

Pregnant Women's Awareness and Attitude towards Importance of Iodine Intake during Pregnancy at Benha University Hospital

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Abstract

Background: Adequate iodine intake during pregnancy is vital for the mother and the fetus, iodine is an essential micronutrient that is required for thyroid hormone production. **This study** aimed to assess pregnant women's awareness and attitude towards importance of iodine intake during pregnancy at Benha university hospital. **Design:** A descriptive Study design was utilized to conduct this study. **Setting:** The study was conducted at obstetrics and gynecological outpatient clinic affiliated to Benha University Hospital. **Sample:** A convenient sample used in the study, it included 143 pregnant women. **Size of sample:** all pregnant women attended at antenatal clinic for three months at time of data collection. **Tools:** The tools of data collection were: **I.** A structured interviewing questionnaire sheet and **II.** Likert scale to assess pregnant women's attitude toward importance of iodine intake during Pregnancy. **Results:** less than three quarters of the studied pregnant women had inadequate awareness about importance of iodine intake. Most of the studied pregnant women had negative attitude about importance of iodine intake. There was highly statistically significance relation between total awareness score and total attitude score of the studied pregnant women with educational level as well as occupation. Moreover there was a highly Positive statistically significant correlation between total awareness and total attitude among studied pregnant women regarding importance of iodine intake. **Conclusion:** Most of the studied pregnant women had poor awareness and negative attitude regarding iodine intake during pregnancy. Also there was a highly Positive statistically significant correlation between total awareness and total attitude among studied pregnant women regarding importance of iodine intake during pregnancy. **Recommendation:** Implementation of guidelines for modification of life style of pregnant women regarding dietary iodine intake.

Key words; Attitude, Awareness, Importance of Iodine intake, Pregnant Women.

1. Introduction

Pregnancy is a period during which physiological and anatomical changes occur so that a healthy pregnancy is maintained by preventing, identifying, and addressing preconception health issues, pregnancy readiness, early prenatal care, and minimizing risks during perinatal and the inter-conception period. Pregnant women require an increased intake of micronutrient such as protein, calcium and iodine during pregnancy, which are actively transported across the placenta to fulfill the needs of the developing fetus [1].

Iodine is a chemical element was discovered by the French chemist Bernard Courtois in 1811, iodine is important for the synthesis of thyroid hormone and is especially important in pregnancy and early life due to influence on brain development of the fetus and infant. Lack of iodine intake leads to iodine deficiency disorders (IDD) resulting in cretinism, pregnancy loss, intellectual impairments, growth retardation, infant mortality and thyroid dysfunction. Iodine supplementation to pregnant women has been shown to reduce cretinism, perinatal death, and infant mortality and improve the indices of maternal thyroid function [2].

Absence of sufficient iodine causes markable elevation in thyroid-stimulating hormone (TSH) levels leading to goiter, an enlargement of the thyroid gland that reflects the body's attempt to trap more iodine from the circulation and produce thyroid hormones. Iodine may play other physiological functions in the body as well. For example, iodine appears to play a role in immune response and might do a beneficial effect on mammary dysplasia and fibrocystic breast disease [3].

Pregnant and lactating women are vulnerable to iodine deficiency disorders because of increased iodine requirements during pregnancy. Iodine intake is essential for the production of thyroid hormone. Iodine deficiency remains a public health problem in many regions around the world. Supplementation of iodized salt prevents iodine deficiency disorders [4].

Iodine is one of the most important trace elements in human nutrition. Maternal iodine deficiency during pregnancy results in fetal iodine deficiency. The best way to ensure getting enough iodine is by eating a healthy pregnancy diet. The most important source of iodine is iodized salt, seaweeds and fish are rich sources of iodine. Populations living near the sea are eating seaweeds and reef fish such as the Chinese have a high dietary intake of iodine. There are good sources of iodine as marine fishes, shellfish, eggs, meat, milk and milk products, dried vegetables cereal grains, dried legumes, and dried fruits [5].

Antenatal care promotes the lives of mothers and fetuses and establishes good health before childbirth. Nurses are in charge of giving nutrition education and counseling to pregnant women in order to improve their nutritional status. The nurses' main focus is on promoting a healthy diet by increasing the variety and amount of food consumed, ensuring adequate weight gain through sufficient and balanced protein and energy intake, and encouraging the use of micronutrient supplements, food supplements, or fortified foods on a consistent and ongoing basis [6].

Maternal health nurses have an important role through providing health education about the importance

of iodine during pregnancy .Also in preventing iodine deficiency during pregnancy through providing health education about iodine, food rich with iodine, importance of having sufficient iodine and supplementation during pregnancy. Maternal health nurses have a vital role in providing sensitive care for women with iodine deficiency through early diagnosis and proper treatment. Early detection of iodine deficiency is important to prevent negative health consequences and complication of iodine deficiency[7].

Significance of the study:

Pregnant women are the most vulnerable group to IDD. Studies done in Egypt over last half century revealed that IDD is prevalent in most governorates of Egypt constituting a major public health problem, with varying degrees of severity. It ranged between severe public health problem in New Valley and some governorates of Upper Egypt to mild/moderate in others. About one third (28.8%) of pregnant women have inadequate iodine intake. Iodine inadequacy was prevalent among pregnant women based on dietary intake. Intake of dietary supplements containing iodine during pregnancy is recommended, with regular follow up of iodine status for pregnant women[8] .

Iodine deficiency disorder (IDD) is a major public health problem affecting all groups of people, pregnant and lactating women are the most vulnerable groups, the effect of maternal iodine deficiency and thyroid impairment on fetus includes cretinism, intellectual impairments, fetal growth retardation, neonatal hypothyroidism ,mental retardation, low birth weight, abortion, stillbirth, impaired neurodevelopment, congenital anomaly, and fetal hypothyroidism, even after birth, lower Intelligence Quotient (IQ) were observed among children of women with IDD, adverse effect of iodine deficiency on the mother including hypothyroidism ,gestational hypertension , placental abruption, neonatal mortality, miscarriage, preeclampsia, weight gain, and endemic goiter. Moreover, severe iodine deficiency may cause maternal mortality [9].

Iodine intake during pregnancy is very important for pregnant women. This study aimed to assess awareness and attitude of pregnant women toward importance of iodine intake during pregnancy.

Aim of the study and study Questions

The study aimed to assess pregnant women's awareness and attitude towards importance of iodine intake during pregnancy at Benha University Hospital.

Research Questions

- What is the level of pregnant women's awareness towards importance of iodine intake during pregnancy?
- What is the level of pregnant women's attitude towards importance of iodine intake during pregnancy?
- Is there correlation between pregnant women's awareness and attitude towards importance of iodine intake during pregnancy?

2. Subjects and method

I) Technical design

Study design

A descriptive design was utilized to achieve the aim of the study.

Study Setting

The study was conducted in obstetrics and gynecological outpatient clinic at Benha University Hospital. It is a large hospital in Benha city with high flow rate from all Qalubia Governorate and other neighbor governorates. This clinic provides obstetrical and gynecological health care services for women, as well as family planning services.

Sampling

- **Sample type :** A convenient sample was used in the study
- **Sample size:** The study subjects included (143) pregnant women was have the time of data collection at previous mentioned setting for three months.

Tools for data collection

Two main tools were used for data collection

Tool I- A structured interviewing questionnaire sheet:

This tool was constructed by the researcher after reviewing a related literature and consisted of three parts:

Part (1): Assessment of general characteristics of the studied pregnant women such as (age, occupation, residence, educational level, marital status, monthly income)

Part (2): Assessment of Obstetrical history of the studied pregnant women such as (number of pregnancy, gestational age of the current pregnancy, number of deliveries, complications of previous pregnancy, complications of previous delivery, complications of previous delivery , complications of current pregnancy, babies with congenital anomalies)

Part (3): Assessment of maternal awareness of the studied pregnant women: to assess the pregnant women' awareness about the importance of iodine intake and iodine deficiency during pregnancy It included (14 items) such as (The meaning of iodine, Importance of iodine, factors causing iodine deficiency Information about iodine, symptoms of iodine deficiency, symptoms of excess iodine in the body, consequences of iodine deficiency.)

The scoring system for the awareness :

Each item was assigned a score of (2) given when answer was correct answer, a score (1) was given when the answer was incorrect or I don't know

The total awareness score was considered good if the percent was more than 75%, average if the percent score were ranged from (60% to 75%), while it considered poor if the percent score was less than 60%.

Tool II: Likert scale for assessment of pregnant women's attitude toward the importance of iodine intake during pregnancy:

This tool was constructed by the researcher after reviewing the related literature[10] [11]. The researcher used the simple Arabic language to suit the level of women's understanding. This scale included (18 items) such as (It is necessary to get enough iodine daily, Iodine deficiency is a treatable problem, Iodine

deficiency is easily preventable ,regular follow-up during pregnancy , eating enough iodized salt and iodine-rich foods)

Pregnant women's responses were measured on three point likert scale, which were scored as the following: agree (3), neutral (2), disagree (1). **The scoring system of this part will be** as percentage score of total attitude was considered positive attitude if the percent score was > 50 % and as negative attitude if the percent score was < 50 %

Validity and Reliability of the tools:

The Content validity of the tools was reviewed by a panel of three experts in Obstetrics Gynecological Nursing and little changes in sentence wording were required. The reliability of the tools was done to check its internal consistency. The Cronbach's alpha coefficient for the tool I-part (3) (Awareness Assessment Sheet) was 0.92, and for the tool II (Modified Likert Scale for pregnant women' attitude) was 0.85.

Ethical consideration:

Ethical consideration was being considered before starting the study as the following:

- The study approval was obtained from Scientific Research Ethical Committee at Faculty of Nursing, Benha University before starting the study.
- Informed oral consent was obtained from each studied pregnant women in the study after explaining the purpose of the study.
- Each woman was informed about the right to withdrawal from the study at any time.
- All participants were not being harmed.
- All data were considered confidential and only used for purpose of research

II. Operational design:

Preparatory phase:

A reviewing of current and past national and international relevant literature related to the importance of iodine intake during pregnancy was carried out by using local and international books, journals, periodicals and computer search was done to develop the study tools and contents.

Pilot study:

The pilot study was carried out on (10%) two weeks from the total period of study to assess and evaluate the efficiency, clarity, validity and applicability of the study tools and to estimate time of data collection. No modifications were done. Therefore, women involved in the pilot were included in the study.

Field work:

- The current study was carried out for three months, from the beginning of May 2022 and completed at the end of July 2022.
- The researcher visited the previous mentioned setting 3 days/week (Saturday, Monday and Wednesday) from 9 am to 12 am.
- The researcher greeted and introduced herself to each pregnant woman in the study at the beginning of the interview then, explained the

aim of the study to each pregnant woman in the study

- The researcher obtained oral consent from each pregnant woman in the study before distribution the tools of the study to the sample that were present in the outpatient clinic at time of data collection.
- The researcher met the pregnant women in the study individually to maintain privacy and confidentially for filling tools of data collection and explained the questionnaire items to women that take 5 minutes before data collection.
- The researcher utilized **tool I**, A structured interviewing questionnaire to collect sociodemographic data and to assess level of awareness related to the importance of iodine intake that took 10-15 minutes. **Tool II**, modified likert scale was used to assess pregnant women's attitude toward the importance of iodine intake that took 5-10 minutes.
- The researcher waited until pregnant women filled in the tools and then collected them. Average time taken to complete each interview ranged from 20-30 minutes and average pregnant women's number ranged between 3-5 pregnant women per day.
- This technique was followed in all days and with all study participants until end of data collection

Difficulties and limitation of the study:

The waiting hall of the obstetrics and gynecology outpatient clinic was crowded, which required more effort and time to conduct the study.

III. Administrative design:

An official approval to conduct the study was obtained from the dean of faculty nursing to the director of Benha university hospital for taking their permission to conduct the study and seek their support. The study was conducted concerned the title, objectives, tools. The study technique was illustrated to administrator of the previously mentioned setting to gain their cooperation which was needed to allow investigator to meet the pregnant women at antenatal clinic

Statistical analysis:

Computerized Data entry and statistical analysis were done using the Statistical Package for Social Science (SPSS version 22.0). Descriptive statistics were first applied included numbers,(tables, figures, diagrams frequencies and percentages, means and standard deviations). then Inferential statistics as (Chi-square test, Fisher Exact Test) and Pearson correlation coefficient were used For all of the statistical tests done.

Statistical significance was considered at:

P-value > 0.05 indicated no statistical significant difference,

P-value ≤ 0.05 indicated a statistical significant difference,

P-value $P \leq 0.001$ indicated a highly statistically significant difference.

3. RESULTS

Table (1): shows that, 49.7% of the studied pregnant women were in age group 25 < 30 years old with the mean age of 28.12±3.99 years. 98.6 of the studied pregnant women were married. Concerning educational level, 49.7% of the studied pregnant women had secondary education. Regarding occupation, 74.8% of the studied pregnant women were house wife. 67.8% and 71.3% of the studied pregnant women were living in rural area and had insufficient monthly income respectively.

Table (2): clarifies that, 86.7%, 88.1%, 89.5%, and 86.0% of the studied pregnant women had incorrect answer regarding reason for body demands for iodine during pregnancy, factors causing iodine deficiency, effect of iodine deficiency on the mother, Problems caused by excessive iodine to the fetus and problems caused by excessive iodine to the fetus respectively. As well as, 83.9%, 82.5% and 81.1% of the studied pregnant women had incorrect answer regarding symptoms of iodine deficiency, symptoms of excessive iodine in the body. Moreover, 74.8%, 70.6%, 74.1, 76.9%, 70.6% and 76.2% of the studied pregnant women had incorrect answer regarding meaning of iodine, importance of iodine, effect of iodine deficiency on the fetus, ways to know percentage of iodine in the body, food rich in iodine and ways to prevent iodine deficiency respectively.

Table (3): illustrates that, 63.6%, 65.7%, 60.8% and 63.6% of the studied pregnant women recorded disagree answer regarding the items of Iodine is an essential and necessary element for thyroid gland and the growth of the fetus, Complications of iodine deficiency include difficulty breathing, weight gain, difficulty concentration and miscarriage for the pregnant women, There is relationship between iodine deficiency and cretinism, and Eating enough iodized salt and iodine rich food helps prevent thyroid problems respectively. Also, 53.8%, 52.4%, 57.3%, 51.0%, and 53.8% of the studied pregnant women recorded disagree answer regarding the items of Iodine deficiency is the cause of goiter, Iodine deficiency limit the thyroid gland ability to produce thyroid hormones, Iodine intake is important to prevent disease during pregnancy, Iodine deficiency is treatable problem and Iodine deficiency is easily preventable respectively.

Table (4) illustrates that, there was a highly Positive statistically significant correlation between total awareness and total attitudes scores among studied pregnant women regarding importance of iodine intake during pregnancy.

Figure (1): shows that, more than half 58.1% of the studied pregnant women who had information about iodine intake during pregnancy were from the health team members.

Figure (2): shows that, less than three quarters 70.6% of the studied pregnant women had poor total awareness score regarding iodine intake during pregnancy.

Figure (3): shows that, less than two thirds 63.6% of the studied pregnant women had poor total attitude score regarding iodine intake during pregnancy.

Table (1) Distribution of the studied pregnant women according to their general characteristics (n=143).

General characteristics	No	%
Age (years)		
20 < 25	30	20.9
25 < 30	71	49.7
> 30	42	29.4
Mean \pmSD	28.12 \pm 3.99	
Marital status		
Married	141	98.6
Widow	2	1.4
Educational level		
Illiterate	3	2.1
Basic education	15	10.4
Secondary education	71	49.7
University education	54	37.8
Occupation		
House wife	107	74.8
Employee	36	25.2
Residence		
Rural	97	67.8
Urban	46	32.2
Monthly income		
Sufficient	41	28.7
Insufficient	102	71.3

Table (2) Distribution of the studied pregnant women regarding their awareness about importance of iodine intake during pregnancy (n=143).

Awareness Items	Correct answer		Incorrect answer	
	No	%	No	%
The meaning of iodine	36	25.2	107	74.8
Importance of iodine	42	29.4	101	70.6
Reason for body demands for iodine during pregnancy	19	13.3	124	86.7
Factors causing iodine deficiency	17	11.9	126	88.1
Symptoms of iodine deficiency	23	16.1	120	83.9
Symptoms of excessive iodine in the body	25	17.5	118	82.5
Effect of iodine deficiency on the mother	15	10.5	128	89.5
Effect of iodine deficiency on the fetus	37	25.9	106	74.1
Problems caused by excessive iodine to the fetus	20	14.0	123	86.0
Problems caused by excessive iodine to the mother	27	18.9	116	81.1
Ways to know percentage of iodine in the body	33	23.1	110	76.9
Food rich in iodine	42	29.4	101	70.6
Ways to prevent iodine deficiency	34	23.8	109	76.2

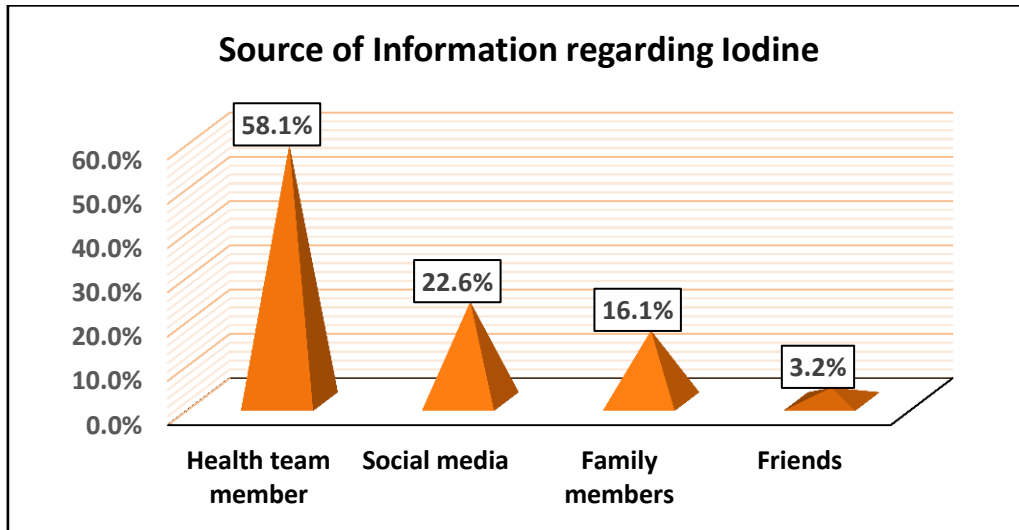


Fig (1). Percentage distribution of studied pregnant women regarding source of information about iodine intake during pregnancy (n=31)

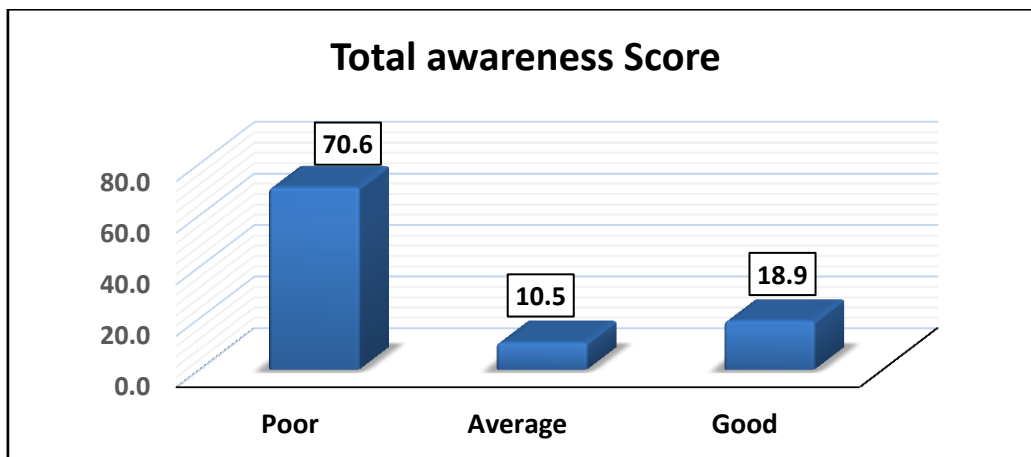


Fig (3) Percentage distribution of studied pregnant women regarding total awareness scores about importance of iodine intake during pregnancy (n=143)

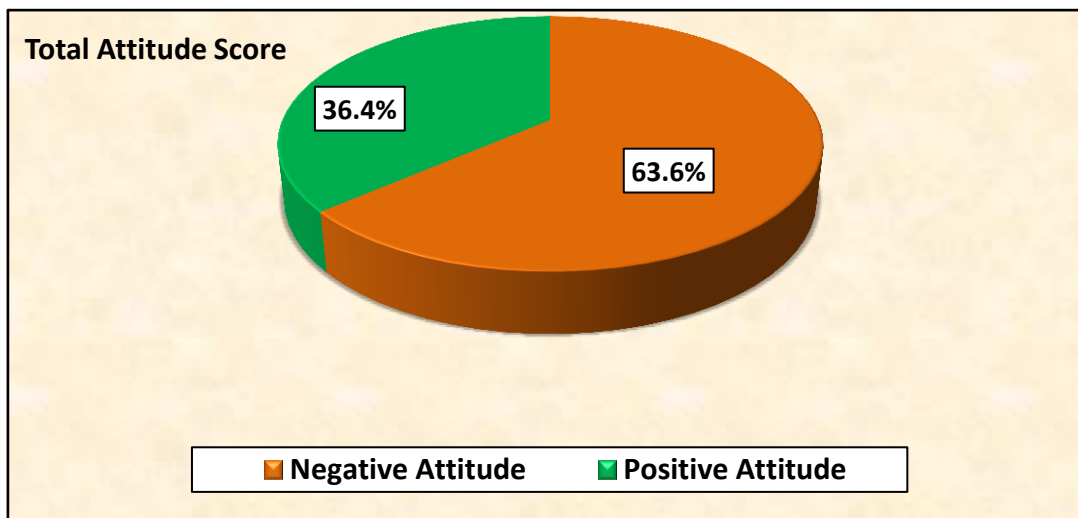


Fig. (4) Percentage distribution of studied pregnant women regarding total attitude scores about importance of iodine intake during pregnancy (n=143)

Table (3) Distribution of studied pregnant women regarding their attitude about importance of iodine intake during pregnancy (n=143).

Attitude' items	Agree		Sometimes		Disagree	
	No	%	No	%	No	%
Iodine intake is important during pregnancy	42	29.4	37	25.9	64	44.7
It is necessary to get enough iodine daily	39	27.3	35	24.5	69	48.2
Iodine is necessary to prevent congenital malformation of the fetus	48	33.6	40	27.9	55	38.5
Iodine is an essential and necessary element for thyroid gland and the growth of the fetus	36	25.2	16	11.2	91	63.6
Iodine deficiency is the cause of goiter	30	20.9	36	25.3	77	53.8
Iodine deficiency limit the thyroid gland ability to produce thyroid hormones	29	20.3	39	27.3	75	52.4
Complications of iodine deficiency include difficulty breathing, weight gain, difficulty concentration and miscarriage for the pregnant women	18	12.6	31	21.7	94	65.7
There is relationship between iodine deficiency and cretinism	25	17.5	31	21.7	87	60.8
Iodine intake is important to prevent disease during pregnancy	33	23.1	28	19.6	82	57.3
Iodine deficiency is treatable problem	38	26.6	32	22.4	73	51.0
It is important to educate pregnant women about the importance of iodine intake during pregnancy	41	28.7	35	24.5	67	46.8
Iodine deficiency is easily preventable	34	23.8	32	22.4	77	53.8
Women' educational level affect their awareness about the importance of iodine intake during pregnancy	43	30.1	39	27.3	61	42.6
Eating enough iodized salt and iodine rich food helps prevent thyroid problems	26	18.2	26	18.2	91	63.6
Regular follow-up during pregnancy to raise women's awareness of the importance of iodine intake during pregnancy is necessary	38	26.6	35	24.5	70	48.9

Table (4) Correlation between total awareness score, and total attitude scores among studied pregnant women (n=143).

Variables		Total attitude
Total awareness	r	0.87
	p-value	0.000**

**A Highly statistical significant $p \leq 0.001$

4. Discussion

According to the general characteristics of the studied pregnant women; the current study showed that less than half of the studied pregnant women were in age group $25 < 30$ years old with the mean age of 28.12 ± 3.99 years. Most of the studied pregnant women were married. This finding was in the same line with study performed by [12] on pregnant women, in Saudi Arabia, aimed to measure urine iodine concentrations (UIC) alongside the potential socioeconomic factors contributing towards iodine inadequacy in reproductive age and pregnant women; stated that the mean age of pregnant women was 28.7 ± 5.7 . **In the researcher point of view** this might be because this is the most appropriate age for marriage. On the other hand, this finding disagreed with [2], studied that "Iodine status during pregnancy and post-partum at four Norwegian health regions, Norway" (n=1004), who found that the mean age of pregnant women was 30.2 ± 4.8 .

Regarding educational level of the studied pregnant women, the finding of the present study displayed that less than half of the studied pregnant women had secondary education. This finding was in agreement with [8], who performed a study about awareness of pregnant women toward Iodine Intake

during Pregnancy, and reported that less than half of the studied women had secondary education. **In the researcher point of view** this may be due to the low socioeconomic status of women who have not completed education because most of the rural families prefer to married their girls than to complete their education and women prefer to stay at home. On the other hand, this finding disagreed with study performed by [12] on pregnant women, in Saudi Arabia, aimed to measure urine iodine concentrations (UIC) alongside the potential socioeconomic factors contributing towards iodine inadequacy in reproductive age and pregnant Saudi women found that more than half of pregnant women had a university diploma 56.8%.

Regarding occupation of the studied pregnant women, the finding of the present study displayed that about three quarters of the studied women were house wife. This result supported with study conducted by [13], about "The Relationship between Iodine Nutrition. Thyroid Function and Obstetrical Outcomes for Jordanian Pregnant Women" and reported that most of the studied women were unemployment. **In the researcher point of view** this may be due to social beliefs such as considering women's work outside the

home unnecessary, most of the studied women not completed the education and living in rural area prefer to stay at home.

As regards residence, the present study reported that most of the studied women were living in rural area. This result also agreed with a study performed by [2], demonstrated that majority of the studied women residing in the rural areas. On the other hand this finding disagreed with [14] performed a study on iodine status in pregnant women of puerto rico'' found that 73.7 % were from urban area.

Regarding to the monthly income about two thirds of the studied women had insufficient monthly income respectively. This result matched with a study performed by [15], about knowledge on Importance of Iodine Intake among pregnant women, and stated that about two thirds of the studied pregnant women not had enough monthly income, **in the researcher point of view** ,This might be due to that more than of pregnant women were unemployed. On the other hand, incongruent sample socio-demographic characteristics studied by[12] on pregnant women, in Saudi Arabia, aimed to measure urine iodine concentrations (UIC) alongside the potential socioeconomic factors contributing towards iodine inadequacy in reproductive age and pregnant Saudi women found that about two thirds of the studied women had sufficient monthly income respectively.

Regarding information received about importance of iodine intake during pregnancy, the current study revealed that more than three quarters of the studied women do not receive information about importance of iodine intake during pregnancy. This finding disagreed with study performed by[16] about "Iodine knowledge is positively associated with dietary iodine intake among women of childbearing age in Ireland" reported that about two thirds of the studied women received information about iodine intake previously **In the researcher point of view** this returns to the shortage level of awareness about intake of iodine during pregnancy. Moreover, may return to the level of antenatal care.

Concerning source of information regarding iodine intake during pregnancy, the present study revealed that more than half of the studied pregnant women received information about iodine intake from health team member, less than one-third of studied women from social media, less than one-fifth of the studied pregnant women received information about iodine intake from family member followed by the minority of the studied pregnant women received information about iodine intake from friends. This finding in the same line with [11]studied "Assessment of iodine knowledge, beliefs and practices of pregnant women attending Western Australia's only tertiary women's and neonatal hospital" revealed that more than half of the women received their dietary information from a doctor, followed by the internet then a midwife . On the other hand, this result disagreed with the findings of study conducted by [17] entitled "Assessment of Knowledge and Practice of iodized Salt Utilization and Associated Factors Among Pregnant Women in

Debreberhan Town" determined that more than half of the studied women receive information about iodine deficiency from social media, less than one-third from friends, family, and neighbors, and less than half from printed material (newspaper and brusher). **In the researcher point of view** May be due to the difference of culture between the studied communities and the difference in the educational level related to cultural differences between study samples and cultures.

Regarding awareness of the studied pregnant women about identification of the food that rich in iodine, the current study revealed that more than two-thirds of the studied women had incorrect answer about foods that rich in iodine, This result nearly in the same line with the study by [13] about "The Relationship between Iodine Nutrition, Thyroid Function and Obstetrical Outcomes for Jordanian Pregnant Women", reported that only 27.6% of the studied women knew about the food that rich sources of iodine. **In the researcher point of view** that the pregnant women not received antenatal health education about sources of iodine and the shortage level of awareness about the food rich in iodine. On the other hand This finding disagreed with study performed by [16] about "Iodine knowledge is positively associated with dietary iodine intake among women of childbearing age in Ireland" reported that more than half of the studied women identified fish and seafood as the richest source of iodine.

The current study clarifies that, more than four fifth of the studied pregnant women had incorrect answer regarding symptoms of iodine deficiency, reason for body demands for iodine during pregnancy, factors causing iodine deficiency, effect of iodine deficiency on the mother, Problems caused by excessive iodine to the fetus and problems caused by excessive iodine to the fetus respectively. This finding was consistent with study performed by[18] about The Status and Knowledge of Iodine among Pregnant Women in Shanghai reported that only 8.3% of the pregnant women were aware of the harm of iodine deficiency to the fetus and the mother and factors causing iodine deficiency. **In the researcher point of view** that the studied pregnant women not received adequate information about importance of iodine intake and the low level of education lead to the shortage level of awareness about intake of iodine during pregnancy

This findings were inconsistent with *Meseret ,et al.,(2018)* who performed a large cross-sectional study about knowledge and practice of iodized salt utilization among reproductive women in Addis Ababa city and found that more than three quarters of the studied women recorded significantly higher correct answer score regarding factors causing iodine deficiency, effect of iodine deficiency on the mother, Problems caused by excessive iodine to the fetus and problems caused by excessive iodine to the fetus

Moreover, about three quarters of the studied pregnant women had incorrect answer regarding meaning of iodine, importance of iodine, ways to know percentage of iodine in the body, food rich in iodine and ways to prevent iodine deficiency respectively. This

finding was consistent with study performed by [18] entitled "The Status and Knowledge of Iodine among Pregnant Women in Shanghai" reported that more than three quarters of the studied pregnant women didn't had sufficient nutrition and diet during pregnancy. **In the researcher point of view** may be due to educational level and nature of study sample that most of women from rural area led to inadequate knowledge.

Related the women's awareness about consequences of iodine intake deficiency during pregnancy, the current study proved that slightly more than three-quarters of the pregnant women not knew the consequences of iodine intake deficiency during pregnancy. This finding agreed with *Abu-Baker, et al., (2021)* who carried out a quasi-experimental study about knowledge, attitude and practices of pregnant women in Jordan toward Importance of iodine intake during pregnancy proved that about three quarters of the studied women recorded not knew the consequences of iodine intake deficiency. **In the researcher point of view** may be due to lack of sources that provide information about iodine intake deficiency, the consequences and complications of iodine intake deficiency

On the other hand, the result of the present study inconsistent with finding proved by *Almuzaini,etal.,(2019)* in a study entitled "Assessment of knowledge and awareness regarding thyroid disorders among Saudi people", demonstrated that 57.32% of respondents had good knowledge about consequences of iodine intake deficiency, whereas 42.68% had poor knowledge about consequences of iodine intake deficiency.

Regarding the first study question which stated, what is the level of pregnant women's awareness towards importance of iodine intake during pregnancy? The present study revealed that most of the studied pregnant women had poor total awareness score regarding iodine intake during pregnancy. This results in harmony with study performed by *Elebrashy, et al., (2019)* entitled "Assessment of thyroid functions and thyroid volume in normal pregnant Egyptian females" reported that the majority of the studied pregnant women had poor awareness about iodine intake during pregnancy. **In the researcher point of view** this may be due to educational level and nature of study sample that most of women from rural area and this might be an indicator that the studied women didn't get the necessary nutritional information as well as the absence of follow up during pregnancy. On the other hand, the result of the present study inconsistent with finding proved by *Huang, et al., (2020)* aimed to assess Iodine nutritional status of pregnant women in an urban area of northern Taiwan, found that the majority of the studied pregnant women had good awareness about iodine intake during pregnancy

Regarding attitudes of the studied pregnant women about importance of iodine intake during pregnancy, the present study illustrated that slightly less than two thirds of the studied pregnant women disagree regarding the items of Iodine is an essential and necessary element for thyroid gland and the growth of the fetus, Complications of iodine deficiency include

difficulty breathing, weight gain, difficulty concentration and miscarriage for the pregnant women, There is relationship between iodine deficiency and cretinism, and Eating enough iodized salt and iodine rich food helps prevent thyroid problems respectively. This result in the same line with a study performed by [3] aimed to assess Maternal and neonatal outcomes and determinants of iodine deficiency in third trimester of pregnancy in an iodine sufficient area in Africa and reported that most of the studied pregnant women disagree regarding the items of Iodine is an essential and necessary element for thyroid gland and the growth of the fetus, Complications of iodine deficiency.

Also the result of the present study agreed with [18] they found that only 23 % of pregnant women had positive attitude about fetus and mother complication from iodine deficiency during pregnancy. On the other hand the result of the present study disagreed with *Wang, et al., (2019)* performed a study on Iodine deficiency in Zhejiang pregnant women in the context of universal salt iodization program found that more than half of pregnant women had positive attitude about fetus and mother complication from iodine deficiency during pregnancy **In the researcher point of view** that the poor awareness of the studied women directly reflect on the attitude of the studied women. Moreover, the result of the present study inconstant with a study performed by *Censi, et al., (2019)* aimed to assess the effects of iodine supplementation in pregnancy on iodine status in a mild-to-moderate iodine deficiency area, mainly from Eastern Europe found that only 20% of the studied women disagree regarding the items of Iodine is an essential and necessary element for thyroid gland and the growth of the fetus, Complications of iodine deficiency.

Also, more than one half of the studied pregnant women in the current study recorded disagree answer regarding the items of Iodine deficiency is the cause of goiter, Iodine deficiency limit the thyroid gland ability to produce thyroid hormones, Iodine intake is important to prevent disease during pregnancy, Iodine deficiency is treatable problem and Iodine deficiency is easily preventable respectively. This result agreed with a study performed by *Huang, et al., (2020)* about Iodine nutritional status of pregnant women in an urban area of northern Taiwan found that the majority of the studied pregnant women recorded disagree answer regarding all items about Iodine deficiency and the consequences of Iodine deficiency. Also, agreed with a study performed by *Bouga, et al., (2018)* entiled "Contemporary challenges to iodine status and nutrition: the role of foods, dietary recommendation, fortification and supplementation, United Kingdom (UK)" Showed that one fifth of the studied pregnant women recorded agree answer regarding the importance of iodine during pregnancy, all items about Iodine deficiency and the consequences of Iodine deficiency **In the researcher point of view** this negative attitudes related to low educational level, unavailable educational healthcare program. There is a need to improve pregnant women's awareness of iodine nutrition, especially regarding the

National Health and Medical Research Council's daily iodine recommendation for pregnant women.

Regarding the second study question which stated what is the level of pregnant women's attitude towards importance of iodine intake during pregnancy? The current study illustrated that, slightly less than two thirds of the studied pregnant women had negative attitude regarding importance iodine intake during pregnancy. This result in the same line with study performed by **Khamsingnork et al., (2016)** which aimed to assess knowledge, attitude and practice regarding iodine intake among pregnant women at Srinagarind Hospital, in Thailand showed that only 35.26% of studied Pregnant Women had positive attitude regarding iodine intake **From the researcher point of view**, may be related to low educational level, unavailable educational healthcare program. On the other hand this result inconstant with study performed by **Xiao, et al., (2018)** that aimed to assess the effect of iodine nutrition on pregnancy outcomes in an iodine-sufficient area in China reported that more than half of studied Pregnant Women had positive attitude regarding iodine intake **From the researcher point of view**, may be related to the good level of antenatal educational healthcare program in this area about iodine intake.

Regarding the third study question which stated, is there correlation between pregnant women's awareness and attitude towards importance of iodine intake during pregnancy? The current study illustrates that, there was a highly Positive correlation between total awareness, and total attitude scores among studied pregnant women regarding importance of iodine intake during pregnancy. This finding agreed with study performed by **Khamsingnork et al., (2016)** aimed to assess knowledge, attitude and practice regarding iodine intake among pregnant women at Srinagarind Hospital, in Thailand which proved that there was a highly Positive correlation between total knowledge, and total attitude scores regarding iodine intake among pregnant women. Also, this finding agreed with study performed by **Zerfu, et al., (2018)** which aimed to assess knowledge and attitude of pregnant women towards nutritional recommendations in rural Ethiopia who reported that there was a positive correlation between total knowledge and total attitude scores among studied pregnant women toward iodine intake.. **In the point of the researcher view** This might due to poor awareness of pregnant women towards importance of iodine intake lead to poor attitude so if there more pregnant women's awareness towards importance of iodine intake during pregnancy lead to more positive attitude regarding importance of iodine intake during pregnancy. So this could mean that awareness could contribute to positive attitude chance

Significantly, our study proved that are highly statistical significance between total level of awareness and total attitudes of the pregnant women about the importance of iodine intake during pregnancy. The researcher returns the study findings to the poor awareness of the studied pregnant women which directly reflect on the attitude of the studied pregnant women. Finally, the above mentioned findings answered the

research questions and according to the previously findings, the provision of information about the importance of iodine intake for the women during pregnancy was of great importance for pregnant women, so that educational health programs about the importance of iodine intake during pregnancy should be provided for obstetrical and gynecological nurses and there is need to improve antenatal educational health programs for the women during pregnancy to enhance awareness and attitudes of the pregnant women during pregnancy.

5. Conclusion

Based on the results of the present study and research questions, the study concluded that; Less than three quarters of the studied women had poor awareness regarding the importance of iodine intake during pregnancy. Most of the studied women had negative attitude regarding the importance of iodine intake during pregnancy. There was no a statistically significance relation between the total awareness score of the studied women and age, residence as well as monthly income. There was highly statistically significance relation between the total awareness score of the studied women and educational level, and occupation. Also, There was a highly statistically significance relation between the total attitude score of the studied women and educational level as well as occupation. However there was no a statistically significance relation between the total attitude score of the studied women and age, residence as well as monthly income. Moreover, there was highly statistically significance correlation between the total awareness score of the studied pregnant women and total attitude score. The above mentioned findings answered the study questions and the aim was achieved.

6. Recommendations

In the light of the present study findings the following recommendations were suggested:

- [1] An intensive awareness program should be developed and implemented for pregnant women to promote iodine intake during pregnancy
- [2] Implementation of guidelines for modification of life style of pregnant women regarding dietary iodine intake.
- [3] Regular periodic screening for all pregnant women for early detection of iodine deficiency disorders and providing management.
- [4] Booklets and posters should be available and distributed in obstetrics and gynecological outpatient clinic at Benha university hospital to increase awareness of pregnant women about the importance of iodine intake during pregnancy and hazards of low and excessive iodine intake and methods of prevention.

Recommendations for further researches:

- Further researches are needed to study the effect of IDD on health of pregnant women and her fetus.
- Further studies should be applied on a larger sample of pregnant women for generalization of results.

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