

***Nutritional Assessment of Hypothyroidism out Patient
Sample from Urban and Rural Regions in Egypt***

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Abstract

This Study was undertaken to evaluate nutritional status, dietary intake from iron, selenium, zinc, iodine and vitamin C in patients with hypothyroidism disease. A random sample of 40 hypothyroidism patients (5 male and 35 female) were selected from Kasr El-Aini Hospital out patients with age from (30-45) years. Three tools were used for data collection, structured interview questionnaire, dietary assessment questionnaire and nutritional intake, knowledge and food habits questionnaire. Anthropometric measurements were performed at baseline. Assessments of nutritional status were depended on dietary adequacy degree, was performed by using 24 hour dietary recall, food frequency of selected food items and nutritional knowledge about some food habits. Results at baseline revealed that 100% of patients were suffering from obesity and malnutrition combined with poor food habits. The current study recommended that nutrition education program intervention strives to make patients aware of healthier food option at their local food.

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Introduction

Thyroid gland disease is a public health problem worldwide westernization and nutrition transitions in Arab world have increased the burden of adenocarcinomas including thyroid cancer (***Al Shahrani et al., 2016***). Different thyroid diseases were reported in different studies that include hypothyroid, hyperthyroid and goiter. The prevalence of different types of thyroid disease varied between the studies. The study conducted in 2011 in Libya reported the prevalence of subclinical hypothyroidism as 2.3 % (***Ghawilet et al., 2011***) and prevalence of hyperthyroidism was reported as 6.18% in Libya (***Nouchet et al., 2008***) and 47.43% in Saudi Arabia- Makkah region (***Lamfon, 2008***). The prevalence of goiter was reported by many studies conducted in Egypt, Algeria and Bahrain (25.2, 4.86 and 1.7%) respectively (***El-Mougiet et al., 2004; Henjumet et al., 2010; Moosa et al., 2000***). In Egypt use of the most recent endocrine society clinical practice guidelines led to miss detection clinical or subclinical hypothyroidism in 34.5% of pregnant women (***Ahmed et al., 2014***). Normal thyroid status is depended on the presence of many trace elements for both the synthesis and metabolism of thyroid hormones (***Nazifiet et al., 2003***). Thyroid hormones influence the level of essential trace elements in the serum and urine are also associated with the oxidative and antioxidative status in the human body (***Al-Sayer et al., 2004***).

Subjects and Methods

Subjects :

A random sample of 40 hypothyroidism patients (5 male and 35 female), were selected from Kasr El-Aini Hospital, endocrinology clinic. Out patients with age ranging from (30-45) years. Thyroid enlargement defined as thyroid volume > 1.8ml in women, 2.5 ml in

men. The thyroid nodules recorded if > 10Mm sonar performed by the same operator .

Criteria for Subject Selection :

Subjects who were not under medical treatment and didn't have previous thyroid surgery or radio- iodine treatment were included.

Exclusion Criteria for subjects are as follows :

Recent radio therapy or recent thyroid scan, renal failure and hepatic patients.

A-Anthropometric Assessments

Weight, height and body mass index according to **Mitch and Klahr, (1993)**, as the weight (kg)/ height (m²). The prevalence of overweight or obesity was determined .

B-Dietary Assessments:

1-Dietary Recall Methodology :

A structured seven-pass 24 h dietary recall was used to record all foods and beverage intakes on the day before each interview from midnight to midnight. portion sizes were estimated using standardized measuring guides including cups, spoons, rulers, measuring sticks, different sized shapes and containers, and photos of selected food items. Quality controls which improved the reliability and validity of the dietary recall included a standardized protocol that specified exact techniques for interviewing, recording and calculating results; standardized graduated food models for quantification of foods and beverages consumed, a product identification notebook for probing of snack consumption; preparation methods, and average portion sizes of menu items reflected in each 24-hour recall. Data were collected between September and February 2020- 2021. Dietary data were transplanted into nutrient intake data using a specifically designed nutrient data base The Egyptian Food Composition Tables and Nutrient Data of National Institute (***Food Composition Tables for Egypt, 1996***).

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The data were converted into weights and combined data energy and nutrients of 24 hours were computed through the food composition tables of National Institute (***Food composition Tables for Egypt, 2006***). The nutritional value of food and beverage consumed were compared to the recommended dietary allowance (RDAs) of WHO, FAO/UNU) were consider as cut off points micronutrients. Distribution of the nutrients intake from energy, protein, some minerals and some vitamins depending on their dietary adequacy degree, whereas (Unsafe level of consumption "less than 50%", unaccepted level of consumption "50 %< 75%", accepted level of consumption "75% <100%", adequate level of consumption "100 %< 125%" and overconsumption "more than 125")

C-Statistical Analysis:

Statistical analysis was carried out using SPSS statistical software version 20(***SAS, 2004***).

Results and Discussion

Relation between Socio-demographic Characteristics and Hypothyroidism Prevalence among Male and Female Patients:

Table (1) illustrate that the sample number of cases under 30 years, were represented 15% of the total sample size, while age group $\leq 30-40$ years and > 40 years reached 42.5% for each group. Results of this study revealed that the age group $\leq 30-40$ and > 40 represented 85% of the total sample .Meanwhile the gender, results revealed that female patients were represented 87.5% of the total sample, while male reached 12.5% .Alsoour results revealed that 65% of the sample size were from rural areas, while 35% from urban areas .

Concerning the educational level of the patients table (1) illustrate that 62.5% of sample size were illiterate, while 27.5% in prep and secondary school level, while only 10% were at university degree .

Results also revealed that 85% of the sample size was at income level \leq 3000-5000 L.E, while 10% at income level $>$ 5000 L.E, Meanwhile 5% only were at income level 3000 L.E .

Results of this study are at the same line with **(Budlewski and Franek, 2009)** who reported that the prevalence and pattern of thyroid disorder depend on ethnic and geographical factors. In this respect **(Divi, et al., 1997)** demonstrated that in both sexes the prevalence of hypothyroidism increase with age, and it's about 5 times more in women than men.

Relationship between some Anthropometric Measurements and Hypothyroidism Disease:

Table (2) shows the relationship between some anthropometric measurements weight, height, body mass index (BMI), mid upper arm (MUA) and neck circumference (NC) of male and female patients. Results revealed that BMI for male and female patients recorded (30.46 ± 5.74 and 32.14 ± 5.67 kg/m²) respectively. While mid upper arm (MUA) for male and female hypothyroidism patients recorded (34.8 ± 6.53 and 34.74 ± 5.15 cm) respectively, meanwhile the neck circumference reached (39.8 ± 7.09 and 39.63 ± 5.25) respectively. Statistically result of this study revealed a significant ($P < 0.05$) prevalence of obesity without non significant difference between gender, age, residence, education and income level. In this concern **(Porkodiet al., 2004)** cleared that abnormal or changing thyroid status may precipitate or exacerbate musculoskeletal disease, especially when common features and symptoms for hypothyroidism such as fatigue, malaise, dyslipidemia and increased weight .

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In this respect (*Pierychet al., 2011*) demonstrated that hypothyroidism is usually associated with weight gain and reduction of thermogenesis and metabolism .

Evaluation of Nutritional Awareness Level Between Hypothyroidism Patients at Baseline.

Table (3) illustrates the level of nutritional awareness between male and female hypothyroidism patients at baseline. Results revealed that nutritional awareness as score of knowledge about health benefit of essential nutrients, for male and female hypothyroidism patients were recorded as poor level for (100% and 94.30%) respectively while 5.70% of female recorded as fair level . Concerning score of food habits enchaining and hindering of some minerals absorption enhancing, results revealed that male and female patients recorded (60% and 85.71%) respectively as poor (NKS), while (40% and 14.29%) recorded as fair degree.

Concerning (N K S) of male and female patients about sources of foods rich in iron. Results revealed that (80% and 88.57%) recorded as poor while (20 % and 11.48%) as fair, meanwhile nutrition knowledge score about the sources of iodine , zinc and selenium for male and female recorded as (100% and 100%) scored as poor level.

Relationship between Educational Level of Hypothyroidism Patients and Degree of Dietary Adequacy from some Nutrients at Baseline.

The relationship between the educational level of hypothyroidism patients and the degree of dietary adequacy from total calories, protein iodine, zinc, selenium, iron and vitamin C at baseline presented in tables (4,5,6,7,8, and 9).

Results presented in table (1) revealed that according to the random sample of hypothyroidism patients, it consists of (25) illiterate patients (2 males and 23 females) while (11) patients (1 male and 10 female) were at secondary level, while only (4) patients (2 males and 2 females) completed their university degree.

Concerning the dietary adequacy intake of calories. Results revealed in table (4) that the illiterate male and female patients recorded (100% vs. 34.98%) in the accepted level of calories intake, while 47.6 and 17.39% of female respectively were in the adequate and over consumption level. Meanwhile male and female at secondary level recorded (100% and 50%) respectively in the accepted level. While (50%) of female were in the adequate level, Male and female at university education level recorded (50% and 50%) in adequate level, while (50% and 50%) were in over consumption level. Our results revealed that all patients recorded accepted level of calories intake without significant difference ($p < 0.05$) between the educational level of patients.

Results presented in Table (5) illustrate the relationship between educational level of male and female patient and dietary adequacy from protein at baseline. Results revealed that (50% vs. 78.26%) respectively in the unsafe level of dietary adequacy from protein consumption while (50% vs. 13.04%) in the unaccepted level of consumption, meanwhile (8.69%) of female recorded in accepted level of consumption. While concerning male and female in secondary level recorded (100% vs. 100%) in the unaccepted level of dietary adequacy of protein consumption. Regarding to male and female of university degree results recorded that (50% vs. 50%) the unsafe level of consumption, while (50% vs. 50%) were at the unaccepted level of consumption .

Concerning the dietary adequacy intake from iodine by illiterate male and female patients at baseline. Table (6) illustrate

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results which recorded that (50 Vs 34.78%) respectively were in unsafe level and (50% Vs 65.22%) were in unaccepted level of consumption, while secondary level recorded (100% Vs 40%) respectively in unaccepted level of consumption, While 60% female in unsafe level of iodine consumption meanwhile, male Vs female at university degree recorded (50% Vs 50% and 50% Vs 50%) respectively in unsafe and un accepted of consumption .While 50% of female in unsafe level of iodine consumption .In this concern (**EL Aziz et al., 2013**) identified low iodine status in 80 non pregnant Egyptian women with thyroid nodes despite their use of iodized salt.

Table (7) illustrate the relationship between educational level and the dietary adequacy intake from zinc at baseline by illiterate male Vs female which recorded (100% vs. 43.48%) respectively in unaccepted level, while (43.48%) of female were in unsafe level of zinc consumption. Meanwhile secondary level of male and female patients recorded (100 vs. 20%) in unaccepted level while (80%) of female recorded at unsafe level of consumption. The male and female at university level recorded (50% vs. 100%) in unsafe level, while the other 50% of patients were in unaccepted level of zinc consumption .

In this respect (**Maxwell and Volpe .,2017**) cleared that zinc is an essential element for the proper synthesis and metabolism of thyroid hormones .Occurrence of zinc deficiency can reduce thyroid activity and resting metabolic rate .

In this concern results presented in table (8) illustrate the relationship between educational level of male and female hypothyroidism patients and dietary adequacy intake from selenium. Results revealed that (100% and 56.52%) in unsafe level of consumption, while 43.48% in unaccepted level of consumption,

meanwhile secondary level of male and female recorded (100% and 80%) in unsafe level, while 20% of female at unaccepted level. Concerning university level of male and female respectively recorded (50% Vs 50%) and (50% Vs 50%) in unsafe and unaccepted level of consumption . Results revealed se deficiency between male and female hypothyroidism patients. In this concern (**Milner, 2007**) started that the proper balance of T3 and T4 is dependent on adequate selenium. Conversion depends on the selenium dependent enzyme 5´deiodinase. Considerable selenium deficiency disturb the metabolism of thyroid hormones by inhibiting the synthesis and activity of deiodinase iodothyronine which is responsible for conversion of thyroxin into more active metabolically forms (**Corvilainet al ., 1993**).

Results presented in table (9) illustrate the relationship between educational level of male and female hypothyroidism patients and dietary adequacy from iron. Results revealed that illiterate male Vs Female patients recorded (50% Vs 52.17%) in unsafe level of iron consumption, while (50% Vs 47.83%) in unaccepted level of consumption. Concerning male and female patients at secondary level of education results recorded that (100% vs 50%) were in unsafe level, while the other 50% of female patients were at unaccepted level of consumption. Concerning university degree of male and female patients results revealed that (50% Vs 50%) were in unsafe level while (50% Vs 50%) in the unaccepted level of consumption.

Results of this study revealed that all patients with different levels of education suffering from iron deficiency without significant difference between all levels of education degree. In this respect (**Mousaet al., 2016**) reported that in study on 912 girls in different village in El-Minya government at Upper Egypt were enrolled in the study (39.9%) of studied girls were anemic, the prevalence of iron deficiency anemia was 30.2% and iron deficiency without anemia

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was 11.4%. Iron deficiency impairs thyroid hormone synthesis by reducing the activity of heme (*Zimmermann and Kohrle, 2002*). One of the key enzymes, called thyroid iodine peroxidase, which contains iron in its molecule, is necessary for thyroid function.

Results presented in table (10) illustrate the dietary adequacy from vitamin C between hypothyroidism patients. Results revealed that illiterate male and female patients were recorded (100% and 60.87%) in unsafe level of dietary adequacy intake from vitamin C. Meanwhile illiterate female patients recorded (39.13%) in an unaccepted level of consumption. Concerning secondary level, male recorded (100%) in unsafe level, while female recorded (50% and 50%) in unsafe and unaccepted level. Meanwhile male and female university level recorded (100% and 50%) in unsafe while the other 50% of female recorded 50% in unaccepted level of vitamin C dietary adequacy. Results of this study revealed a non-significant relationship between educational level and adequacy of vitamin C intake. In this respect (*Hedberg, 2009*) clarified that vitamin C is an iodine transporter and protects against free radical damage caused by stress.

Conclusion

Results of this study revealed that male and female hypothyroidism patients from different levels of education, residence, income, were had poor nutrition knowledge score and suffering from numerous nutritional deficiencies of such elements protein, iron, iodine, zinc, selenium and vitamin C. We suggest that presence of numerous nutritional deficiencies in patient's body can be the cause of thyroid disorder. In the light of the study results, it can be concluded that comprehensive nutrition education program intervention strives to make patients aware of healthier food options at their local food.

Table (1): Relation between Socio-demographic Characteristics and Hypothyroidism Prevalence among Male and Female Patients

Sociodemographic characteristic	Male (n=5)		Female (n=35)		Total (n=40)		P Value
	No	%	No	%	No	%	
Age group							
<30	1	20	5	14.29	6	15	0.821
≤30-40	2	40	15	42.86	17	42.5	
>40	2	40	15	42.86	17	42.5	
Total	5	12.5	35	87.5	40	100	
Residence							
Rural	3	60	23	65.71	26	65	0.803
Urban	2	40	12	34.29	14	35	
Total	5	12.5	35	87.5	40	100	
Educational Level							
Illiterate	2	40	23	65.71	25	62.5	0.434
Prep and Secondary	1	20	10	28.57	11	27.5	
University Degree	2	40	2	5.71	4	10	
Total	5	12.5	35	87.5	40	100	
Income Level							
< 3000 L.E	0	0	2	5.71	2	5	0.296
≤3000-5000 L.E	4	80	30	85.71	34	85	
>5000 L.E	1	20	3	8.57	4	10	
Total	5	12.5	35	87.5	40	100	

P value with no star not significantly different* P value Significant at ≤0.05** P value Highly Significant at ≤ 0.01

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Table (2): Relationship between some Anthropometric Measurements and Hypothyroidism Disease

Assessment Parameters	Weight (Kg)	P-value	Height (Cm)	P-value	Body Mass Index (BMI) (kg/m ²)	P-value	Mid Upper Arm (MUA)(Cm)	P-value	Neck circumference (Cm)	P-value
Gender										
Male	79.00±19.22	0.89	160.40±4.561	0.413	30.46±5.74	0.558	34.8±6.53	0.982	39.80±7.09	0.948
Female	80.07±15.88		158.31±5.35		32.14±5.67		34.74±5.15		39.63±5.25	
Age										
< 30	87.00±18.93	0.626	159.89±7.753	0.623	33.79±6.28	0.709	35.67±6.87	0.892	39.67±5.36	0.553
≤30-40	74.94±10.94		158.13±4.631		30.42±4.89		34.0±4.98		39.813±5.84	
> 40	81.03±17.98		158.27±4.234		32.42±5.930		35.00±4.68		39.47±5.32	
Residence										
Urban	78.79±14.96	0.744	158.43±4.52	0.496	31.20±5.39	0.557	35.357±5.76	0.598	40±7.26	0.768
Rural	80.56±16.28		158.65±5.505		32.318±5.61		34.42±4.81		39.46±3.91	
Educational Level										
Illiterate	81.08±15.05	0.935	159.42±4.167	0.762	32.17±5.20	0.849	35.83±6.37	0.519	40.75±7.92	0.709
Prep and Secondary	81±17.82		154.2±4.27		33.23±7.27		32.6±4.93		39±5.15	
University Degree	79.11±16.86		159.09±5.64		31.52±5.70		34.65±4.73		39.22±3.823	
Income Level										
< 3000 L.E	78±32.53	0.922	162.5±10.61	0.273	28.19±9.49	0.755	34.75±4.66	0.558	39.5±3.32	0.96
≤3000-5000 L.E	79.69±16.03		158.35±5.27		31.93±5.60		34.56±5.26		39.62±5.62	
>5000 L.E	83±12.49		158.5±1.915		33.76±4.84		38±8.49		40.5±7.78	

P-value without star is not significantly different, (*) P value Significant at ≤0.05, (**)

P value Highly Significant at ≤ 0.01

Table (3): Evaluation of Nutritional Awareness Level between Hypothyroidism Patients

Score of Knowledge	Male		Female		Total	
	N	%	N	%	N	%
Health Benefit of Essential Nutrients Awareness level of Hypothyroidism Patients about the health						
Poor	5	100.00	33	94.30	38	95.00
Fair	0	0.00	2	5.70	2	5.00
Good	0	0.00	0	0.00	0	0.00
Total	5	100.00	35	100.00	40	100.00
Food Habits Enchainning and Hindering some Minerals Absorption Enhancing						
Poor	3	60.00	30	85.71	29	72.50
Fair	2	40.00	5	14.29	10	25.00
Good	0	0.00	0	0.00	1	2.50
Total	5	100.00	35	100.00	40	100.00
Sources of Foods Rich in Iron						
Poor	4	80.00	31	88.57	35	87.50
Fair	1	20.00	4	11.48	5	12.50
Good	0	0.00	0	0.00	0	0.00
Total	5	100.00	35	100.00	40	100.00
Sources of Foods Rich in Iodine						
Poor	5	100.00	35	100.00	40	100.00
Fair	0	0.00	0	0.00	0	0.00
Good	0	0.00	0	0.00	0	0.00
Total	5	100.00	35	100.00	40	100.00
Sources of Foods Rich in Zinc						
Poor	5	100.00	35	100.00	40	100.00
Fair	0	0.00	0	0.00	0	0.00
Good	0	0.00	0	0.00	0	0.00
Total	5	100.00	35	100.00	40	100.00
Sources of Foods Rich in Selenium						
Poor	5	100.00	35	100.00	40	100.00
Fair	0	0.00	0	0.00	0	0.00
Good	0	0.00	0	0.00	0	0.00
Total	5	100.00	35	100.00	40	100.00

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Table (4): Relationship between Educational Level of Hypothyroidism patients and Dietary Adequacy Intake from Total Calorie by Hypothyroidism Patients at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	0	0.0	0	0.0	0	0.0	--
Unaccepted level of consumption (50 %< 75%)	0	0.0	1	4.35	1	4	--
Accepted level of consumption (75 %< 100%)	2	100	8	34.98	10	40	0.532
Adequate level of consumption (100 %< 125%)	0	0.0	10	43.48	10	40	-
Over consumption (more than 125%)	0	0.0	4	17.39	4	16	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	0	0.0	0	0.0	0	0.0	--
Unaccepted level of consumption (50 %< 75%)	0	0.0	0	0.0	0	0.0	--
Accepted level of consumption (75 %< 100%)	1	100	5	50	6	54.55	0.05*
Adequate level of consumption (100 %< 125%)	0	0.0	5	50	5	45.45	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	0	0.0	0	0.0	0	0.0	--
Unaccepted level of consumption (50 %< 75%)	0	0.0	0	0.0	0	0.0	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	1	50	1	50	2	50	--
Over consumption (more than 125%)	1	50	1	50	2	50	0.05*

P-value without star is not significantly different, (*) P value Significant at ≤ 0.05 , (**) P value Highly Significant at ≤ 0.01

Table (5): Relationship between Educational Level of Hypothyroidism Patients and Dietary Adequacy Intake from Protein at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	1	50	18	78.26	19	76	0.044*
Unaccepted level of consumption (50 %< 75%)	1	50	3	13.04	4	16	0.05*
Accepted level of consumption (75 %< 100%)	0	0.0	2	8.69	2	8	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	0	0.0	0	0.0	0	0.0	--
Unaccepted level of consumption (50 %< 75%)	1	100	10	100	11	100	0.015*
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	1	50	1	50	2	50	0.401
Unaccepted level of consumption (50 %< 75%)	1	50	1	50	2	50	0.423
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different⁽¹⁾ P value Significant at ≤ 0.05 , ^(**) P value Highly Significant at ≤ 0.01

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Table (6): Relationship between Educational Level of Hypothyroidism Patients and Dietary Adequacy from Iodine at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	1	50	8	34.48	9	36	0.05*
Unaccepted level of consumption (50 %< 75%)	1	50	15	65.22	16	64	0.0514*3
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	0	0.0	6	60	6	54.55	--
Unaccepted level of consumption (50 %< 75%)	1	100	4	40	5	45.45	0.01**00
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	1	50	1	50	2	50	0.524
Unaccepted level of consumption (50 %< 75%)	1	50	1	50	2	50	0.854
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different⁽¹⁾ P value Significant at ≤ 0.05 , ⁽²⁾ P value Highly Significant at ≤ 0.01

Table (7): Relationship between Education Level of Hypothyroidism Patients and Dietary Adequacy Intake from Zinc at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	0	0.0	10	43.48	10	40	--
Unaccepted level of consumption (50 %< 75%)	2	100	10	43.48	12	48	0.04*
Accepted level of consumption (75 %< 100%)	0	0.0	3	13.04	3	12	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	0	0.0	8	80	8	72.73	--
Unaccepted level of consumption (50 %< 75%)	1	100	2	20	3	27.27	0.05*
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	1	50	2	100	3	75	0.342
Unaccepted level of consumption (50 %< 75%)	1	50	0	00.0	1	25	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different⁽¹⁾ P value Significant at ≤ 0.05 , ^(**) P value Highly Significant at ≤ 0.01

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Table (8): Relationship between Educational Level of Hypothyroidism Patients and Dietary Adequacy Intake from Selenium at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	2	100	13	56.52	15	60	0.01**
Unaccepted level of consumption (50 %< 75%)	0	0.0	10	43.48	10	40	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	1	100	8	80	9	81.82	0.14
Unaccepted level of consumption (50 %< 75%)	0	0.0	2	20	2	18.18	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	1	50	1	50	2	50	0.31
Unaccepted level of consumption (50 %< 75%)	1	50	1	50	2	50	0.53
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different^(*) P value Significant at ≤ 0.05 , ^(**) P value Highly Significant at ≤ 0.01

Table (9): Relationship between Educational Level of Hypothyroidism Patients and Dietary Adequacy Intake from Iron at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	1	50	12	52.17	13	52	0.01**
Unaccepted level of consumption (50 %< 75%)	1	50	11	47.83	12	48	0.02*
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	1	100	5	50	6	54.55	0.12
Unaccepted level of consumption (50 %< 75%)	0	0.0	5	50	5	45.45	0.2
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	1	50	1	50	2	50	0.23
Unaccepted level of consumption (50 %< 75%)	1	50	1	50	2	50	0.52
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different⁽¹⁾ P value Significant at ≤ 0.05 , ^(*) P value Highly Significant at ≤ 0.01

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Table (10): Relationship between Educational Level of Hypothyroidism Patients and Their Dietary Adequacy Intake from Vitamin C at Baseline

Adequacy Degree	Male		Female		Total		P value
	N	%	N	%	N	%	
Illiterate							
Unsafe level of consumption (less than 50%)	2	100	14	60.87	16	64	0.01**
Unaccepted level of consumption (50 %< 75%)	0	0.0	9	39.13	9	36	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
Secondary Degree							
Unsafe level of consumption (less than 50%)	0	0.0	5	50.0	5	45.45	--
Unaccepted level of consumption (50 %< 75%)	1	100	5	50	6	54.55	0.112
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--
University Degree							
Unsafe level of consumption (less than 50%)	2	100	1	50	3	75	0.223
Unaccepted level of consumption (50 %< 75%)	0	0.0	1	50	1	25	--
Accepted level of consumption (75 %< 100%)	0	0.0	0	0.0	0	0.0	--
Adequate level of consumption (100 %< 125%)	0	0.0	0	0.0	0	0.0	--
Over consumption (more than 125%)	0	0.0	0	0.0	0	0.0	--

P-value without star is not significantly different^(*) P value Significant at ≤ 0.05 , ^(**) P value Highly Significant at ≤ 0.01

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تقييم الحالة الغذائية للمرضى المصابين بنقص افراز هرمون الثيروكسين-
عينة من الحضر و الريف في مصر

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الملخص العربى

أجريت هذه الدراسة لتقييم الحالة الغذائية ولمعرفة المأخوذ من الحديد والسلينيوم والزنك وفيتامين ج فى المرضى المصابين بنقص افرازهرمون الغدة الدرقية. وقد شملت الدراسة عينة عشوائية من 40 مريض (5 ذكورو 35 اناث) مصابين بنقص افرازهرمون الغدة الدرقية تم تشخيصهم واختيارهم من العيادة الخارجية بمستشفى القصرالعينى تتراوح أعمارهم ما بين (30 - 45عام). وقد تم اعداد الاستبيانات الخاصة مسبقا لنتمكن من تقييمها لحالة الغذائية باستخدام استمارات استرجاع 24 ساعة واستمارة التاريخ الغذائى كذلك استمارة التعرف على العادات الغذائية والنمط الغذائى لافراد العينة بجانب استمارات تقييم المقاييس الجسمية وذلك عند بدأ التجربة. وقد أظهرت نتائج هذه الدراسة ان 100% من المرضى يعانون من السمنة وسوء التغذية. وكذلك تبين عدم كفاية المأخوذ من البروتين والحديد والسلينيوم واليود والزنك وفيتامين ج بجانب زيادة المأخوذ من الطاقة. كما تبين أيضا ان جميع المرضى من المستويات التعليمية المختلفة ليس لديهم وعى غذائى ولديهم بعض العادات الغذائية الخاطئة. وتوصى هذه الدراسة بضرورة التدخل ببرنامج للتثقيف التغذوى كى نتمكن من إمداد المرضى بالتنوعية الغذائية وبكيفية إختيارالغذاء الصحى المتاح فى اطعمتهم المحلية.