AlQalam
Alq J Med App Sci
https://journal.utripoli.edu.ly/index.php/Alqalam/index eISSN 2707-7179

Original article

Assessment of Dietary Patterns in Thyroid Patients in Zawia City, Libya

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ARTICLE INFO

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Received: *12-09-2024*
Accepted: *09-11-2024*
Published: *17-11-2024*

Keywords. *Diet, Thyroid, Dysfunction, BMI, Obesity.*

ABSTRACT

Hormonal abnormalities, especially those related to follicle-stimulating hormone (FSH). This study seeks to examine the relationships of BMI, dietary patterns, seafood intake, FSH levels, and genetic variables in patients with thyroid conditions. This cross-sectional study encompassed 94 patients with thyroid conditions. BMI was categorized into four classifications (<17, 17–19, 20–25, >25), and dietary patterns were divided into conventional, balanced, specific diets, and others. Seafood consumption was classified as daily, weekly, seldom, infrequently, or never. FSH levels were categorized into five ranges. Statistical analysis was conducted to evaluate the correlations among these characteristics. A significant correlation was seen between BMI and FSH levels (p = 0.000041), with people exhibiting a BMI <17 demonstrating elevated FSH levels (>15 in 10 participants). Individuals with a BMI exceeding 25 demonstrated reduced FSH levels (ranging from 1 to less than 5 in 18 subjects). Seafood consumption significantly influenced FSH levels (p = 0.002334), with weekly consumers exhibiting a wide range of FSH values, whereas infrequent or non-consumers demonstrated elevated FSH levels (>15 in 5 subjects). Concerning dietary patterns, 60.63% adhered to a conventional diet, whereas 67% of patients have a familial history of thyroid disorders. Furthermore, 48.2% of subjects had second-degree obesity. This study highlights the intricate relationship among BMI, dietary habits, seafood intake, and hormonal regulation in patients with thyroid conditions. These factors, in conjunction with genetic predispositions, must be taken into account in the management of thyroid problems to enhance patient outcomes.

Cite this article. *Elzawi A, Beshna N, Alahrash G, Alafia S, Alearf A. Assessment of Dietary Patterns in Thyroid Patients in Zawia City, Libya. Alq J Med App Sci. 2024;7(4):1238-1248.* https://doi.org/10.54361/ajmas.247448

INTRODUCTION

The thyroid gland is a vital endocrine organ in the human body, responsible for regulating several physiological functions through the persistent secretion of thyroid hormones into the bloodstream. This gland is crucial for metabolism, growth, and development [1]. Thyroid disorder, encompassing both hypothyroidism and hyperthyroidism, profoundly affects the body's metabolic functions. Hypothyroidism, marked by reduced thyroid hormone synthesis, leads to a deceleration of metabolic activities. This is evident in several metabolic disorders, characterized by increased total cholesterol (TC), low-density lipoprotein (LDL), and triglycerides (TG), alongside abnormally diminished levels of high-density lipoprotein (HDL) [2]. Hyperthyroidism is characterized by an overproduction of thyroid hormone. This syndrome accelerates the metabolic rate, resulting in symptoms such as hyperglycemia, increased hepatic glucose turnover, and hyperinsulinemia [3].

Thyroxine (T4) and triiodothyronine (T3) are two thyroid hormones that play a crucial role in metabolic regulation. These hormones affect the growth, development, and function of the body's organs [4]. Thyroid dysfunction can induce several alterations within the body, impacting various physiological systems. The control of metabolic processes is entirely dependent on thyroid hormones, and any abnormalities in these hormones might result in a disruption of homeostasis [5]. Moreover, thyroid hormones interact with adipocytokines, which are compounds produced by adipocytes that affect metabolism. Thyroid hormones are essential for maintaining metabolic and energy balance, including the regulation of body weight, thermogenesis, and lipolysis [6].

Dietary practices can affect aberrant thyroid function. Malnutrition is known to produce changes in thyroid hormone levels. A decreasing serum T3 level, commonly noted in famine situations, is associated with reduced peripheral conversion of thyroxine T4 to T3, with recognized decreases in T4 concentrations. Starvation results in a reduction of thyroxine conversion to T3 [7, 8]. Improper eating habits are associated with various health issues, including mental health disorders, cardiovascular diseases, and obesity [9]. An unbalanced diet can significantly impact thyroid function, primarily due to insufficient or excessive intake of particular nutrients. Iodine is crucial for the synthesis of thyroid hormones, and its deficiency may lead to hypothyroidism or goiter [10]. Conversely, excessive iodine intake can disrupt thyroid function and perhaps induce hyperthyroidism or thyroiditis [11,12]. Furthermore, particular dietary patterns may alter the gut flora, which has been suggested to influence thyroid hormone levels and autoimmune responses, thereby jeopardizing thyroid health [13].

Carbohydrates have various functions in human metabolism, and their influence on thyroid function is now being studied. Thyroid hormones act as essential metabolic regulators; hence, changes in these pathways may affect thyroid function. Carbohydrates are vital energy sources required for the synthesis of several biological components [14]. A positive association occurs between BMI and thyroid function, with fluctuations in normal thyroid function among euthyroid individuals associated with alterations in body weight [15]. An elevated BMI correlates with heightened serum TSH and reverse triiodothyronine (rT3) levels [16].

Thyroid function may be influenced by environmental factors such as smoking, alcohol consumption, diet, and exposure to certain chemicals, which might obscure the relationship with body mass index [17]. Changes in thyroid function can lead to weight swings, and there is a substantial correlation between thyroid function and BMI. Obese individuals demonstrate a favorable link with body mass index (BMI), exhibiting increased levels of free triiodothyronine (FT3) and FT3/free thyroxin (FT4) ratios [18]. The diet is crucial for thyroid health, as numerous nutrients influence thyroid function and autoimmune thyroid diseases. Excessive iodine consumption can lead to hypothyroidism and autoimmune reactions, which facilitate the onset of autoimmune thyroid conditions, such Hashimoto's thyroiditis [19]. Nutritional deficiencies, particularly insufficient selenium and iron levels, might influence the onset and progression of thyroid illnesses, such as Hashimoto's thyroiditis [20]. There is increasing acknowledgment that dietary practices may affect the risk of numerous inflammatory and immune-mediated conditions, including autoimmune illnesses, through various processes. The present study suggests that a restricted diet of animal products safeguards against thyroid autoimmunity and positively influences redox balance, perhaps mitigating oxidative stress-related diseases [21]. The objective of this study is to examine the relationship between thyroid function and both macro- and micronutrient consumption.

METHODS

Study Design

This cross-sectional observational study examined the distribution of BMI, food patterns, obesity levels, hereditary thyroid conditions, and hormone levels, including FSH, in individuals diagnosed with thyroid problems. A total of 94 patients were examined during a six-month period for data collection. The study evaluated the influence of nutrition, obesity, and genetic variables on thyroid problems, while also examining the trends in illness prevalence concerning hormone levels and their variations, particularly for FSH. Participants consisted of patients undergoing treatment at the thyroid outpatient department of the designated hospital. Convenience sampling were conducted on patients with stringent adherence to inclusion and exclusion criteria.

Data collection

The data collection included a standardized questionnaire that gathered information on demographics, BMI, dietary practices, and familial history of thyroid disorders. Anthropometric measurements comprised height and weight, utilized to calculate the BMI for each patient, categorized into normal weight, mild thinness, moderate thinness, and obesity classifications. The classifications of obesity were categorized into first-degree obesity, second-degree obesity, and third-degree obesity. Blood samples were collected from participants to evaluate their follicle-stimulating hormone levels utilizing various ELISA techniques. The dietary habits of these individuals were documented and subsequently classified into primary groups such as traditional diet, balanced diet, special diets, and others. The dietary consumption patterns were documented by classifying the foods typically ingested at breakfast, lunch, and supper, along with the frequency of seafood, vegetables, and fruits consumed.

Inclusion and exclusion criteria

We have included patients aged 18 years and older with any diagnosed thyroid disease who provided informed permission were eligible for the trial. They were required to possess accessible health records about BMI, familial history, and FSH hormone levels. Enrollment in this study was restricted to willing participants possessing available data. Patients receiving thyroid care at the outpatient clinic on a regular basis were also included in the study.

Pregnant or breastfeeding individuals were excluded from this study due to significant fluctuations in their hormone levels that could impact FSH values. Individuals with metabolic or autoimmune disorders, excluding thyroid problems, were also excluded, along with those on drugs known to influence FSH levels, such as hormone replacement therapy. Furthermore, patients who had undergone bariatric surgery and those with recent substantial weight loss were excluded to prevent any recent medical interventions from affecting the BMI measurements, were also excluded.

Statistical analysis

Data were entered and analyzed using SPSS, Statistical Software version 25.0. Descriptive statistics were applied in order to summarize participant characteristics, dietary habits, and hormone levels. Frequencies and percentages were calculated for categorical variables. Chi-square and T-test tests were employed to assess associations between dietary habits and thyroid function categories.

RESULTS

Distribution of BMI values among participants

The distribution of body mass index (BMI) across the patients indicates a notable disparity in weight classifications as table 1 indicates. A significant percentage of participants, 30.8%, have a BMI exceeding 25, signifying overweight or obesity. This indicates that around one-third of the population exceeds the healthy weight level. Furthermore, 25.5% of patients are categorized within the BMI range of 20-25, which is typically regarded as a healthy weight. A significant proportion of patients, 24.4%, possess a BMI below 17, signifying underweight status, which may indicate malnutrition or other health issues. Finally, 19.1% of participants fall within the 17-19 BMI range, classified as somewhat underweight.

Table 1. Body mass index (BMI) of the patients.

BMI	Frequency	Percentage
<17	23	24.4%
17-19	18	19.1%
20-25	24	25.5%
>25	29	30.8%
Total	94	100%

Categories of obesity among participants

The analysis of obesity levels within the study group indicates that most obese people are classified as having second-degree obesity, with 48.2% exhibiting a BMI ranging from 35 to 39.9. This signifies a substantial prevalence of severe obesity among the cohort. First-degree obesity, characterized by a BMI below 35, comprises 27.5% of the population, whereas 24.1% of individuals' exhibit third-degree obesity, defined by a BMI beyond 40, signifying extreme obesity, as demonstrated in table 2.

Table 2. Distribution of obesity level among study population.

Obesity level	Frequency	Percentage
First class obesity (<35)	8	27.5%
Second degree obesity (35-39.9)	14	48.2%
Third degree obesity (>40)	7	24.1%
Total	29	100%

Distribution of disease onset among participants and its correlation with BMI

The p-value of 0.011282 suggests a statistically significant correlation between BMI categories and the onset of disease as shown in table 3. Participants who experienced a sudden onset of their condition predominantly had BMIs >25 (10 out of 21 sudden onset cases). Conversely, individuals with BMIs <17 were less likely to experience a sudden onset (2 out of 23 cases).

Table 3. Disease Occurrence patterns: Sudden Onset Versus Symptom

Onset of disease		BMI				P. value
		<17	17-19	<19- 25	>25	
Sudden	21	2	0	4	10	0.011282
After symptoms	73	20	18	20	19	
Total	94	23	18	24	29	

Distribution of heredity in thyroid conditions among patients

The data on the prevalence of genetic variables in thyroid diseases reveals that a considerable percentage of the study group had a familial history of thyroid disorders. Specifically, 67% of participants (63 out of 94) indicated a heredity factor, whereas 33% (31 out of 94) did not, as table 4 emphasizes.

Table 4. Prevalence of heredity factors in thyroid condition

Heredity of thyroid condition	Frequency	Percent
Yes	63	67%
No	31	33%
Total	94	100%

Distribution of dietary patterns among participants

The data on dietary habits within the study group indicates that the predominant eating behavior, followed by 60.63% of participants, is a traditional diet. A minority of the population (19.14%) follows a balanced diet, reflecting an awareness of or emphasis on health-conscious eating practices. Furthermore, 11.71% of participants indicated adherence to a specific or specialized diet, whilst 8.52% were classified under the "other" group, as in table 5.

Table 5. Prevalence of Various Dietary Patterns in the Study Population.

Dietary patterns	Frequency	Percent
Traditional	57	60.63%
Balanced	18	19.14%
On a certain diet	11	11.71%
Other	8	8.52%
Total	94	100%

Distribution of food choices of meals among participants

The food preferences data presented in table 6 shows a breakdown of meal choices among the study participants. For breakfast, cheese is the most commonly consumed item (31.9%), followed by eggs (29.7%) and tuna (26.6%). A smaller percentage of participants reported eating Zometa (11.7%). At lunch, macaroni (41.4%) is the most frequently consumed food, followed by couscous (32.9%). Beans and Roshde were both consumed by 12.7% of participants, while 9.5% listed other food items. For dinner, eggs are again a popular choice, with 29.79% of participants including them in their meal. Other common foods include bread (19.15%) and milk (17%), while smaller percentages reported eating fruit (11.7%) and salad (6.3%). A considerable portion of the population (22.3%) mentioned consuming other food items for dinner.

Table 6. Food preferences: frequency and percentage of consumption

Food preferences		Frequency	Percent
Breakfast	Tuna	25	26.6%
	Eggs	28	29.7%
	Cheese	30	31.9%
	Zometa	11	11.7%
Launch	Couscous	31	32.9%
	Beans	12	12.7%
	Macaroni	39	41.4%
	Roshde	12	12.7%
	Others	9	9.5%
Dinner	Egg	28	29.79%
	Ffruit	11	11.7%
	Salad	6	6.3%
	Bread	18	19.15%
	Milk	16	17%
	Others	21	22.3%

Distribution of seafood consumption patterns

The data on seafood consumption among participants represented in figure 1 reveals that the majority of individuals include seafood in their diet at varying frequencies. Weekly consumption is the most common, with 40.4% of participants eating seafood on a weekly basis. A close percentage (37.2%) consumes seafood only "sometimes," indicating a more sporadic intake. A smaller portion of the population consumes seafood "rarely" (11.7%), while 8.5% reported never eating seafood. Only a very small fraction (2.13%) includes seafood in their daily diet.

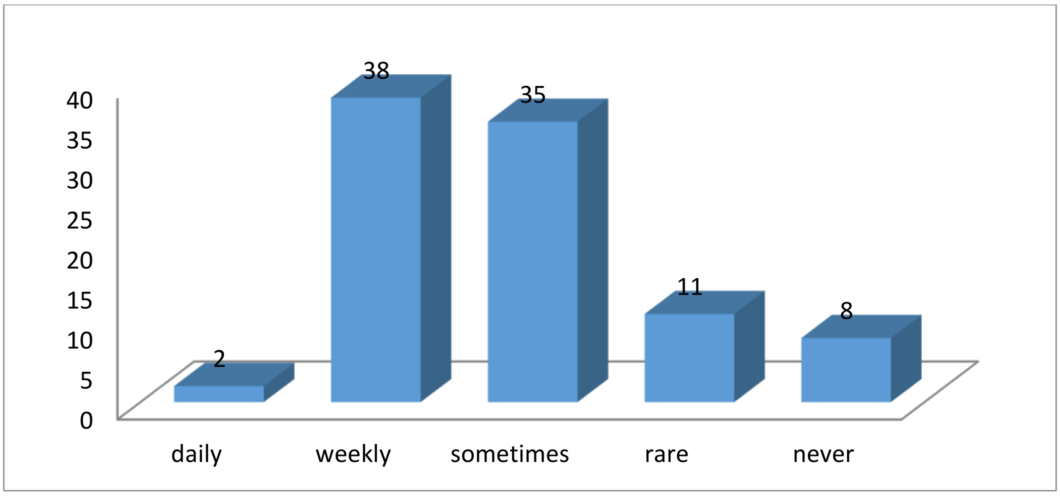

Figure 1. Consumption of seafood among participants.

Consumption Patterns of Iodine- and Phenol-Rich Vegetables and Fruits

Table 7 presents the frequency of iodine and phenol-containing vegetable and fruit consumption among participants. The predominant consumption pattern is biweekly, with 27.6% of people adhering to this practice. Subsequently, 25.5% of participants take these veggies and fruits three times weekly. A significant percentage, 21.2%, consume these meals five times weekly, while 12.7% partake daily, suggesting that certain individuals are consistently incorporating iodine- and phenol-rich foods into their diets. And further 12.7% indicate that they consume these items fewer than twice weekly.

Table 7. Frequency of Vegetables and Fruits Consumption Containing Iodine and Phenols

Vegetables and Fruits Consumption	Frequency	Percent
Daily	12	12.7%
Five times a week	20	21.2%
Three times a week	24	25.5%
Twice a week	26	27.6%
Less than that	12	12.7%
Total	94	100%

FSH hormone level distribution among patients

The frequency distribution of FSH hormone levels in the study population demonstrates significant variability among participants. The predominant group, constituting 34% of the population, exhibits FSH levels below 5, indicating a substantial proportion with relatively low hormone levels. Another considerable segment, 25.5%, falls within the 5 to less than 10 FSH range, while 13.8% of participants present levels between 10 and 15. Notably, 18.9% of participants' exhibit elevated FSH levels (above 15), suggesting that nearly one-fifth of the population may experience heightened hormonal activity, potentially associated with various physiological or pathological conditions, including reproductive and thyroid dysfunctions. Furthermore, a minor percentage (6.3%) displays FSH levels below 1 (Figure 2).

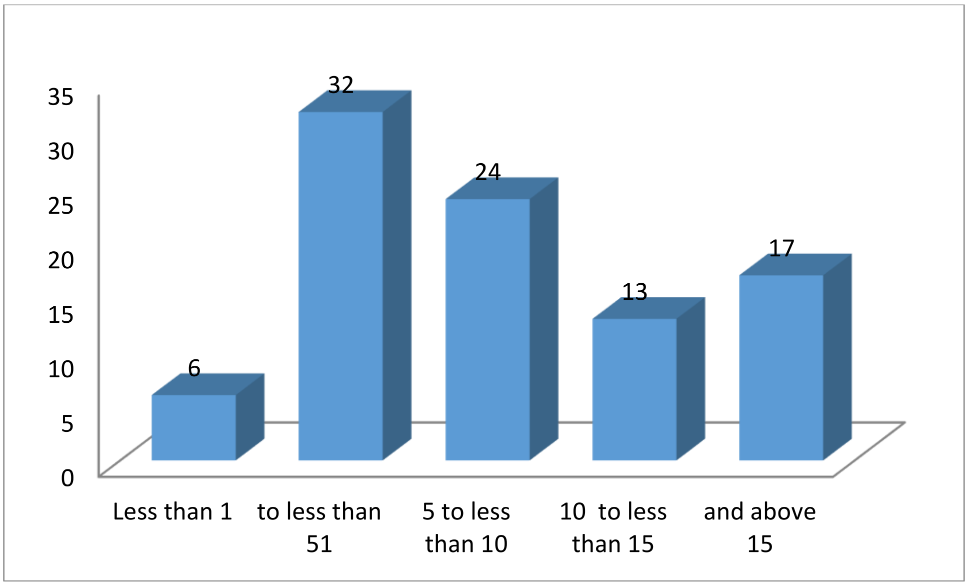

Figure 2. Levels of FSH hormone among study population.

BMI and seafood consumption correlation to FSH level

The relationship between body mass index (BMI) and FSH levels in thyroid patients shows a significant association, as reflected by a P-value of 0.000041 as shown in table 8. Participants with lower BMI, particularly those with BMI less than 17, showed higher FSH levels. Specifically, 10 participants in this group had FSH levels greater than 15, indicating a trend of elevated hormone levels in individuals with lower body mass. On the other hand, participants with a BMI of over 25 exhibited a tendency towards lower FSH levels, with 18 of them having FSH levels between 1 and 5. Seafood consumption also appears to have a significant effect on FSH levels in thyroid patients, with a P-value of 0.002334. Those who consume seafood weekly showed the most diverse range of FSH levels, with 15 participants displaying levels between 1 and 5, and 8 participants having levels between 10 and 15. Interestingly, those who rarely or never consumed seafood showed higher FSH levels, with 5 participants in both the "rare" and "never" groups having FSH levels above 15.

Table 8. Association between BMI, Seafood Consumption, and FSH Levels in Thyroid Patients.

Variables			**FSH level**					**P. value**
			<1	1 to less than 5	5 to less than 10	10 to less than 15	>15	
BMI	<17	23	0	2	4	7	10	0.000041
	17-19	18	1	2	6	3	6	
	20-25	24	2	10	8	3	1	
	>25	29	3	18	6	2	0	
Seafood consumption	Daily	2	1	1	0	0	0	0.002334
	Weekly	38	3	15	9	8	3	
	sometimes	35	2	16	10	3	4	
	Rare	11	0	0	4	2	5	
	Never	8	0	0	1	2	5	

DISCUSSION

The thyroid gland not only regulates metabolic processes but also produces numerous hormones, rendering it a crucial element of the body's physiology. The present study aimed to assess the influence of dietary patterns and diverse nutrient intake on thyroid function; given that thyroid dysfunction can arise from numerous factors. In this study, the majority of the participants (30.8%) have a BMI greater than 25, suggesting that a significant portion of the population falls within overweight or obese categories. This finding is consistent with a 2013 study that reported a high prevalence of subclinical hypothyroidism, especially in females, and noted that this prevalence increases with higher BMI levels [22]. Recent research has shown a strong positive relationship between BMI and hypothyroidism, highlighting that thyroid dysfunction is particularly common in obese patients [23], with the likelihood of thyroid abnormalities rising alongside BMI [24]. In fact, studies have recognized a link between thyroid hormones and metabolic risk markers, suggesting that thyroid function may influence body weight and obesity-related comorbidities. This was further supported by a 2019 cohort study that found correlations between thyroid function and body weight [25]. Additionally, elevated BMI is significantly associated with more aggressive clinico pathological features of the thyroid gland, as well as changes in its function [26]. This suggests that higher BMI not only affects metabolic health but may also exacerbate the severity of thyroid abnormalities, adding complexity to the management of thyroid diseases in individuals with obesity.
The results of this study reveal that a substantial proportion of the obese subjects are classified as having second-degree obesity, with 48.2% displaying a BMI ranging from 35 to 39.9. This is consistent with several researches on obesity and thyroid function, which demonstrate positive associations between BMI and TSH, as well as between BMI and both free and total T3. Minor increases in TSH and T3 or fT3 levels are prevalent thyroid irregularities noted in obese persons, including youngsters [27]. Research investigating the impact of obesity on the thyroid axis has revealed a heightened risk of thyroid malfunction in patients with extreme obesity [28]. In a study including obese Chinese adults with primary subclinical hypothyroidism and high TSH, the increase in T3 was associated with improved peripheral de- iodination and a transition towards T3 secretion. Genetic changes, including polymorphisms in deiodinases (DIOs) that convert T4 to T3, may affect thyroid hormone levels. Leptin, a hormone frequently increased in obesity, is crucial in controlling both peripheral and central DIOs, thereby influencing thyroid hormone levels and resulting in heightened fT3 concentrations and modified fT3/fT4 ratios [29].
A 2021 study indicated increased levels of free T3 and free T4 in women with class II obesity when compared to both the control group and individuals with class I obesity. This indicates that thyroid hormone abnormalities are most pronounced in patients with class II and III obesity [30]. A 2020 study revealed a significant prevalence of subclinical hypothyroidism (SCH) among young obese individuals, particularly in those classified with class II and III obesity [31]. The data collectively highlight a significant correlation between elevated BMI and heightened thyroid hormone variations, especially in patients with advanced obesity stages.
In this study, 67% of patients (63 out of 94) indicated a genetic component in their thyroid problem, consistent with results from multiple prior investigations. Thyroid and parathyroid disorders are rather prevalent and may occur owing to genetic or random influences. Hereditary thyroid neoplasms may arise from calcitonin-secreting C cells, resulting in familial medullary thyroid carcinomas (FMTCs). These encompass syndromes such as multiple endocrine neoplasia types IIA and IIB, along with pure familial medullary thyroid cancer syndrome [32]. A Turkish study conducted in 2012 revealed a robust correlation between thyroid illness and genetic variables [33].
Dietary and lifestyle modifications are essential for controlling thyroid health, given the thyroid's fundamental role in metabolic regulation and its strong association with metabolic disorders [34]. Numerous environmental disruptors (EDs),

including Bisphenol A (BPA), found in packaged foods and canned products, pose significant risks to thyroid health [35]. BPA is recognized for its ability to impair thyroid function via influencing gene expression, inducing cellular toxicity, and antagonizing thyroid receptors (TRs) [36]. Moreover, studies, like those by Berto-Júnio et al., have demonstrated that BPA affects thyroid-associated proteins such as PAX8 and TTF1, which are crucial for thyroid growth and hormone production [37].

A 2024 study emphasized that dietary changes can substantially influence gut microbiota, which subsequently influences thyroid function via processes like as immunological modulation, food absorption, and epigenetic modifications. These alterations may induce dysbiosis and micronutrient shortages, potentially resulting in thyroid dysfunctions such as hypothyroidism and hyperthyroidism, while also elevating the risk for autoimmune thyroid disorders and thyroid cancer, although many facets of these associations remain contentious [38]. A 2019 study indicated that several foods could impair thyroid function. Soy and cruciferous vegetables contain goitrin, a chemical that can impede thyroid hormone synthesis and is thus regarded as goitrogenic. Moreover, iodine-rich foods—such as cereals, seafood, meat, chicken, and milk—can result in thyroid abnormalities if ingested in either inadequate or excessive quantities. These studies emphasize the intricate interaction between diet and thyroid function, illustrating the hazards linked to particular foods and the necessity for a balanced dietary intake to preserve thyroid health [39].

Research underscores the advantageous impact of some nutrients and dietary elements on thyroid function. Selenium and zinc, recognized for their protective properties, are crucial for sustaining thyroid function by averting cellular damage and premature aging. A 2017 study corroborated this, acknowledging the significance of vitamin D and calcium in the management of thyroid illness [40]. A 2016 study highlighted that oily fish and shellfish are very advantageous in autoimmune thyroid illness because of their abundant selenium, iodine, iron, and zinc levels. Furthermore, fruits, in addition to providing critical vitamins, minerals, and fiber, are rich in polyphenolic chemicals that possess significant anti-inflammatory and antioxidant effects [41]. A 2022 study highlighted the essential significance of seafood in thyroid health, as it is a significant source of minerals such as iodine and selenium, which are crucial for thyroid function. Fish offers high-quality proteins and omega-3 polyunsaturated fatty acids (PUFA), particularly DHA and EPA, which engage with thyroid hormones at multiple levels, including transport proteins [42]. A Chinese study shown an adverse relationship between seafood-rich diets and the likelihood of thyroid disease, underscoring the significance of dietary balance and nutrient-dense food sources in fostering thyroid health and overall well-being [43].

In the present study, the majority of subjects (34%) exhibited FSH values below 5, signifying a substantial proportion with comparatively low levels of this hormone. Research substantiates the correlation between thyroid dysfunction and alterations in FSH levels, which can affect numerous endocrine and reproductive systems. A 2017 study indicated that both thyrotoxicosis and hypothyroidism affect endocrine, sexual, and reproductive hormones, while the hormonal alterations in hypothyroidism generally counter those observed in hyperthyroidism [44]. A 2023 study conducted in Iraq revealed significantly higher FSH levels in individuals with thyroiditis (average of 11.36 ± 13.14) compared to a control group (average of 5.764 ± 0.54), providing further insights on the thyroid-FSH relationship [45]. A 2015 study similarly identified a correlation between hyperthyroid symptoms and elevated serum FSH levels. The findings correspond with the current study's observations, indicating that thyroid dysfunction may result in alterations in FSH levels, likely due to the intricate connections between the thyroid and pituitary organs [46].

These data indicate the interconnection between BMI, nutrition, and hormonal equilibrium in individuals with thyroid conditions. Both underweight and overweight circumstances correlate with aberrant FSH levels, indicating the influence of body mass on the regulation of reproductive hormones. Underweight individuals have elevated levels of FSH, perhaps due to starvation, whereas overweight individuals demonstrate decreased FSH levels, possibly attributable to increased estrogen produced by adipose tissue. It also emphasizes that diet, especially seafood abundant in iodine, is crucial for hormonal equilibrium. Consistent use of seafood seems to promote more stable FSH levels, perhaps due to enhanced thyroid function, while a lack of seafood in the diet is associated with elevated FSH levels. Furthermore, it associates iodine consumption with reproductive and thyroid health. These findings suggest that managing body weight and ensuring sufficient iodine intake are essential for maintaining hormonal equilibrium in thyroid patients. Weight management should involve keeping a balanced diet, and the regular consumption of iodine-rich foods, such as seafood, may alleviate hormonal imbalances in thyroid disorders, hence enhancing the quality of life for affected individuals.

CONCLUSION

This study emphasizes notable relationships among BMI, dietary patterns, seafood intake, and FSH levels in patients with thyroid conditions. A significant percentage of participants were either underweight or overweight, with obesity affecting 30.8% of the sample. BMI significantly influenced FSH levels, with decreased BMI correlating with increased FSH, indicating a relationship between reduced body mass and hormonal imbalances. Likewise, fish consumption significantly affected FSH levels, as participants who consumed seafood weekly exhibited varied FSH levels, whereas those who infrequently or never eaten seafood had elevated FSH levels. Moreover, the findings indicated a significant hereditary factor in thyroid disorders. The study emphasizes the significance of accounting for BMI, dietary practices, and genetic factors in the management of thyroid disorders, since these components may affect hormonal control and disease advancement.

Acknowledgments
In this section, you can acknowledge any support given which is not covered by the author contribution or funding sections. This may include administrative and technical support, or donations in kind (e.g., materials used for experiments).

Conflicts of Interest
The authors declare no conflicts of interest.

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https://journal.utripoli.edu.ly/index.php/Alqalam/index eISSN 2707-7179

دراسة تقييم الأنماط الغذائية لدى مرضى الغدة الدرقية في مدينة الزاوية، ليبيا

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المستخلص

الغدة الدرقية تتأثر بعوامل مختلفة، بما في ذلك مؤشر كتلة الجسم(BMI) ، العوامل الوراثية، العادات الغذائية، والاختلالات الهرمونية، خاصة تلك المتعلقة بهرمون التحفيز الجريبي .(FSH) تهدف هذه الدراسة إلى فحص العلاقة بين مؤشر كتلة الجسم، الأنماط الغذائية، استهلاك المأكولات البحرية، مستوياتFSH ، والعوامل الوراثية لدى المرضى الذين يعانون من اضطرابات الغدة الدرقية. شملت هذه الدراسة المقطعية 94 مريضًا يعانون من اضطرابات الغدة الدرقية. تم تصنيف مؤشر كتلة الجسم إلى أربعة تصنيفات17>) ، 1917–، 2520–، (25<، كما تم تقسيم الأنماط الغذائية إلى نمط تقليدي، نمط متوازن، حميات خاصة، وأنماط أخرى. تم تصنيف استهلاك المأكولات البحرية إلى يومي، أسبوعي، نادر، بشكل غير متكرر، أو عدم الاستهلاك نهائيًا. تم تقسيم مستويات FSH إلى خمسة نطاقات1> :، من 1 إلى 5>، من 5 إلى 10>، من 10 إلى 15>، وأكثر من 15. تم جمع البيانات حول الوراثة، وتم إجراء تحليل إحصائي لتقييم العلاقات بين هذه الخصائص. أظهرت النتائج وجود علاقة معنوية بين مؤشر كتلة الجسم ومستويات(p = 0.000041) FSH ، حيث أظهر الأشخاص الذين لديهم مؤشر كتلة جسم أقل من 17 مستويات FSH مرتفعة 15>) في 10 مشاركين). أما الأفراد الذين تجاوز مؤشر كتلة الجسم لديهم 25 فقد أظهروا مستويات FSH منخفضة (تراوحت بين 1 وأقل من 5 في 18 شخصًا). كان لاستهلاك المأكولات البحرية تأثير كبير على مستويات(p = 0.002334) FSH ، حيث أظهر المستهلكون الأسبوعيون نطاقًا واسعًا من قيمFSH ، بينما أظهر غير المستهلكين أو المستهلكين بشكل غير متكرر مستويات FSH مرتفعة 15>) في 5 أشخاص). فيما يتعلق بالأنماط الغذائية، اتبع 60.63% نظامًا غذائيًا تقليديًا، في حين أن 67% من المرضى لديهم تاريخ عائلي لاضطرابات الغدة الدرقية. علاوة على ذلك، كان 48.2% من المشاركين يعانون من السمنة من الدرجة الثانية. تسلط هذه الدراسة الضوء على العلاقة المعقدة بين مؤشر كتلة الجسم، العادات الغذائية، استهلاك المأكولات البحرية، وتنظيم الهرمونات لدى المرضى الذين يعانون من اضطرابات الغدة الدرقية. يجب أخذ هذه العوامل، جنبًا إلى جنب مع الاستعدادات الوراثية، في الاعتبار عند إدارة مشاكل الغدة الدرقية لتحسين النتائج العلاجية للمرضى.

الكلمات الدالة. النظام الغذائي، الغدة الدرقية، الخلل الوظيفي، مؤشر كتلة الجسم، السمنة.