Original Research Article

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Knowledge, attitudes and practices about goiter among population in Shendi provence. River Nile state of Sudan

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ABSTRACT

Background: Globally, about 2 thousand million people are affected by iodine deficiency. The aim of this study is to Knowledge, attitudes and practices regarding goiter among population in Shendi Provence. River Nile State of Suda. **Methods:** This study was conducted as a community based descriptive Cross – sectional study. In this study 636 households were included .Questionnaire were used as tools for data collection. The households were selected through a multistage cluster-sampling technique, three cluster stage was used (The locality was divided into four administrative units, All administrative units were divided into cluster villages or block and The required number of households in each village and block was selected by following the systemic random sampling technique) 636 respondents were selected.

Results: The study was found that (58.5%) of respondents were recognize goiter disease as an enlargement of thyroid gland. More than sixty (63.4%) were aware of the causes of goiter and its symptoms, (56%) were aware of iodine. More than half of respondents (55.8%) were aware of sources of iodine, (47%) of respondents were aware of foods contain iodine and its types. In addition, study revealed that (41%) of participant were aware of iodized salt. Moreover (48%) of respondents consider that iodized salt is necessary. The results revealed that only 82 (12.9%) were applied Preventive measures.

Conclusions: The overall knowledge of respondent regarding goiter were found to be good, they had negative attitude towards goiter and they had proper practice in consumption of food contain.

Keywords: Knowledge, Attitude, Practice, Goiter, Iodine, Deficiency, Disorder

INTRODUCTION

Iodine deficiency is a major public health problem for populations throughout the world, particularly for pregnant women and young children. They are a threat to the social and economic development of countries. The most devastating outcomes of iodine deficiency are increased prenatal mortality and mental retardation – iodine deficiency is the greatest cause of preventable brain damage in childhood which is the primary

motivation behind the current worldwide drive to eliminate it.1

Etiology

The main factor responsible for iodine deficiency is a low dietary supply of iodine. It occurs in populations living in areas where the soil has low iodine content as a result of past glaciations or the repeated leaching effects of snow, water and heavy rainfall. Crops grown in this soil,

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therefore, do not provide adequate amounts of iodine when consumed.¹

Health consequences

Iodine is present in the body in minute amounts, mainly in the thyroid gland. Its main role is in the synthesis of thyroid hormones. When iodine requirements are not met, thyroid hormone synthesis is impaired, resulting in hypothyroidism and a series of functional and developmental abnormalities grouped under the heading of iodine deficiency disorders.

Goiter is the most visible manifestation of IDD. Endemic goiter results from increased thyroid stimulation by thyroid stimulating hormone (TSH) to maximize the utilization of available iodine and thus represents maladaptation to iodine deficiency. However, the most damaging disorders induced by iodine deficiency are irreversible mental retardation and cretinism. If iodine deficiency occurs during the most critical period of brain development (from the fetal stage up to the third month after birth), the resulting thyroid failure will lead to irreversible alterations in brain function. In severely endemic areas, cretinism may affect up to 5-15% of the population. A meta-analysis of 19 studies conducted in severely iodine deficient areas showed that iodine deficiency is responsible for a mean IO loss of 13.5 points in the population. While cretinism is the most extreme manifestation, of considerably greater significance are the more subtle degrees of mental impairment leading to poor school performance, reduced intellectual ability and impaired work capacity. 1

The thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body. Thyroid hormone helps the body use energy, stay warm and keep the brain, heart, muscles, and other organs working as they should.²

The most common thyroid disease in the community is simple (diffuse) physiological goiter. Ultrasonography has been used in epidemiological studies to assess thyroid size, leading to much higher estimates of goiter prevalence than in studies in which goiter size was assessed by physical examination. In cross-sectional surveys, the prevalence of diffuse goiter declines with age, the greatest prevalence is in pre-menopausal women, and the ratio of women to men is at least 4:1.7 this is in contrast to the increase in frequency of thyroid nodules and thyroid antibodies with age. In a study of 5234 subjects aged .60 years in Framingham, clinically apparent thyroid nodules were present in 6.4% of women and 1.5% of men.8 The prevalence of single thyroid nodules was 3% and multinodular goiter was 1%.3

Objectives

The overall objective of this study, to study knowledge, attitude and practice regarding goiter among population in Shendi Provence River Nile State, Sudan.

METHODS

Shendi locality is one of the localities of River Nile State. It is bounded by Khartoum state in the south, Elddamer locality to the north, River Nile to the west and Gadarif state to the east. The locality area is about 14596 Km.² The rural areas of the Shendi locality are composed of about 96 villages, 63 of them are at southern side of the locality. Topographically, the Locality lies on a flat mudsandy area adjacent to the River Nile with a few scattered mountains in the eastern part and is accessible all the year. Geographically it lies between lines 36 east to 31 west longitudinal and line 19 north to line 15 south latitudinal in the arid zone of Sudan with an annual rainfall ranging between 0 and 119/ml per year. It is situated on the main River Nile, which is the source of water for the agriculture. The main cash crops are white beans, onions, wheat and sorghum. Goats and camels are reared both by the few nomadic 'Rashaida' and the settled farmers,

Culturally the population of Shendi is a mixture of the various cultures that occur in Sudan though the Northern tribes, particularly ElGaalien, are predominant. The population of Shendi locality is estimated to be about 269446. About 60 % of the population is rated as poor. Growth Rate: 2.3%, Male 48.7%, Female 51.3%. In addition, the average of family size is 6 members. 78% of the population depends upon the agriculture while the rest are traders, teachers and handicraft workers, including spinners, weavers and other artisans.

Study design is a community based descriptive cross-sectional study. The sample size was determined for study area using the formula for cluster survey. It was calculated on the bases of prevalence of 50% and design effect of 1.5.

The multistage cluster- sampling technique was followed for selecting the study population in three stage (First the locality was divided into four administrative units, the three clusters were selected using the probability proportional to size (PPS) sampling method, Second stage: All administrative units were divided into cluster villages or block (cluster sampling technique). A random sampling technique was then used on any relevant clusters to choose which villages or block to include in the study in each identified cluster and third stage: All households of the selected cluster were enlisted. An attempt was made to select an equal number of households in the unit as far as possible. The required number of households in each village and block was

selected by following the systemic random sampling technique. The sample size was distributed for each village using the following formula: K= N/n Where: (K= interval, N= population, n= sample).

Statistical analysis

After the data was collected, they were coded and transferred into specially designed formats to be suitable for computer feeding. Analysis of correlation (chi sq.) was used to find the significance of study parameters between two or more group of samples. Statistical package for social sciences (SPSS version 11.5) was used for analysis. In the analysis scores were given to each questions related to knowledge and attitude respectively. The participants who scored above the mean for knowledge questions were considered as having good knowledge while others (below mean level) were considered as having poor knowledge. Similarly, subjects who scored above the mean for questions related to attitude were considered as having positive attitude while others (below mean level) were considered as having negative attitude. In addition, participants who scored above the mean for practice questions were considered as

proper practices while others (below mean level) were considered as improper practices.

RESULTS

Knowledge Status

Responses given by the study participants to the knowledge questions were indicated in Table 1. As given in Table 2, more than half 401 (63.1%) of the respondents having knowledge about goiter disease. The study revealed that 372 (58.5%) of respondents were recognize goiter disease is an enlargement of thyroid gland. More than sixty 403 (63.4%) were aware of the causes of goiter and its symptoms. Out of 636 subjects 356 (56%) were aware of iodine. 279 (43.9%) identified that iodine is a chemical element. More than half of respondents 355(55.8%) were aware of sources of iodine. The data showed that 299 (47%) of respondents were aware of foods contain iodine and its types. 356 (56%) were aware of the fact that iodine deficiency had significant influence on the body and knew that cause goiter. In addition, study revealed that 261(41%) of participant were aware of iodized salt.

Table 1: Responses to the questions on knowledge about goiter.

Id	Knowledge	Correct answer (n = 636)				
10		n	%			
1	Knew goiter as a disease	401	63.1			
2	Recognize a goiter as disease	372	58.5			
3	Cause of goiter	403	63.4			
4	Symptom of goiter	403	63.4			
5	Knew iodine	356	56.0			
6	Recognize of iodine	279	43.9			
7	Sources of iodine	355	55.8			
8	Knew food contain iodine	299	47.0			
9	Types of food contain iodine	298	46.9			
10	Iodine deficiency disorder	356	56.0			
11	Identified iodized salt	261	41.0			

Attitude status

Responses given by the study participants to the Attitude questions are indicated, that only 134 (21.1%) of the respondents belief the iodized salt is available. The study revealed that less than half of the respondents 256 (40.3%), they consumed iodized salt to improve iodine deficiency disorder in the human body, and more than half of them 157 (61.3) they intake iodized salt monthly. In addition, 306 (48%), indicate that their opinion regarding necessity of iodized salt. For detail, see Table 3.

Practice status

Responses given to other questions assessing the practices of respondents are presented in Table 5. The results revealed that only 82 (12.9%) were applied

Preventive measures and 114 (17.9%), of respondent was detected goiter disease through early investigations. Moreover, some of the respondents 368 (57.9%) usually consume fish as a source of iodine; nearly half of them were purchase fish weekly from markets. Most of the respondents 551 (86.6%), consumed eggs, more than half of them 329 (59.7%), were purchase eggs weekly from markets. majority of respondents 601 (94.5%) consume milk, most of them 583 (97%) were consumed daily.

Effect of socio-demographic characteristic of population on their level of knowledge, attitude and practices

The level of knowledge compared with sociodemographic characteristics of study population and was presented in Table 2. Majority of the subject belonged to the employee and with level of income between 500-1000 SDG. Sixty-nine present of respondents had education with formal level. The level of knowledge showed significant association with occupation (p- 0.000),

monthly income (p- 0.000), level of education (p=0.000), and family number (p=0.05).

Table 2: socio- demographic characteristic on the level of knowledge.

		Know	ledge level		$\mid \mathbf{X}^2 \mid$	p- value	
Id	Characteristic	Good	Good				
		N	%	N	%		
1	Household occupation						
	Farmer	14.2	90	15,4	98	41.4	
	Employee	16.7	106	23.3	148		
	Provisional	15.6	99	5	32	41.4	p- 0.000
	Other	4.7	30	5.2	33		
2	Monthly income						
	Less than 500 pound	16.8	107	23.9	152	22.00	p -0.000
	500- 1000 pound	26.3	167	21.5	137		
	Above 1000 pound	8	51	3.5	22		
3	Level of education						
	Illiterate	5.8	37	11.6	78	27.42	
	Informal	5.2	33	8.2	52		p -0.000
	Formal	40.1	255	29.1	185		
4	Family number						
	Less than 6	26.6	188	27.5	175	5.89	
	6-9	18.9	120	16.4	104		p -0.052
	Above 9	2.7	17	5	32		

Table 3: Responses to the questions on attitude towards goiter.

Id	Attitude	Correct answer (n = 636)				
Iu	Attitude	n	%			
1	Availability of iodized salt	134	21.1			
	Consumption of iodized salts					
2	- Daily	52	20.3			
_	- Weekly	47	18.4			
	- Monthly	157	61.3			
3	Necessity of iodized salt	306	48.1			

Similar analysis was done comparing the attitude towards goiter, with deferent socio-demographic characteristics of population, Table 4. There were significant associations with occupation (p=0.000), monthly income (p=0.000), level of education (p=0.000). The study showed no significant association with family number (p= 0. 105). Similar analysis was done comparing the practices on goiter, with deferent socio-demographic characteristics of population, Table 5. There were no significant associations between occupations (p= 0. 073), family number (p= 0. 256). However, There were significant associations between population income ((p=0.000), level of education (p=0.002).

DISCUSSION

In general, the respondents had good knowledge of goiter, the enlargement of thyroid gland, causes of goiter

and its symptoms. Umenwanne et al, found high level of ignorance about the causes and consequences of iodine deficiency, iodine as a nutrient, and iodized salt and its purpose. The prevalence of knowledge about goiter from this study notwithstanding, perception of the causes was very poor. Some respondents attributed goiter to natural causes, poison from one's enemy, heredity, or supernatural forces. Others believed that it was caused by snoring, carrying heavy loads, talking too much, and consuming unclean food and water. 11. Similarly, during a cross sectional survey conducted by Jooste et al, only 15.4% of the selected adult population correctly identified iodized salt as the primary source of iodine and 16.2% knew that the thyroid gland needed iodine to function.⁴ Mallik et al, All the village heads of the sixteen villages and parents of 10% of the school children examined for goiter were interviewed. Initial focus group discussions were conducted as no prior knowledge about local names for goiter or other related IDD information was available. Findings regarding knowledge in the present study suggest that 56%% of the respondents

indicated that they heard about iodine and deficiency of iodine in the environment and insufficient intake of iodine in the human body.

Table 4: Association of the attitude of respondents on goiter with their socio-demographic characteristics.

		Attitude					
Id	Characteristic	Negat	ive	Positive	e	\mathbf{X}^2	p- value
		N	%	N	%		
	Household occupation						p- 0.000
	Farmer	101	15.9	87	13.7	23.20	
1	Employee	139	21.9	115	18.1		
	Provisional	43	6.8	88	13.8		
	Other	40	6.3	23	3.6		
	Monthly income						p -0.000
2	Less than 500 pound	157	24.7	102	16	25.33	
2	500- 1000 pound	145	22.8	159	25		
	Above 1000 pound	21	3.3	52	8.2		
	Level of education						p -0.000
,	Illiterate	74	11.6	37	5.8	18.83	
3	Informal	50	7.9	35	5.5		
	Formal	199	31.3	241	37.9		
	Family number						
4	Less than 6	179	28.1	184	28.9		
4	6-9	112	17.6	112	17.6	4.50	p -0.105
	Above 9	32	5	17	2.7		

Table 5: Responses to the questions on practice.

Id	Practice	Correct answer (n = 636)				
10		n	%			
1	Preventive measures	82	12.9			
2	Type of preventive measures	82	12.9			
3	Detection of goiter	114	17.9			
	Fish consumption	368	57.9			
4	daily	9	2.4			
4	week	180	48.9			
	month	179	48.6			
	Eggs consumption	551	86.6			
5	Daily	173	31.4			
3	Weekly	329	59.7			
	Monthly	49	8.9			
	Milk consumption	601	94.5			
6	daily	583	97.0			
U	week	13	2.2			
	month	5	0.8			

This shows that the public awareness about iodine is not sufficient. Similar study has been done by Sebotsa*et al* in Free State South Africa showed that; majority of the patients (86.9%) indicated that they did not know what iodine is. Even those who mentioned that they knew what it is (14.1%) were not clear, because 4.9% indicated that it is a vitamin while 4.9% indicated that it is a mineral. ¹⁴Abu Sabeeb, *et al* reported that (24%) of the students did not know what iodine is. ¹³

Our study showed that about half of respondent (47%) have knowledge of food contain iodine, this was conceder poor knowledge. Charlton et al reported similar finding that dairy foods were the highest contributors to dietary iodine intake (57%–62%). A low intake of fish and seafood resulted in this food group contributing only 3%–8% of total intake. ¹⁵ More than half of population (55%) in our study has knowledge about source of iodine. Charlton, et al in study conducted in Australian women reported that knowledge of dietary sources of iodine was

also found to be poor. ¹⁶ Jooste, et al showed that, only 15.4% of respondents correctly identified iodized salt as the primary dietary

source of iodine.⁴ Sebotsa et al showed that knowledge on the main source of iodine in food consumed by the people in South Africa, a higher percentage of patients (76.7%) lacked knowledge of iodine.¹⁴

Table 6: Association of the practice of respondents on goiter with their socio-demographic characteristics.

		Pract	ice				
Id	Characteristic	Prope	r	improp	er	\mathbf{X}^2	p- value
		N	%	N	%		
	Household occupation						
	Farmer	108	17	80	12.6		
1	Employee	161	25.3	93	14.6		
	Provisional	90	14.2	41	6.4	6.97	p- 0.073
	Other	46	7.2	17	2.7		
	Monthly income						
	Less than 500 pound	135	21.2	124	19.5		
2	500- 1000 pound	207	32.5	97	15.3	33.66	p -0.000
	Above 1000 pound	63	9.9	10	1.6		
	Level of education						
3	Illiterate	60	9.4	51	8		
3	Informal	45	7.1	40	6.3	12.54	p -0.002
	Formal	300	47.2	140	22		
	Family number						
4	Less than 6	228	35.8	135	21.2		
4	6-9	150	23.6	74	11.6	2.72	p -0.256
	Above 9	27	4.2	22	3.5		

A study conducted by Charlton et al in Australia reported that poor knowledge about the role and sources of iodine in the diet remained after fortification.¹⁶

The result of our study show that more than half of respondent (56%) have knowledge about iodine deficiency disorder. Niksic et al reported that only half of the participants (49.1%) know of iodine deficiency disorder. Umenwanne, et al showed that less than 15% of the respondents could link goiter to iodine deficiency. In the control of the respondents could link goiter to iodine deficiency.

Iodized salt is the main sources of dietary iodine in Sudan population, and it has been the main strategy to control the iodine deficiency disorder. In our study less than half of respondents (41%), are correctly answer about the knowledge of iodized salt. This finding showed poor knowledge in agreement with study conducted by DeZoysa, et al, which reported that (40%) of respondent had poor knowledge on iodized salts and the importance of iodine in the diet. Buxton et al found that knowledge of iodized salt was quite high, as 72% of the respondents knew that not every salt contained iodine. The study conducted by Gerensea et al in HaweltiKebelle, found that, majority (94%) of the respondents were heard about iodized salt.

Findings regarding attitudes in the present study suggest that only (21.1%) of the respondents belief the iodized salt is available. Also the study revealed that less than half of the respondents (40.3%), they consumed iodized

salt to improve iodine deficiency disorder in the human body. Gidey, et al showed that Availability of adequate iodized salt was low, and attending formal education, having good knowledge about iodized salt and iodine deficiency disorders. ¹² Utilization of adequately iodized salt at household level was very low in the study area. The finding of this study revealed that residence of study participants; using packed salt, not exposing salt to sunlight, storing salt in dry place and storing salt in container with a lid were significantly associated with availability of adequately iodized salt at household level. ⁶

Findings regarding practice in the present study suggest that only 82 (12.9%) were applied Preventive measures and (17.9%), of respondent was detected goiter disease through early investigations.

Our study reported that some of the respondents (57.9%) usually consume fish as a source of iodine, nearly half of them were purchase fish weekly from markets, 86.6%), consumed eggs. A study conducted by Charlton *et al* showed that dairy foods were the highest contributors to dietary iodine intake (57%–62%). A low intake of fish and seafood resulted in this food group contributing only 3%–8% of total intake.¹⁶

CONCLUSION

In conclusion overall knowledge about goiter in this study population is good and about only twenty one of respondents positive attitude towards availability of iodized salt. The study revealed that there were improper practice for Preventive measures and consumption of food rich of iodine. To resolve this public health issue it is important to intensify health education programmes at various levels of community, and expressing the importance of illuminating iodine deficiency disorder.

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