which exacerbate the micronutrient deficiencies like measles, diarrhea, acute respiratory infections  
66 [11, 12]. However, on long term perspective, food fortification intervention seems to be extremely  
67 effectively in addressing the problem of micronutrient deficiencies because it is generally recognized  
68 as being the most effective, viable, scalable, affordable and sustainable way to eliminate dietary  
69 micronutrient deficiencies, especially where multiple micronutrients mixes (e.g. Vitamin A, vitamin  
70 B<sub>1</sub>, vitamin B<sub>2</sub>, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>, niacin, folic acid, iron and zinc) can be used [9]. Many  
71 countries have been fortifying their staple food like wheat flour, maize flour, sugar, rice, oil and pre-  
72 cooked corn flour since late nineties, years later a study showed that there is a decrease in iron  
73 deficiency and anaemia by 59% and 47% correspondingly in Venezuela who have been fortifying  
74 wheat flour and pre-cooked corn flour [31, 32].

75 The Government of Tanzania, which has been strongly dedicated to improving nutrition, introduced  
76 the National Multisectoral Nutrition Action Plan (NMNAP) for 2016 to 2021, which states that food  
77 fortification is a cost effective approach to reduce prevalence of micronutrient deficiencies [6]. The

78 efforts include promoting food processing enterprises to implement and sustain food fortification  
79 activities in line with standards and legislation for the fortification of wheat flour, maize flour and  
80 edible oil.

81 Based on this the National food fortification program was officially launched in Tanzania on May  
82 16<sup>th</sup>, 2013 by His Excellency Forth President of the United Republic of Tanzania [10]. The program is  
83 being overseen by a body known as Tanzania Food Fortification Alliance (TFFA) that was formulated  
84 during 2003. The TFFA comprises government Institutions, Academia, Researchers, development  
85 partners, NGOs and food processing enterprises. Food fortification standards were gazetted in 2011  
86 and legislation was passed and gazetted in 2011 which requires all food processing enterprises to  
87 fortify wheat flour, maize flour with multiple micronutrients (iron, folic acid, vitamin B12 and zinc)  
88 and edible oil with vitamin A. Currently there are about 14 large scale food processing enterprises  
89 fortifying edible oil with vitamin A and other multiple micronutrients to wheat and maize flour.

90 Meanwhile a comprehensive social mobilization and behaviour change strategy to ensure that the  
91 public is informed about issues of nutritional benefit and other behavioural measures to enhance the  
92 impact of the fortified foods was implemented country wide[10]. This study was carried out because  
93 there is limited information documented or studies conducted about the knowledge and awareness of  
94 mothers/child caretakers regarding food fortification since its commencement in the country five  
95 years ago. This study was designed to understand how mothers/child caretakers are aware of food  
96 fortification in terms of meaning of micronutrients as used in food fortification program, benefits of  
97 consuming fortified foods, types of staple foods fortified with micronutrients, benefits of food  
98 fortification and health benefits of important micronutrients used in food fortification program in  
99 Tanzania. Results from this study will have impact in planning the most appropriate strategies for  
100 conducting social mobilization regarding food fortification intervention in the country. Hence, this  
101 study was conducted to assess the levels of knowledge and awareness during November 2017 to  
102 evaluate success of social mobilization efforts to educate the mothers/child caretakers and general  
103 public regarding food fortification in Kinondoni municipality.

104 **2.0 METHODOLOGY**

105 **2.1 Study area and population**

106 The survey was conducted, primarily targeting mothers/child caretakers with child/children aged 6 to  
107 59 months attending reproductive and child health clinics in Kinondoni municipality. The survey was  
108 conducted at four health facilities of Sinza hospital, Magomeni hospital, Manzese dispensary and  
109 Tandale health Centre. A total of 200 mothers/child caretakers were interviewed. The sample size  
110 distribution in 4 health facilities was as indicated in table 1.

111

112

113 **Table 1: Sample size distribution of mothers/child caretakers in the four health facilities**  
114 **surveyed**

<b>Health facility</b>	<b>Sample size (n)</b>	<b>Percent (%)</b>
Sinza Hospital	26	13.0
Magomeni Hospital	39	19.5
Manzese Dispensary	81	40.5
Tandale Health Centre	54	27.0
<b>Total</b>	<b>200</b>	<b>100</b>

115 **2.2 Data collection and analysis**

116 Team of enumerators who were recruited and oriented was responsible for administering a pre-tested  
117 structured close-ended questionnaire in the cross-sectional study design. Mothers/child caretakers who  
118 were present at Reproductive and Child Health (RCH) clinics during the interview were briefed on  
119 purpose of the study. Data collection was done only to mothers/child caretakers with children aged 6-  
120 59 months volunteered to participate in the study. Data entry was done in excel spreadsheets and  
121 descriptive statistics (percentages) were generated using excel pivot.

122 **3.0 RESULTS AND DISCUSSION**

123 **3.1 Socio-economic and demographic characteristics of mothers/child caretakers**

124 The socio economic and demographic characteristics of 200 mothers/child caretakers in the surveyed  
125 area are given in table 2. The results showed that, 100% of the mothers/child caretakers were females  
126 aged between 18 to 50 years old. About 26% of the mothers/child caretakers were involved in  
127 entrepreneurship while 5% of the mothers/child caretakers were employed in a formal sector. The  
128 majority (67.5%) of mothers/child caretakers was housewives and the remaining (1.5%) were  
129 involved in other activities. On the maximum level of education attained by the mothers/child  
130 caretakers, 52% completed primary school, 32% completed secondary school, while 8% completed  
131 university/college and 4% never attended school. This study suggests that majority of the  
132 mothers/child caretakers attending the reproductive and child health clinics are women aged between  
133 18 to 50 years. This age is within the recommended reproductive age of 15-49 years for women [1, 2,  
134 17, 18]. These findings also resemble other studies in East Africa which reported that women are  
135 often seen attending child health clinics compared to men [15, 16]. Other similar studies conducted in  
136 Kenya and Myanmar showed that the majority of caretakers were female with age between 18-85  
137 years [21] and 15-68 years [21] respectively.

138 **Table 2: The socio economic and demographic characteristics of mothers/child caretakers**

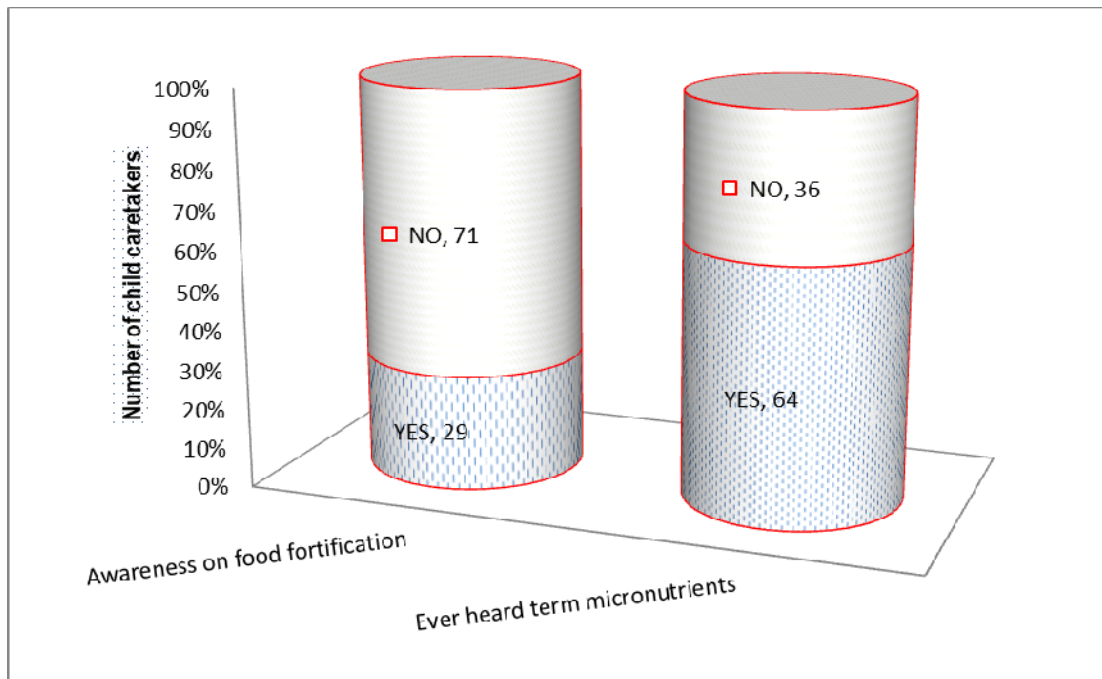
Variable	Frequency(n=200)	Percentage (%)
<b>Age of mother/child care taker</b>		
Between 18 and 50 years	200	100
<b>Gender</b>		
Female	200	100
Male	0	0
<b>Level of education</b>		
University/college	16	8
Secondary school incomplete	9	4.5
Secondary school complete	64	32
Primary school incomplete	3	1.5
Primary school complete	104	52
Adult education	0	0

Never attended school	4	2
<b>Major occupation for income generation</b>		
Agriculture	0	0
Entrepreneurship	52	26
Employed	10	5
House Wife	135	67.5
Other	3	1.5
<b>Number of children</b>		
<b>Total number</b>	<b>200</b>	<b>100</b>

139

140 **3.2 Mothers/child caretakers awareness on micronutrients**

141 The survey also investigated the mothers/child caretakers if have heard the term micronutrients.  
142 The results of the investigation on the awareness regarding micronutrients are given in Figure 1.  
143 When the mothers/child caretakers were asked if have heard the term micronutrients as used in  
144 food fortification program in Tanzania, 64% responded that have heard the term micronutrients  
145 while 36% responded that have not heard the term micronutrients. The results suggested that most  
146 of the mothers/child caretakers had heard the term micronutrients as used in food fortification  
147 program in Tanzania which is consistent with study conducted in Northwest of Iran that showed  
148 mothers were aware about use of micronutrient [33]. Moreover, the result of the current study  
149 shows improvement when compared to the previous survey on consumers aged from 18 to 55  
150 years regarding their knowledge on food fortification and nutrition that found Tanzanian  
151 consumers are not fully aware with food fortification aspects [24].



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153

154 **Figure 1: Mothers/child caretakers ever heard term micronutrients and awareness on food**  
155 **fortification**

### 156 3.3 Awareness on Food fortification

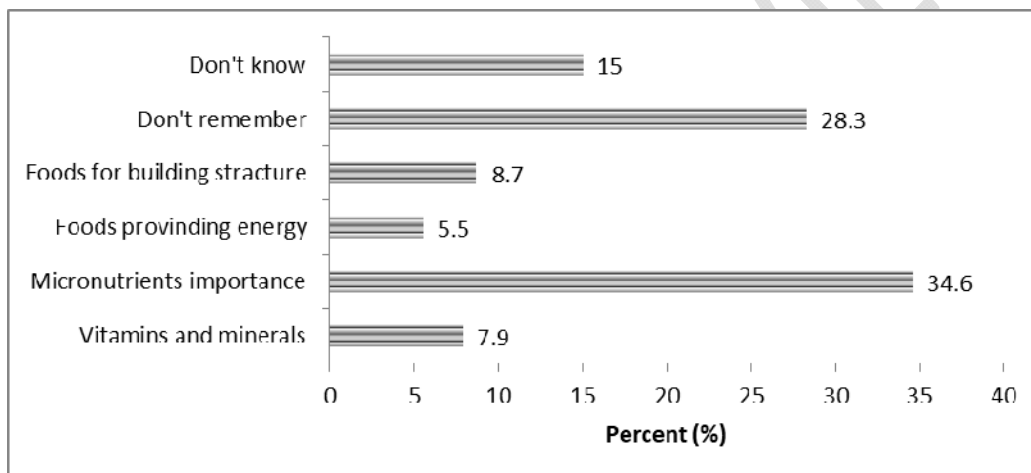
157 The results of the investigation on the awareness regarding food fortification are given in Figure 1.  
158 When the mothers/child caretakers were asked if have heard the term 'food fortification', 71% %  
159 responded that have not heard the term food fortification while 29% responded that have heard the  
160 term food fortification. The above results showed that food fortification awareness is very low among  
161 mothers/child caretakers in Kinondoni municipality. The result of this study is consistent with the  
162 survey on knowledge of food fortification and nutrition that found Tanzanian consumers aged from 18  
163 to 55 years are not fully aware with food fortification [24].

### 164 3.4 Knowledge on micronutrients

165 The mothers/child caretakers, who have heard the term micronutrients, were asked to give the  
166 meaning of the term micronutrients. When prompted further, only 7.9% of the mothers/child  
167 caretakers were able to define correctly the meaning of micronutrients, which are the vitamins and



168 minerals. The remaining mothers/child caretakers were not able to give any answer or gave incorrect  
169 answers about the meaning of micronutrients as used in food fortification program in Tanzania. The  
170 result on the knowledge on micronutrients is given in Figure 2. The study revealed that majority of the  
171 mothers/child caretakers did not know the definition of the term micronutrients as used in food  
172 fortification program. The findings of this study are consistent with the previous study on Knowledge  
173 Attitudes and Practices (KAP) regarding micronutrients in India which revealed that respondents had  
174 poor information on micronutrients [28]. Inability to define term micronutrients may be contributed  
175 by ignorance and lack of nutrition education among mothers/child caretakers in the country.  
176



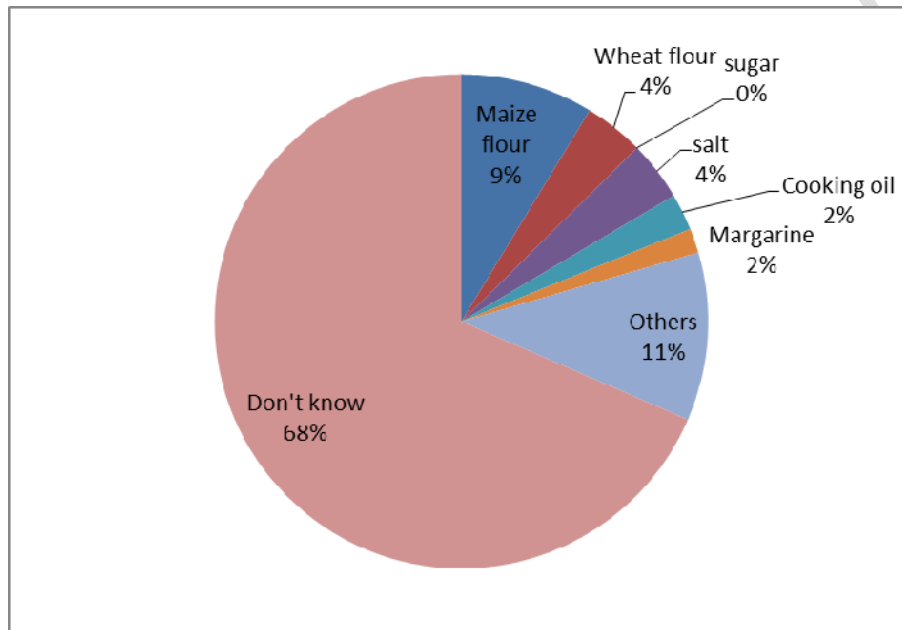
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178 **Figure 2: Mothers/child caretakers who are aware of the meaning of term micronutrients**

### 179 **3.5 Types of foods fortified with micronutrients**

180 The mothers/child caretakers were asked about their knowledge regarding the types of food products  
181 fortified with micronutrients in Tanzania. The results in Figure 3 indicated that 9% of the  
182 mothers/child caretakers mentioned maize flour, 4% mentioned wheat flour. Further analysis revealed  
183 that 4% mentioned salt, 2% mentioned edible oil and 2% of the mothers/child caretakers mentioned  
184 margarine. On other hand 68% of the mothers/child caretakers responded that don't know types of  
185 foods which are fortified with micronutrients while 11% mentioned other foods. The result of this  
186 study also revealed that mothers/child caretakers had poor information on foods which are fortified

187 with micronutrients. The result of this study is consistent with the survey on Tanzanian consumers  
188 aged from 18 to 55 years about their knowledge of food fortification and nutrition that found  
189 Tanzanian consumers are not fully aware with food fortification [24]. Based on this study, only 29%  
190 of the mothers/child caretakers gave the correct types of foods fortified with micronutrients which are  
191 edible oil, sembe flour, wheat flour and salt according to Tanzania national food fortification program  
192 [24, 25].

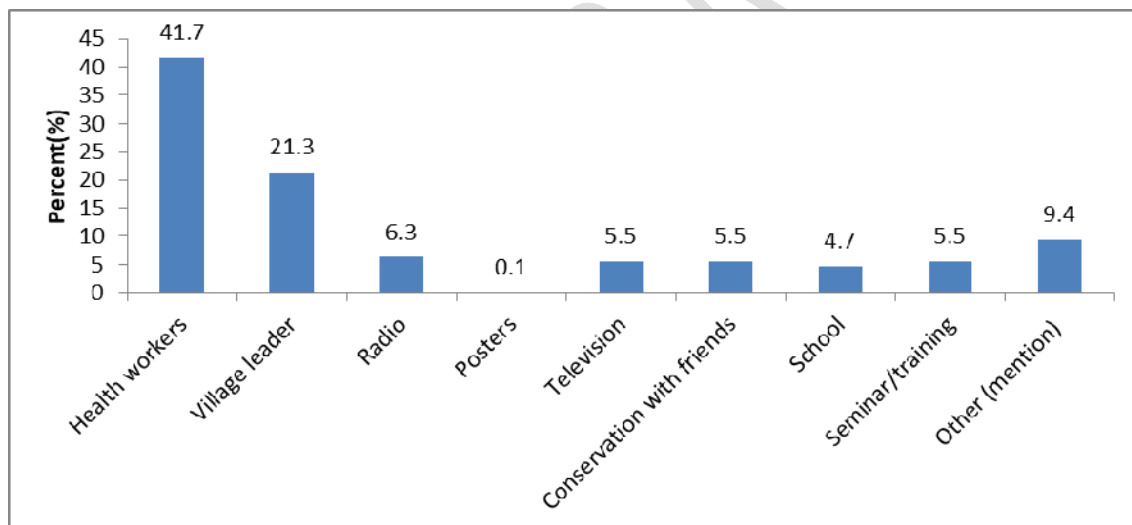


193  
194 **Figure 3: Foods which are fortified with micronutrients**

### 195 3.6 Main sources of information on food fortification

196 The main sources of information for the mothers/child caretakers who said were aware of food  
197 fortification are given in Figure 4. The main source of information was from health workers (41.7%),  
198 village leader (21.3%), radio (6.3%), seminar/training (5.5%), Television (5.5%). Other sources of  
199 information were school (4.7%), conversation with friends (5.5%) and 9.4% of the mothers/child  
200 caretakers received information from other sources. The most under- utilised source of information  
201 was posters (0.1%). The current findings are consistent with the previous research reported in  
202 Tanzania that the main source of information on health and nutrition related interventions for  
203 caregivers (mothers) attending the health facilities were health workers followed by mass media

204 (radio and television) [19, 26]. Other research on the knowledge of food fortification in Philippines  
205 reported that health workers were the main source of information for the primary caregivers on  
206 knowledge of food fortification [23]. A similar KAP study in Pakistan regarding folic acid showed  
207 that health workers are the most effective source of information reported by majority of the  
208 respondents [30]. In contrast, other findings were reported on the awareness of food fortification in  
209 the Philippines that food stores and supermarkets followed by radio were the main sources of  
210 information mentioned by mothers with malnourished children [20]. Other studies on consumer  
211 awareness of food fortification in Kenya revealed that the main source of information of food  
212 fortification reported by consumers was media [21] and another study in India reported media and  
213 read on the products labels [22]. Therefore, dissemination of nutritional information and food  
214 fortification awareness through the health workers and community leaders would be more effective in  
215 the study area.

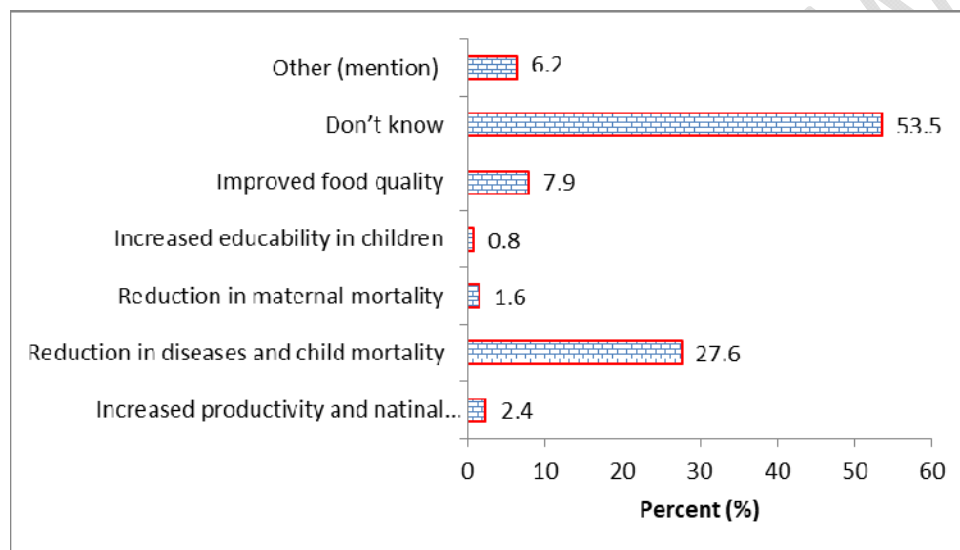


216  
217 **Figure 4: main sources of information**

### 218 3.7 Benefits of food fortification

219 The mothers/child caretakers who were aware of food fortification also were asked to mention the  
220 benefits of food fortification. The results for the analysis of the benefits of food fortification are  
221 indicated in Figure 5. The findings showed that 7.9% of the mothers/child caretakers mentioned  
222 improved food quality, 0.8% increased educability in children, 1.6% reduction in maternal mortality,

223 27.6% reduction in diseases and child mortality and 2.4% increased productivity and national  
 224 economy. **On the other hand**, 53.5% of the mothers/child caretakers don't know the benefits of food  
 225 fortification while 6.3% mentioned other benefits. Generally, this study suggests that majority of the  
 226 mothers/child caretakers in Kinondoni Municipality had low knowledge on the benefits of food  
 227 fortification. The benefits of food fortification or consumption of fortified staple foods reported in  
 228 other studies include **it improved health status** of children, prevent micronutrient deficiency and  
 229 **increased appetite** [23].



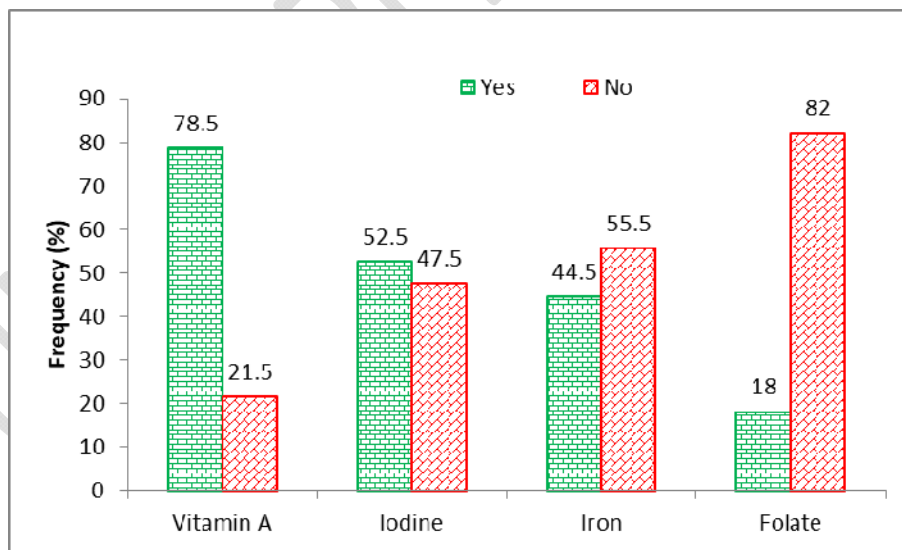
230  
 231 **Figure 5: Benefits of food fortification.**

### 232 3.8 Mothers/child caretakers awareness on individual micronutrients

233 Mothers/child caretakers were asked on whether they have ever heard of selected micronutrients  
 234 (vitamin A, Iron, Folic acid and Iodine) that are used in food fortification program in Tanzania. The  
 235 results on the awareness of individual micronutrients are given in Figure 6. The results showed that  
 236 78.5% of the mothers/child caretakers have heard of vitamin A, 52.5% of the mothers/child caretakers  
 237 have heard of iodine, 44.5% have heard iron and only 18% of the mothers/child caretakers have heard  
 238 of folic acid (**folate**). The results showed that 78.5% and 52.5% mothers/child caretakers had adequate  
 239 knowledge on vitamin A and iodine respectively. The high awareness for vitamin A is mainly due to  
 240 the twice yearly national campaign on vitamin A supplementation that has been going on for several

241 years in Tanzania. On the other hand, there was no similar campaign for folic acid, iodine and iron.  
242 Another similar findings from the previous study conducted in Chennai India found that 90% of the  
243 participants have heard about vitamin A [38]. In contrast to the current study, a related research  
244 conducted in pre and postnatal mothers in Kenya found low awareness on vitamin A [37]. Also, a  
245 study conducted in Norway found out that 51.5% and 58.9% of the pregnant women and lactating  
246 women respectively reported to have heard and knew what iodine is [40]. Previous studies in  
247 Australia and South Africa reported that women and patients respectively have little knowledge  
248 about iodine [41, 42]. The moderate awareness for iodine may be due to the fact that national  
249 fortification of salt with iodine has been going on since 1990 hence the public are somehow aware  
250 [25]. The low awareness of Iron and Folic acid (folate) among the mothers/child caretakers from the  
251 current study are consistent with the previous study regarding awareness on micronutrients among  
252 Filipino population groups [27]. In other previous study regarding knowledge revealed that 23.9%  
253 student had never heard of vitamin A, while 29.6% and 20.7% student had never heard of Iron and  
254 Iodine respectively [28].

255



256

257

**Figure 6: Mothers/child caretakers awareness on individual micronutrients**

258 **3.9 Foods fortified with micronutrients (vitamin A , iodine, iron and folic acid)**

259

260 **Table 4: Foods fortified with vitamin A , iodine, iron and folic acid (folate)**

Foods	Micronutrient			
	Vitamin A	Iodine	Iron	Folic acid (folate)
	Percent (%)			
Salt	0	38	2	2
Maize flour	0	0	3	17
Wheat flour	1	1	4	0
Margarine	10	0	3	0
Edible oil	3	0	0	0
Don't know	86	61	87	78
Other	0	0	1	3

261

262 When enquired about which foods are fortified with vitamin A, iodine, iron and folic acid, 38% of the  
263 mothers/child caretakers responded that salt is fortified with iodine, 4% responded that wheat flour is  
264 fortified with iron, 17% responded that maize flour is fortified with folic acid, 10% responded that  
265 margarine is fortified with vitamin A and 3% responded that edible oil is fortified with vitamin A. The  
266 results on the assessment are indicated in table 4. This study suggests that more than 60% of the  
267 mothers/child caretakers don't know the types of foods which are fortified with vitamin A, iodine,  
268 iron and folic acid. The awareness on fortified food products and the type of micronutrients is very  
269 low among the mothers/child caretakers in Kinondoni municipality. These findings concur with the  
270 previous study conducted in Tanzania regarding consumer awareness on food fortification [24].

271 **3.10 Mothers/child caretakers knowledge regarding health benefits of vitamin A**

272 The results on health benefits of vitamin A are given in table 5. When the mothers/child caretakers  
273 were asked about their knowledge regarding the health benefits of vitamin A, 8.3% of the  
274 mothers/child caretakers responded that vitamin A prevents blindness, 22. 3% responded that vitamin  
275 A improves immunity against diseases such as diarrhea, 1.3% responded that vitamin A prevents  
276 respiratory tract infections and measles, 3.2% responded that vitamin A promotes child growth and

277 development. Additionally, findings revealed that more than 50% of the mothers/child caretakers did  
 278 not know the health benefits of vitamin A. This study revealed that there was significantly less  
 279 knowledge regarding the health benefits of vitamin A among the mothers/child caretakers in  
 280 Kinondoni municipality. The previous study on Knowledge Attitudes and Practices regarding  
 281 micronutrient in secondary school student revealed that majority of students were aware of at least  
 282 one function of vitamin A in the body, this include important for eye sight, healthy skin, better growth  
 283 and prevent illness [28]. The findings were similar to a previous study conducted in Chennai India  
 284 where it was found that only 26% of the respondents knew the functions of vitamin A [38]. Another  
 285 study conducted in Kenya regarding knowledge on vitamin A supplementation benefits was generally  
 286 low among caregivers of children 6-59 months [39].

287 **Table 5: Health benefits of vitamin A**

<b>Descriptions</b>	<b>Frequency (n)</b>	<b>Percent (%)</b>
Prevents blindness	13	8.3
Improves immunity against diseases such as diarrhea	35	22.3
Prevents respiratory tract infections and measles	2	1.3
Promotes child growth and development	5	3.2
Helps in fetus growth	0	0.0
Don't know	80	56.0
Other	14	8.9

288

289 **3.11 Mothers/child caretakers knowledge regarding health benefits of iodine**

290 The study also investigated the knowledge of mothers/child caretakers on health benefits of iodine  
 291 which is added to salt as recommended by the national food fortification program. The results (table  
 292 6) showed that 69% of the mothers/child caretakers don't know the health benefits of iodine, 9%  
 293 responded that iodine prevents child being borne with physical deformity, 3% responded that iodine  
 294 prevent goiter and 4% responded that iodine prevents child being borne with impaired mental  
 295 capability . The current study revealed that there was low level of knowledge regarding the health  
 296 benefits of iodine among the mothers/child caretakers in Kinondoni municipality. Other research  
 297 revealed that at least one benefit of iodine was known by 59.2% of students which include prevention

298 of goiter and important for mental development of child [28]. The previous study in Norway  
 299 revealed that lactating women had more knowledge about the health benefits of iodine than  
 300 pregnant women; 45.7% correctly mentioned health benefits of iodine as important for normal  
 301 child growth and development, 17.1% for normal fatal development, and 48.0% for maintaining  
 302 normal metabolism [40].

303

304 **Table 6: Health benefits of iodine**

<b>Descriptions</b>	<b>Frequency (n)</b>	<b>Percent (%)</b>
Prevents child being borne with physical deformity	9	9
Prevents goiter	3	3
Prevents child being borne with impaired mental capability	4	4
Don't know	71	69
Other	16	15

305 **3.12 Mothers/child caretakers knowledge on health benefits of iron**

306 Knowledge regarding the health benefits of iron was analyzed to know whether mothers/child  
 307 caretakers are knowledgeable with the benefits of iron that is added to wheat and maize flour as  
 308 recommended by national food fortification program. The results (table 5) showed that more than  
 309 80% of the mothers/child caretakers don't know the health benefits of iron. About ten percent of the  
 310 mothers/child caretakers responded that iron prevents low hemoglobin, one percent responded that  
 311 iron improves school performance in children and one percent responded that iron protects fetus  
 312 during pregnancy. From this study it is clear that majority of the mothers/child caretakers have no  
 313 idea on the health benefits of iron. In contrast to this study, previous study conducted in China found  
 314 majority of women of reproductive age (67%) knew various important of iron especially during  
 315 pregnancy, for wellbeing of mothers and for the growth and development of foetus [33].

316 **Table 7: Health benefits of iron among mathers/child caretakers**

<b>Descriptions</b>	<b>Frequency</b>	<b>Percent (%)</b>
---------------------	------------------	------------------------



Prevents low hemoglobin	9	10
Improves school performance in children	1	1
Protects fetus during pregnancy	1	1
Don't know	66	82
Other	5	6

317

### 318 3.13 Mothers/child caretakers knowledge on health benefits of folic acid

319 Knowledge on health benefits of folic acid was analyzed to know whether the mothers/child  
320 caretakers are knowledgeable with the benefits of folic acid that is added to wheat and maize flour.  
321 The results (table 8) showed that 75% of the mothers/child caretakers responded that they don't know  
322 the health benefits of folic acid, 14% responded that folic acid helps in development of red blood cells  
323 and 11% responded that folic acid helps in fetus growth. The awareness regarding health benefits of  
324 folic acid among the mothers/child caretakers was not satisfactory. Similar study conducted at Turkish  
325 hospital reported 48.2% of women of reproductive and pregnant women were aware on importance of  
326 folic acid in prevention of congenital anomalies [35]. Also another study conducted in Japan found  
327 majority of pregnant women (70.4%) knew about the protective effect of folic acid [36].

328 **Table 8: Health benefits of folic acid**

Descriptions	Frequency (n)	Percent (%)
Helps in proper brain growth	0	0
Helps in development of red blood cells	5	14
Helps in fetus growth	4	11
Don't know	27	75
Other	0	0

329

## 330 4.0 CONCLUSION

331 The knowlege and awareness regarding food fortification survey conducted in four health facilities of  
332 Kinondoni municipality found that the level of knowledge on food fortification for mothers/child  
333 caretakers is very low, thus it is estimated that 7.9 percent have heard about food fortification. The  
334 major source of information on food fortification reported by the child care takers who have heard  
335 about food fortification was the health service providers (41.7 percent). Generally, the majority of

336 the mothers/child caretakers were not aware about food fortification and lack adequate general  
337 knowledge on health benefits of selected micronutrients that are used in food fortification program in  
338 Tanzania . The findings of this study further revealed that knowledge and awareness on food  
339 fortification has no influence with income, level of education and age of the child care takers. The  
340 study concludes that there is a need to conduct intensive social mobilization campaign to create  
341 awareness among the mothers/child caretakers and the general public on the importance of fortified  
342 food and general food fortification program in Tanzania.

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