



Asian Journal of Epidemiology

ISSN 1992-1462

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Knowledge of Healthcare Professionals on the Use of Micronutrient and the Prevention of Micronutrient Malnutrition in Ibadan Nigeria

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ABSTRACT

Little is known about micronutrient use and the prevention of micronutrient malnutrition among healthcare professionals in developing countries. This study was conducted to determine the general knowledge of healthcare professionals on the use micronutrients and determine the ability of healthcare professionals to prevent micronutrient malnutrition. Descriptive study was conducted at the University College Hospital, Ibadan Nigeria on selected healthcare professionals. Data was analysed using chi square. First hypothesis on knowledge of micronutrient had a level of significance less than 0.05 ($p < 0.05$); this implied that healthcare professionals are significantly knowledgeable about micronutrient. The second hypothesis determined prevention of micronutrients malnutrition by healthcare professionals; had a level of significance less than 0.05 ($p < 0.05$). The result implied that healthcare professionals are significantly able to prevent micronutrient malnutrition. More females participated compared to males because nurses were the largest number of healthcare professionals and they were mostly females.

Key words: Knowledge, micronutrients, healthcare professionals, malnutrition

INTRODUCTION

Over the last two decades, studies have shown that the micronutrients play more fundamental roles in the aetiology and or prognosis of disease (Willett and Stampfer, 2001). Micronutrients play a central part in metabolism and in the maintenance of tissue function. There is growing interest in the role of the micronutrients (essential trace elements and vitamins) in optimizing health and in prevention or treatment of disease (Shenkin, 2006). An adequate intake therefore is necessary but provision of excess supplements to people who do not need them may be harmful. However, foods fortified with micronutrients may not meet fully the needs of certain nutritionally vulnerable subgroups such as pregnant and lactating women, or young children (WHO., 2004).

Micronutrients have therefore come to be recognized as important factors in disease prevention and health promotion and giving prominence to nutritional education and nutritional intervention, both aspects of health education. These recent developments stem from the recognition that many micronutrients function as antioxidants (Diplock, 1991; Drewnowski and Darmon, 2005). Three major intervention strategies are available for the control of micronutrient malnutrition: Supplementation of the specific micronutrients; fortification of foods with micronutrients and horticulture intervention to increase production and nutrition education to ensure regular consumption of micronutrient rich foods (Vijayaraghavan, 1995; Frank *et al.*, 2000). Antioxidants being substances which counteract the damaging or harmful effects of free radicals to biological molecules such as proteins, fats, nucleic acids, enzymes and carbohydrates in the body.

Antioxidants are mainly obtained from fruits, vegetables, cereals, nuts and supplements normally; antioxidants concentration should match the rate of generation of free radicals. When an imbalance occurs as a result of insufficient supply, increased demand or increased consumption, or greater free radical burden, a state of oxidative stress is said to exist. In which case, free radicals dominate in their action to cause diseases. These free radicals have been implicated in the aetiology of almost all known diseases or disorders (Tolonen, 1990; Woodside *et al.*, 2005). Among the diseases or disorders in which free radicals have been implicated are cancer of various sites, coronary, heart disease, diabetes respiratory diseases, liver disease, alcohol induced disorders, hypertension, cataract, rapid or premature aging, genetic disorders, neuronal degenerative diseases etc. (Tolonen, 1990; Holick, 2004). Also, an inappropriate diet has been estimated to contribute approximately 35% of all cancer cases in humans (a study carried out in a region in China) (Chen *et al.*, 2008).

Studies reveal that once this state develops, it may be reversed or ameliorated by increased supply of antioxidant micronutrients and this has yielded encouraging epidemiological benefits in the prevention of cancer in a highly susceptible population in China (Holick, 2004; Chen *et al.*, 2008; Al-Naggar and Chen, 2011). It is therefore crucial and cannot be emphasized that the prescribing fraternity should be well-informed about nutrition and its role in maintaining health.

It has been documented from various studies that awareness regarding nutrition is increasing in the general population and also among specific groups of people like athletes, people undergoing cancer therapy and healthcare professionals (Frank *et al.*, 2000; Harrison, 2010; Sharma *et al.*, 2014).

Despite the awareness being created about the great potential benefits and promise of this emerging field of immense public health significance, most healthcare professionals are still at the traditional level of micronutrients understanding and practice (Tolonen, 1990; Diplock, 1991; Frank, 2004). It has also been documented that despite strategies employed to tackle micronutrient malnutrition, limited progress has been achieved in the developing countries (Van Horn, 2006; Dairo and Ige, 2009; Berti *et al.*, 2014). This undesirable situation calls for investigation especially in a centre like the University College Hospital in Ibadan Nigeria which is a centre of excellence and one of the biggest hospitals with skilled workers in West Africa.

This study therefore determined the magnitude of the problem so as to devise strategies for healthcare professionals to take advantage of the potential benefits of knowledge of micronutrients and the prevention of micronutrient malnutrition as a weapon against disease and maintenance of optimum health.

MATERIALS AND METHODS

Design and participants' selection: The descriptive survey research method was used for this study. Purposive sampling technique was used to select 5 healthcare groups: Doctors, Nurses, Pharmacists, Physiotherapists and Medical Laboratory Scientists from the 9 Healthcare groups at the University College Hospital, Ibadan. This group of professionals was selected in terms of availability to patients or individuals in the hospital, as well as the numerical strength of each professional group. Proportionate sampling technique was used to select 182 participants from the selected professionals according to the numerical strength of the selected professionals as follows: Doctors 15% = 45 out of 300; Nurses 15% = 68 out of 450. Twenty-five percent of the other three

professionals were selected as follows because of their relative small number: Pharmacists 25% = 25 out of 100; Physiotherapists 25% = 23 out of 90 and medical laboratory scientist 25% = 21 out of 85. However, 130 participants (71%) returned their questionnaire completely filled and were finally analyzed for the study.

Instrument: Self developed structured questionnaire was the instrument used for this study. This instrument contained 21 items (section A comprised of 5 questions-demographic and section B comprised of 16 questions testing variables of the study).

Statistical analysis: The instrument was validated using Pearson product moment correlation to establish the reliability ($R = 7.0$). The descriptive statistics of percentages and mean and the inferential statistics of variance, standard deviation and Chi-square (P^2) were also used to analyze the data. A level of significance of 0.05 was adopted for the study.

RESULTS AND DISCUSSION

Demographic data of respondents: Most of the healthcare professionals in this study were females (Table 1), this may be due to the number of nurses in the study (68) and most of nurses in the University College Hospital in Ibadan are females.

The first null hypothesis tested at the 0.05 level of significance stated that healthcare professionals are not significantly knowledgeable about micronutrients.

The $P^{\text{'''}}$ observed value was 607.38 and the P^2 critical value was 36.74 while the degree of freedom was 27 (Table 2). All questions asked had a level of significance less than 0.05 ($p < 0.05$). This is also made clearer in Fig. 1 which shows that over 65% of the participants had general knowledge of about micronutrient. Therefore, the hypothesis is confirmed significant. This supports a logical conclusion that healthcare professionals are significantly knowledgeable about micronutrient. This supports the finding from previous studies where it was documented that awareness regarding nutrition is increasing in the general population and also among specific groups of people like athletes, people undergoing cancer therapy and healthcare professionals (Frank *et al.*, 2000; Harrison, 2010; Sharma *et al.*, 2014).

However, the result of this investigation appears contrary to a similar study in developed country on micronutrients where it was found that medical journals had to make deliberate effort in publishing on micronutrient to increase awareness of doctors and other healthcare professional (Diplock, 1991; Harrison, 2010). Also, Tolonen (1990) had earlier observed that most healthcare professionals have difficulty in answering nutritional questions correctly because of their inadequate training in nutritional medicine.

From this study, one can confidently infer that healthcare professionals at the University College Hospital Ibadan are sufficiently knowledgeable about micronutrients. This could be due to

Table 1: Frequency distribution of respondents by sex

Value label	Value	Frequency	Percentage	Cum (%)
Males	1	47	36.2	36.2
Females	2	83	63.5	100.0
Total	130			
Mean	1.638			
Std dev	482			
Variance	233			

This table shows that there are more females than males in the study

Table 2: General knowledge of healthcare professionals about micronutrients

Parameters	Options				Total	X ² (observed)	df	P	X ² crit.	Decision
	SD	D	A	SA						
Fo	52.0	69.0	6.0	3.0	3.30	607.38	27	0.05	36.74	Significant
Fe	40.0	53.1	4.6	2.3	10.00	607.38	27	0.05	36.74	Significant
Fo	2.0	5.0	66.0	57.0	130.00	607.38	27	0.05	36.74	Significant
Fe	1.5	3.8	50.8	43.8	10.00	607.38	27	0.05	36.74	Significant
Fo	7.0	7.0	62.0	54.0	130.00	607.38	27	0.05	36.74	Significant
Fe	5.4	5.4	47.7	41.5	10.00	607.38	27	0.05	36.74	Significant
Fo	30.0	46.0	44.0	10.0	130.00	607.38	27	0.05	36.74	Significant
Fe	23.1	35.4	33.8	7.7	10.00	607.38	27	0.05	36.74	Significant
Fo	0.0	1.0	57.0	72.0	130.00	607.38	27	0.05	36.74	Significant
Fe	0.0	0.8	43.8	50.8	10.00	607.38	27	0.05	36.74	Significant
Fo	2.0	8.0	51.0	69.0	130.00	607.38	27	0.05	36.74	Significant
Fe	1.5	6.2	39.2	53.1	10.00	607.38	27	0.05	36.74	Significant
Fo	0.0	7.0	57.0	66.0	130.00	607.38	27	0.05	36.74	Significant
Fe	0.0	5.4	43.8	50.8	10.00	607.38	27	0.05	36.74	Significant
Fo	37.0	50.0	32.0	11.0	130.00	607.38	27	0.05	36.74	Significant
Fe	28.5	38.5	24.6	8.5	10.00	607.38	27	0.05	36.74	Significant
Fo	14.0	28.0	61.0	27.0	130.00	607.38	27	0.05	36.74	Significant
Fe	10.8	21.5	46.9	20.8	10.00	607.38	27	0.05	36.74	Significant
Fo	17.0	21.0	62.0	30.0	130.00	607.38	27	0.05	36.74	Significant
Fe	13.1	16.2	47.7	23.1	10.00	607.38	27	0.05	36.74	Significant
Total										
Fo	161.0	242.0	498.0	399.0	1300.00	607.38	27	0.05	36.74	Significant
Fe (%)	12.4	18.6	38.3	30.7	100.00	607.38	27	0.05	36.74	Significant

All variables tested were significant

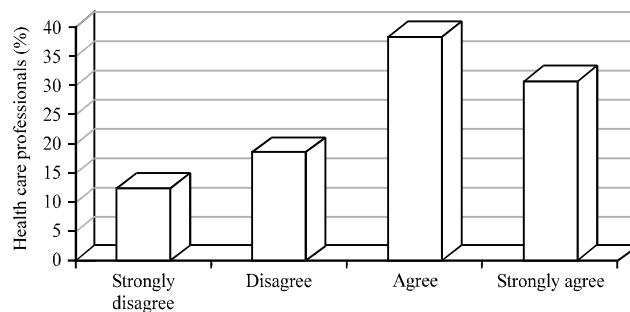


Fig. 1: Percentage of general knowledge of health care professionals about micronutrients

the fact that most (72%) of the healthcare professionals are University graduates (Table 3) and must have had a relevant training on micronutrients. Secondly, they could have benefited from deliberate effort to correct this gap in knowledge earlier observed in developed countries since they were relatively young, most of them were below 36 years of age (Table 4) and were abreast of current development in the field of micronutrients. This finding is encouraging especially since healthcare professionals play an enormous role in molding the public opinions and beliefs regarding health-related issue.

The second null hypothesis stated that healthcare professionals are not significantly able to prevent micronutrient malnutrition.

Table 3: Frequency distribution of respondents by professional qualification

Value label	Value	Frequency	Percentage	Cum (%)
RNM	1	24.0	18.5	18.5
RNM, RPON	2	12.0	9.2	27.7
MBBS	3	38.0	29.2	56.9
B. Pharm	4	15.0	11.5	68.5
BSc Med. Lab science	5	17.0	13.1	81.5
BSc Physio	6	11.0	8.5	90.0
BSc Nursing	7	6.0	4.6	94.6
Others	8	7.0	5.4	100.0
Total	130	100.0		
Mean	3.623			
Std dev	1.989			
Variance	3.958			

Valid cases 130 Missing cases 0

Table 4: Frequency distribution of respondents by age

Value label	Value	Frequency	Percentage	Cum (%)
21-25	1	11.0	8.5	8.5
26-30	2	26.0	21.5	30.0
31-35	3	42.0	32.3	62.3
36-40	4	23.0	17.7	80.0
41-45	5	15.0	11.5	91.5
46+	6	11.0	8.5	100.0
Total	130	100.0		
Mean	3.277			
Std dev	375			
Variance	1.892			

This table shows that most of the respondents are young and between ages 31-35 years

The result of the P^2 calculated value was 313.92 and the critical value was 22.31 while the degree of freedom was 15 (Table 5). All questions asked have a level of significance less than 0.05 ($p < 0.05$). Therefore, the result is significant this implies that healthcare professionals are significantly able to prevent micronutrient malnutrition.

However, looking at the near equivocal responses by the healthcare professionals in Fig. 2 with disagree and strongly disagree (46%) to agree and strongly agree (54%); this indicates a bit of shallow or lack of indebted understanding of being able to prevent micronutrient malnutrition probably to an extent of disease prevention. This apparent lack of indebted understanding may be attributable to inadequate working experience by at least 50% of the respondents who had below 6 years working experience (Table 6). Previous studies by Diplock (1991) and Horton (2006) had indicated the need of having a good knowledge and experience to prevent micronutrient malnutrition especially as a good balanced diet will vary from person to person according to his or her particular need and as such a general advice has little practical value. Going by the near equivocal responses of the health practitioners; one would infer that they did not quite reflect this understanding. This also supports the findings of Tolonen (1990), Diplock (1991) and Frank (2004) that despite the awareness being created about the great potential benefits and promise of this emerging field of immense public health significance, most healthcare professionals are still at the traditional level of micronutrients understanding and practice.

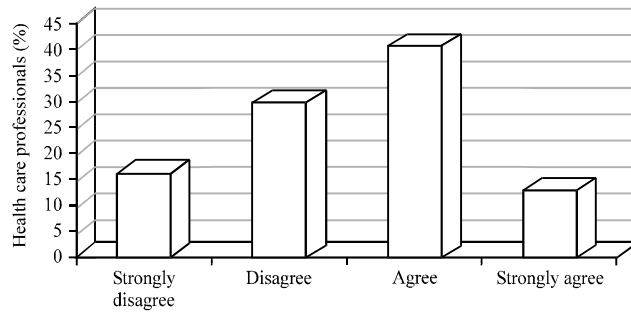


Fig. 2: Summary of the ability to prevent micronutrient malnutrition by healthcare professionals

Table 5: Ability to prevent micronutrient malnutrition by healthcare professionals

Micronutrient	Options				Total	X ² (observed)	df	X ² crit.	P	Decision
	SD	D	A	SA						
Fo	1.0	6.0	77.0	46.0	130.0	313.92	15	22.31	0.05	Significant
Fe	0.8	4.6	59.2	35.4	16.7	313.92	15	22.31	0.05	Significant
Fo	3.0	3.0	62.0	62.0	130.0	313.92	15	22.31	0.05	Significant
Fe	2.3	2.3	47.7	47.7	16.7	313.92	15	22.31	0.05	Significant
Fo	6.0	23.0	71.0	30.0	130.0	313.92	15	22.31	0.05	Significant
Fe	4.6	17.7	54.6	23.1	16.7	313.92	15	22.31	0.05	Significant
Fo	27.0	38.0	45.0	20.0	130.0	313.92	15	22.31	0.05	Significant
Fe	20.8	29.2	34.6	15.4	16.7	313.92	15	22.31	0.05	Significant
Fo	2.0	1.0	71.0	56.0	130.0	313.92	15	22.31	0.05	Significant
Fe	1.5	0.8	54.6	43.1	16.7	313.92	15	22.31	0.05	Significant
Fo	38.0	59.0	24.0	9.0	130.0	313.92	15	22.31	0.05	Significant
Fe	29.2	45.4	18.5	6.9	16.7	313.92	15	22.31	0.05	Significant
Total										
Fo	77.0	130.0	350.0	22.3	780.0	313.92	15	22.31	0.05	Significant
Fe (%)	9.9	16.7	44.9	28.6	100.00	313.92	15	22.31	0.05	Significant

Table 6: Frequency distribution of respondents by years of experience

Value label (years)	Value	Frequency	Percentage	Cum (%)
0-5	1	66.0	50.8	50.8
6-10	2	26.0	20.0	70.8
11-15	3	22.0	16.9	87.7
16-20	4	5.0	3.8	91.5
21-25	5	7.0	5.4	96.9
26	6	4.0	3.1	100.0
Total	130	100.0		
Mean	2.023			
Std dev	1.350			
Variance	1.821			

Valid cases 130 Missing cases 0

However, the general significant responses ($p < 0.05$) got from the healthcare professionals could be attributed to the fact that they are mostly university graduates and have gained some knowledge about micronutrients during the course of their training and their educational level make them readily accept new concepts. This is obviously a good trait observed in healthcare

professionals at the University College Hospital, Ibadan as it shows a relative empowerment about micronutrient malnutrition. This agrees with the observation in previous studies that revealed that healthcare professionals must be empowered with adequate knowledge to prevent micronutrient malnutrition (Harrison, 2010; Spencer *et al.*, 2006).

CONCLUSION

Although, the knowledge of the use of micronutrients and the prevention of micronutrient malnutrition among healthcare professionals is relatively high, there appears to be a dearth of indebt understanding regarding the prevention of micronutrient malnutrition. It is crucial this information be re-emphasized to healthcare professionals saddled with the responsibility of creating a positive impact on the health of the society.

ACKNOWLEDGMENT

The author thanks Babalola J.D. and Anetor J.I. for manuscript preparation.

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