



(RESEARCH ARTICLE)



## Knowledge and awareness of rural adults regarding endemic goitre

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### Abstract

Knowledge and awareness related to goitre is very much important at community level for its prevention. Goitre is an iodine deficiency disease, which is in endemic in northern part of Bangladesh. This is a community based cross-sectional study conducted in rural areas of Kaharol Upzilla of Dinajpur district from January to December 2018. Data were collected by face to face interview from one adult in each of the purposively selected 377 households and a semi-structured questionnaire was used to collect data. The study result showed that mean age of the respondents was  $36.85 \pm 12.36$  years where most of the respondents (82.2%) were female and 42.7% were illiterate. All of the respondents (100.0%) of the present study knew that endemic goitre means visible swelling in front of the neck. The present study revealed that 24.9% knew that endemic goitre is caused by lack of iodine in diet and having adequate iodine in diet was a way to prevent endemic goitre and 69.2% knew which food contained iodine. Majority of the respondents (57.2%) knew that iodized salt contains iodine. The present study revealed that 0.8% had good knowledge regarding endemic goitre, 50.1% had average knowledge regarding endemic goitre and 49.1% had poor knowledge regarding endemic goitre. Most of the respondents, (81.7%) considered iodine an important element for body and 69.5% took iodine rich food. Though, the respondents had positive awareness regarding use of iodized salt. Level of knowledge regarding endemic goitre was associated with age ( $p=0.001$ ), educational status ( $p<0.000$ ), occupational status ( $p<0.006$ ). Community based awareness program among school children, clubs, housewife etc. may increase the knowledge on endemic goitre at community members.

**Keywords:** Goitre; Endemic goiter; Iodine; Iodine Deficiency Disorders; Type of salt

### 1. Introduction

Goitre is a reflection of chronic iodine deficiency and can be used as a baseline assessment of a region's iodine status and as a sensitive long-term indicator for the success of an iodine programme. The WHO definition of goitre has been maintained since it was first proposed in 1960, as "a thyroid gland whose lateral lobes have a volume greater than the terminal phalanges of the thumbs of the person being examined". The diagnosis of goitre depends not only on the visibility of the thyroid gland but also on the degree of enlargement of the gland or on the presence of nodules in the gland. Therefore, in 1979, use of the palpation method was recommended as the most accurate and reliable way of diagnosing endemic goitre and estimating its severity [1].

Endemic goitres occur in a relatively large proportion of population in certain geographic localities of the world, where iodine content in food and water is deficient or exceedingly low. Endemic goitre results from increased thyroid

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stimulation by thyroid stimulating hormone (TSH) to maximize the utilization of available iodine and thus represents maladaptation to iodine deficiency [2].

Iodine is an essential micronutrient (100-150 microgram) required for thyroid hormones- Tri-iodothyronine (T3) and Thyroxine (T4) synthesis and it must be consumed adequately in the diet. Inadequate iodine intake leads to inadequate thyroid hormone production resulting in iodine deficiency disorders (IDD) (Park, 2015). It could result in abortion, still birth, mental retardation, deaf-mutism, squint, dwarfism, goitre, neuromotor defects etc. Thus IDD directly affects human resource development and in turn national development [3]

The Government of Bangladesh is officially committed to IDD elimination through national, as well as international, commitments. In 1989, the Government of Bangladesh passed a law making it mandatory that all edible salt be iodized. The law stipulates that all salt for human consumption must contain 45-50 parts per million (ppm) of iodine at the time of production and not less than 20 ppm iodine at the time of retail, to ensure a minimum of 15 ppm iodine at the household level. Accordingly, a plan was undertaken to institute a Universal Salt Iodization (USI) in the country [4].

Two national surveys assessing household coverage of iodized salt have shown that household use of iodized salt ( $\geq 5$ ppm) and adequately iodized salt ( $\geq 15$ ppm) had remained relatively constant since 2004; from 81% in 2004-05 to 80.3% in 2011-12 for salt with any iodine, and from 51% in 2004-05 to 57% in 2011-12 for adequately iodized salt. Despite sustaining this considerable progress, improving the quality of salt iodization beyond these levels and ensuring equitable access remains a major issue in Bangladesh and ensuring access to adequately iodized, packaged salt is a challenge. There is lack of programme data on factors associated with lower access to adequately iodized salt and, in particular, about the use of iodized salt in areas designated by the Control of Iodine Deficiency Disorders project (CIDD) project established by BSCIC as “rural low performing” areas in Bangladesh.

These are generally hard-to-reach districts with lower socioeconomic status and thus lower buying capacity of the population, known to have lower access to adequately iodized salt. Many of these areas are in border regions and in traditionally small scale salt producing coastal areas [5].

The 2011 survey demonstrated a high level of association between household salt iodine content and urinary iodine, indicating iodine deficiency among the populations of both women and children in households where the salt iodine content was  $< 15$ ppm. Based on this and the very low household coverage of adequately iodized salt in low performing areas, the 2015 survey results suggest that a large proportion of the population in these areas of Bangladesh are at high risk of iodine deficiency [5].

Accurate data on knowledge and awareness of adults regarding endemic goitre are very essential to help in the choice of interventions and thereafter in assessing the success or impact of any program that is implemented. The present study is undertaken to assess the level of knowledge of rural adults regarding endemic goitre and their awareness regarding the use of iodized salt.

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## 2. Material and methods

A descriptive cross sectional study was conducted for a period of 12 months starting from January to December 2018. The study was conducted at rural community of Chatoil, Nirmail and West Mallikpur village of Targaon union. This union is under Kaharol Upazilla of Dinajpur District. It is northern districts in Bangladesh and adult population of selected area was the study population. Purposive sampling technique was used, sample size 377. Inclusion criteria were adult population within the age range of 20-70 years with the physically and mentally sound. Face-to-face interview was conducted by a semi-structured questionnaire. The statistical analysis was conducted using SPSS (statistical package for social science) version 20 statistical software.

### 2.1. Purpose of the study

To assess the level of knowledge of rural adults regarding endemic goitre and their awareness regarding the use of iodized salt.

### 3. The discussion of the results

**Table 1** Distribution of the respondents according to Socio-demographic characteristics.

Variables	Characteristics	Frequency (f)	Percent (%)
Age (in years) mean SD 36.85 ( $\pm$ 12.36).	Up to 30	146	38.7
	31-40	131	34.7
	Above 40	100	26.5
Sex	Male	67	17.8
	Female	310	82.2
Marital status of the respondents			
	Married	339	89.9
	Widow	28	7.4
Educational status			
	Unmarried	10	2.7
	Illiterate	161	42.7
	Up to Primary	62	16.4
	Up to Secondary	107	28.4
	Higher Secondary	27	7.2
Occupation	Graduate	20	5.3
	House wife	220	58.4
	Day labor	80	21.2
	Farmer	42	11.1
	Service holder	16	4.2
Monthly family income (in taka)	Others	19	5.0
	Up to 10000	169	44.8
	10001-20000	153	40.6
Types of family	Above 20000	55	14.6
	Nuclear family	319	84.6
Family member	Joint family	58	15.4
	1-4	230	61.0
	5-6	118	31.3
	>6	29	7.7
	Total	377	100.0

Table-1 shows the socio-demographic characteristics of the respondents. Among the total respondents (n=377, 100%) were from 31-40 years age group and 38.7% (n=146) respondents were from up to 30 years age group. Rest (n=100,

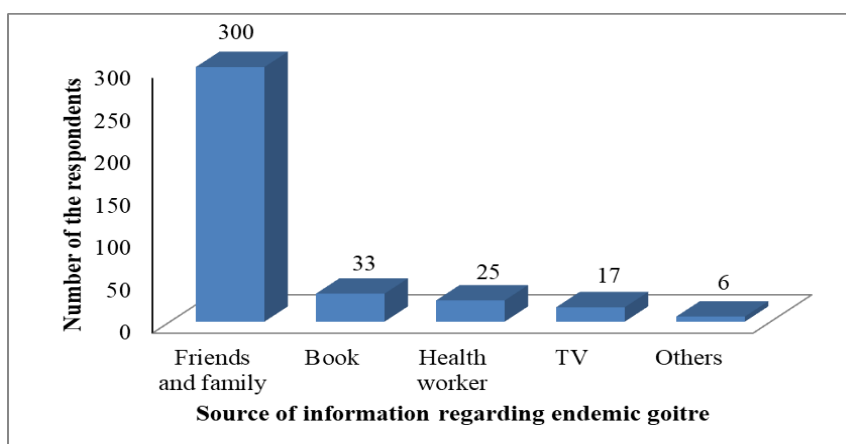
26.5%) were from above 40 years age group. The mean age of the respondents was 36.85±12.36 years. Majority of the respondents (82.2%, n=310) were female and rests (17.8%, n=67) were male. Here, (89.9%, n=339) respondents were married and 7.4% were widow and 2.7% were unmarried. Among the respondents, 42.7% (n=161) were illiterate and up to primary were 16.4% (n=62). Up to Secondary was 28.4% (n=107) respondents and Higher secondary passed was 7.2% (n=27) respondents. Out of total respondents, 58.4% (n=220) were housewives and day labors were 21.2% (n=80). Farmers were 11.1% (n=42) respondents, service holders were 4.2% (n=16) respondents. Others (5.0%) were involved in different occupations like businessmen, drivers, and students. The mean monthly family income of the respondents was 16029.18±20139.06 taka. Among the respondents 44.8% (n=169) had monthly family income up to 10000 taka and 40.6% (n=153) respondents had monthly family income from 10001-20000 taka. Rests (n=55, 14.6%) had monthly family income above 20000 taka. Majority of the respondents (84.6%, n=319) came from nuclear family and rests (15.4%, n=58) from joint family and (61.0%, n=230) respondents had family members from one to four and rest had five to six (31.3%, n=118) and above six members (7.7%, n=29) in the family.

**Table 2** Distribution of the respondents according to hearing and understanding endemic goitre.

Criteria	Frequency (f)	Percent
Heard about endemic goitre		
Yes	377	100.0
Understanding endemic goitre		
Visible swelling in front of the neck	377	100.0
Cause of endemic goitre	Frequency (f)	Percentage (%)
Known	110	29.2
Not known	267	70.8
Total	377	100.0

Table-2 shows the distribution of the respondents by hearing and understanding endemic goitre. All of the respondents (100.0%, n=377) had heard endemic goitre and knew that endemic goitre means visible swelling in front of the neck (thyroid gland). Among the respondents, 29.2% (n=110) knew the cause of endemic goitre. Others (70.8%, n=287) did not know the cause of endemic goitre.

Figure-1 shows the distribution of the respondents by source of information regarding endemic goitre. Majority of the respondents (79.5%, n=300) got endemic goitre related information from friends and family, 8.7% (n=33) respondents got endemic goitre related information from books, 6.6%, (n=25) got endemic goitre related information from health workers, TV (4.5%, n=17) and others (1.6%, n=6).



**Figure 1** Distribution of the respondents by source of information regarding endemic goitre (n=377)

**Table 3** Distribution of the respondents according to knowledge regarding endemic goitre (n=110).

Cause of endemic goitre	Frequency (f)	Percent
Lack of iodine in diet	283	74.8
Others	94	25.2
Symptoms of endemic goitre		
Palpable or visible swelling in front of the neck (thyroid gland)	377	100.0
A tight feeling in throat	1	0.3
Difficulty in swallowing	1	0.3
Difficulty in breathing	1	0.3
Hoarseness of voice	2	0.6
Treatment of endemic goitre		
Known	73	19.4
Not known	304	80.6
Total	377	100.0

Table-3 shows the distribution of the respondents according to knowledge regarding endemic goitre. Most of the respondents (74.8%, n=283) knew that endemic goitre is caused by lack of iodine in diet. Others (25.2%, n=94) stated that endemic goitre is caused by arsenic, iron, blowing in a bottle, hereditary, using open salt. Almost all of the respondents (100.0%, n=377) knew that palpable or visible swelling in front of the neck (thyroid gland) was a symptom of endemic goitre. Others stated that a tight feeling in throat (0.3%, n=1), difficulty in swallowing (0.3%, n=1), difficulty in breathing (0.3%, n=1) and hoarseness of voice (0.6%, n=2) were symptoms of endemic goitre. Among the respondents, 19.4% (n=73) knew the treatment of endemic goitre. Majority of the respondents (80.6%, n=304) did not know the treatment of endemic goitre.

Figure 2 shows the distribution of the respondents according to knowledge regarding treatment of endemic goitre. Among the respondents who stated that they knew the treatment of endemic goitre, 35.6% (n=26) knew that surgery was a treatment of endemic goitre. Others stated that adequate intake of iodine (31.5%, n=23) and medication (21.9%, n=16) were treatment of endemic goitre.

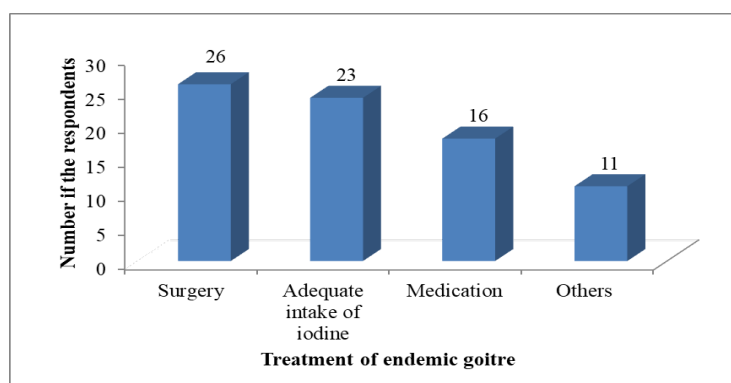
**Figure 2** Distribution of the respondents according to knowledge regarding treatment of endemic goitre (n=73).

Table 4 shows, majority of the respondents (72.9%, n=275) did not know the prevention of endemic goitre. One fourth of the respondents (24.9%, n=94) knew that having adequate iodine in diet was a way to prevent endemic goitre. Most of the respondents (57.2%, n=216) knew that iodized salt contains iodine. Others knew that vegetables (15.4%, n=58), egg (4.5%, n=17) and sea fish (2.9%, n=11) contains iodine. Among the respondents, 30.7%, (n=116) did not know which food contained iodine. Among the respondents, 46.4% (n=175) stated that iodine was needed to remain healthy, 24.1% (n=91) stated that iodine was needed to prevent goitre. Among the respondents, 34.0%, (n=128) did not know why iodine was important. Among the respondents, 33.7% (n=127) stated that they knew that iodine content reduces if iodized salt was not kept in closed container. Among the respondents, 58.9%, (n=222) did not know that iodine content reduces if iodized salt was not kept in closed container.

**Table 4** Distribution of the respondents by knowledge regarding iodine and prevention of endemic goitre (n=377).

<b>Prevention of endemic goitre</b>	<b>Frequency (f)</b>	<b>Percent</b>
Not known	275	72.9
Having adequate iodine in diet	94	24.9
Others	8	2.1
<b>Food containing iodine</b>		
Iodized salt	216	57.2
Vegetables	58	15.4
Egg	17	4.5
Sea fish	11	2.9
Not known	116	30.7
Others	4	3.3
<b>Importance of iodine</b>		
To remain healthy	175	46.4
To prevent goitre	91	24.1
not know	111	34.0
<b>Iodine content reduces if iodized salt is not kept in closed container</b>		
Yes	127	33.7
No	28	7.4
Not known	222	58.9
<b>Total</b>	<b>377</b>	<b>100.0</b>

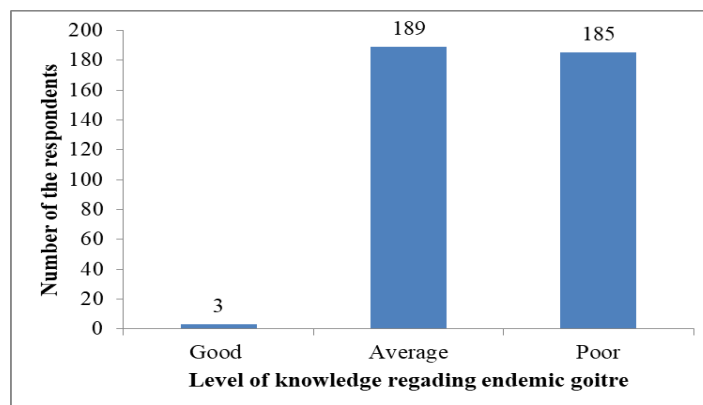
**Table 5** Distribution of the respondents according to awareness regarding use of iodized salt (n=377).

<b>Considering iodine an important element for body</b>	<b>Frequency (f)</b>	<b>Percent (%)</b>
Yes	308	81.7
No	69	18.3
<b>Taking iodine rich food</b>		
Yes	262	69.5
No	115	30.5
<b>Type of salt they buy</b>		
Always packet salt	366	97.1
Sometimes packet and sometimes open salt	9	2.4
Always open salt	2	0.5
<b>Read the label of the packet of salt</b>		
Yes	62	16.5
No	313	83.5
<b>How often they use iodized salt</b>		
Always	333	94.6
Sometimes	24	6.8
<b>Total</b>	<b>352</b>	<b>100.0</b>

Table-5 shows, among the respondents, 81.7% (n=308) considered iodine an important element for body. Others, 18.3%, (n=69) did not consider iodine an important element for body. Here, 69.5% (n=262) respondents took iodine

rich food. Others, 30.5%, (n=115) did not take iodine rich food. Most of the respondents (97.1%, n=366) always bought packet salt. Few of them (2.4%, n=9) bought sometimes packet and sometimes open salt and only (0.5%, n=2) always bought open salt. Among the respondents, 16.5% (n=62) read the label of the packet of salt. Others (83.5%, n=313) did not read the label of the packet of salt. From the total respondents, (94.6%, n=333) always used iodized salt. Rests (5.4%, n=24) sometimes used iodized salt.

Figure 3 shows the distribution of the respondents by level of knowledge regarding endemic goitre. Among the respondents, 0.8%, (n=3) had good knowledge regarding endemic goitre, 50.1%, (n=189) had average knowledge regarding endemic goitre and 49.1% (n=185) had poor knowledge regarding endemic goitre.



**Figure 3** Distribution of the respondents by level of knowledge regarding endemic goitre (n=377)

**Table 6** Association of the level of knowledge regarding endemic goitre and socio-demographic status of the respondents (n=377).

Socio-demographic status	Level of knowledge regarding endemic goitre			Test statistics
	Poor F(%)	Average F(%)	Good F(%)	
Age (in years)				
Up to 30	59(31.9)	84(44.4)	3(100)	$\chi^2=17.188^a$ df=4 p=0.001
31-40	61(33.0)	70(37.0)	0(0.0)	
>40	65(35.1)	35(18.0)	0(0.0)	
Sex				
Male	30(16.2)	36(19.0)	1(33.3)	$\chi^2=1.537^a$ df=2 p=0.602
Female	155(83.8)	153(81.0)	2(66.7)	
Educational status				
Illiterate	106(57.3)	55(29.1)	0(0.0)	$\chi^2=32.424^a$ df=2 p=0.000
Literate	79(42.7)	134(70.9)	3(100)	
Occupation				
House wife	107(57.8)	112(59.3)	1(33.3)	$\chi^2=19.090^a$ df=6 p=0.001
Day labour	50(27.0)	29(15.3)	1(33.3)	
Agricultural worker	20(10.8)	21(11.1)	1(33.3)	
Others	8(4.3)	27(14.3)	0(0.0)	

Table 6 shows association of the level of knowledge regarding endemic goitre and socio-demographic status. Highly significant statistical differences were found between level of knowledge regarding endemic goitre and age ( $p<0.05$ ),

educational status of the respondents ( $p < 0.05$ ), occupational status of the respondents ( $p < 0.05$ ). No statistical differences were found between level of knowledge regarding endemic goitre and gender ( $p = 0.602$ ) and monthly family income ( $p = 0.096$ ).

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#### 4. Conclusion

On the basis of the study following conclusion may be drawn. Regarding the knowledge about endemic goitre very few respondents had good knowledge, half of the respondents had average knowledge and rest had poor knowledge. Regarding awareness about the use of iodized salt more than ninety percentages had positive awareness. So the health educational program should be arranged to increase the knowledge regarding source and importance of iodine, cause and prevention regarding endemic goitre.

Endemic goitre is the major public health problem in our country. So based on the findings of the present study, the following recommendations were put forward.

- Awareness building programs should be conducted at various levels of community such as individual, household, vulnerable people, school students, housewife etc. regarding endemic goitre.
- The local government can take initiative for the training of health workers regarding endemic goitre.
- Non-governmental organization also should involve in arranging the health education programs.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

None to declare.

##### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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