

Thyroid Hormone Disturbances Effects on Male Sexual Life

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Abstract

Background: The influences of thyroid hormone imbalances have recently piqued the public's interest. Many people suffer from sexual dysfunction, with 8-52% of males having erectile dysfunction (ED) or premature ejaculation (PE). The aim was to assess the thyroid hormone disturbances effects on male sexual life. **Subjects and method: Design:** A cross-sectional descriptive study research design was utilized to fulfill the aim of this study. **Setting:** The study was conducted at Fertility Outpatient Unit, Damanhur University Hospital, Damanhur City. **Subjects:** A convenient sample included a total of 240 patients recruited for the study. **Three tools** were used for data collection: Tool (1): A structured interview questionnaire which consisted of two parts; part (I) patient's demographic characteristics; part (II) patient's health history. Tool (2): anthropometric measurement tool, and Tool (3): lifestyle assessment Questionnaire for patients with thyroid hormone disturbances and sexual dysfunction. **Results:** The study result revealed that the mean age of the studied participants was 44.10 ± 12.01 , mean body mass index was 30.760 ± 6.136 , 40% of them were underweight, 75% have chronic diseases, 33.8% had hypertension, 17.5% have prostatic enlargement, and 25% had urination problems. There was a relation between thyroid hormone dysfunction and the patient's sexual life. **Conclusion:** Thyroid hormone disturbances had several effects on male sexual life; it may lead to several health problems, and causes erectile dysfunction. **Recommendations:** Thyroid hormone disturbances have detrimental effects on male sexual life and the nurses should be aware about this issue and share in patients' education and prevention practices.

Keywords: Male, sexual life, thyroid hormone disturbances.

Introduction:

The thyroid hormone has a variety of vital roles in human physiology, including regulating metabolism, enhancing the brain develop normally, and many other vital areas of healthy adult physiology

(Kabir et al 2015). Therefore, changes in thyroid gland function or interference with thyroid hormone's ability to exert its action may have negative impacts on development, metabolism, or adult physiology (Gravel et al., 2020). Thyroid hormone disorders have detrimental effects on the quality of life and have an impact on both physical and mental health (Shen et al., 2021)

Sex is something you might think about all the time but one can connect to the other including those that involve sexual health and pleasure. It should come as no surprise, then, that thyroid disorders often are associated with sexual dysfunction issues. Hormonal disorders including an underactive thyroid are responsible for one-third of sexual problems people experience (Cooper & Ladenson, 2018). Thyroid hormones have a major impact on the quality of sex life. An underactive thyroid lowers sex drive and can lead to a lower quality of sex life. When hormone TSH rises and hormone FT4 drops, the client might experience low sex drive, difficulty getting aroused, erectile dysfunction, inability to orgasm, and delayed ejaculation (Maitra, 2015).

Thyroid hormones control metabolism and regulate the heart and other muscles, and digestive function. Thyroid hormones also play a role in brain development and the building and maintenance of bones. At this point, you might be thinking, “If thyroid hormones play a role in all bodily functions, could that affect the erectile function? If the thyroid gland produces too much or too few thyroid hormones, it may lead to several health problems, erectile dysfunction being one of them (McCabe, et al., 2016 and Carosa et al., 2018)).

Hypothyroidism and hyperthyroidism may each cause erectile dysfunction because they cause symptoms including fatigue, low mood, and low sex drive (Rosen et al., 2017). These symptoms of both thyroid disturbances may make it difficult to feel aroused and/or achieve and maintain an erection (Rosen et al., 2016). Hyperthyroidism in men often paired with premature ejaculation and delayed ejaculation. Other processes involved in getting and maintaining an erection have been linked to thyroid hormone problems, including interference with the hormones that regulate the production of testosterone (the main male sex hormone) and weakened production of molecules that regulate blood vessel function in the penis (Serefoglu et al., 2014).

Thyroid dysfunction is considered one of the prevalent endocrine disorders. Thyroid dysfunction can lead to various health issues including cardiovascular disorders (Dorr & Volzke, 2018), abnormal glucose intolerance, impairment of liver function, dyslipidemia, and so on. Thyroid dysfunction may also cause psychological symptoms and affect the quality of life (Gulseren et al., 2016). It was found that even at the subclinical level, hyperthyroidism and hypothyroidism are associated with an overall reduction in medical well-being (Gill et al., 2019).

The two most common types of thyroid diseases are hypothyroidism and hyperthyroidism. The symptoms of hyperthyroidism often included fatigue, weight loss, irritability, muscle weakness, and palpitations (Smith et al., 2018). while hypothyroidism may result in fatigue, palmar

yellowing, dry skin, coarse hair, slurred speech, slowed mental activity, weight gain, and increased sensitivity to the cold (Song, 2019).

Studies from many areas around the world have investigated potential environmental risk factors for thyroid dysfunction. However, some of results remain controversial. For example, a survey identified smoking as a risk factor for hypothyroidism, while other studies failed to find any association (Vestergaard, 2017). Recent research found that smoking might reduce the risk of hypothyroidism. Besides smoking, other lifestyle factors need to be explored to identify additional contributors to the disease development (Andersen et al., 2014).

The influences of Thyroid hormone imbalances have recently piqued the public's interest (Gabrielson et al., 2019). Several sexual dysfunctions have been described in men including premature ejaculation, erectile dysfunction, ejaculatory dysfunction, and hypoactive sexual desire. Erectile dysfunction is defined as “the inability to achieve or maintain a penile erection continuously or repeatedly for sexual intercourse.”(Krysiak et al., 2018, McCarty & Dinsmore, 2019).

Male Aging Study observed that 52% of men ages 40–70 had erectile dysfunction, with rates increasing with age (Biondi & Cooper, 2019). While the majority of erectile dysfunction results from vascular compromise, an increased understanding of hormonal regulation of erectile function is making apparent the subtle, but important, influences of the endocrine system on erectile function (Xu et al., 2020).

Significance of the study:

The identification of the thyroid hormone receptors on the Sertoli cells could be path-breaking for identifying the impact of thyroid hormones on the adult testis. Individually; thyroid disease and sexual dysfunction are common conditions that can have a detrimental effect on the quality of life. Recent reports have documented an increasing prevalence of sexual dysfunction in patients with thyroid disorders (Gabrielion et al., 2019,

Pan et al., 2020, and Shen et al., 2021). As such, sexual medicine physicians need to be primed for the presentation of patients with overlying sexual and thyroid dysfunction to allow for proper management.

The identification of the type of receptor could help establish the molecular events by which the thyroid affects male reproductive function and fertility. Thyroid impacts testis development, spermatogenesis, and male fertility such that an abnormal thyroid profile could affect semen quality and may lead to infertility. So, the researchers aimed in this study to assess the thyroid hormone disturbances effects on male sexual life.

Aim of the study

The study aimed to assess the thyroid hormone disturbances effects on male sexual life.

Research question:

1. What are the thyroid hormone disturbances' effects on male sexual life?

Subjects and Methods:

Research design:

A cross-sectional descriptive study design was utilized to fulfill the aim of this study.

Settings:

The study was conducted at Fertility Outpatient Unit, Damanhur University Hospital, Damanhur City, Egypt. These settings were selected because of the high prevalence of patients in the selected settings and also it serves a biggest region of the population.

Sample:

A convenient sample included a total of 240 patients recruited for the study.

Tools for data collection:

Tool (1): A structured Interview Questionnaire:

It was developed by researchers after

reviewing the relevant national and international related literature. This tool consisted of the following two parts:

Part1: This part included data about patients' demographic characteristics as patients' age, gender, and education.

Part 2: This section included information patient's health history such as health history of chronic diseases and suffering from prostatic disorders.

Tool (II): Anthropometric measurement tool: This tool included the anthropometric measurements of the patients which is used to record weight, height, and body mass index (BMI) which was calculated by dividing weight (kilograms) by height in meters squared (kg/m²). Evaluation of growth status (underweight, normal, overweight, and obesity) using BMI was based on the score of centile is performed according to Egyptian centiles as the following: (1) a patient with a BMI equal to or above 85th centile but less than 95th centile is considered overweight and (2) A patient with a BMI equal to or above 95th centile is considered obese (Hockenberry and Wilson, 2007).

Tool (III): Lifestyle assessment Questionnaire for patients with thyroid hormone disturbances and sexual dysfunction: It was adapted from (Aiceles et al., 2017; Rodriguez-Castelan et al., 2019; Bates et al., 2020; Tannenbaum et al., 2022), and it was used to assess lifestyle among participants with thyroid hormone disturbances, Thyroid and sexual dysfunction among studied participants, Erectile Function, Orgasmic Function, sexual desire, and intercourse satisfaction.

Tool Validity and Tool Reliability:

The content validity of the tools was determined through an extensive review of the literature about the thyroid hormone disturbances effects on male sexual life". The content of the data collection tools was submitted to a panel of five experts in the Medical-Surgical Nursing field and the Andrology field with more than ten years of experience in the field. Modifications of the

tools were based on the panel's judgment on sentence clarity, content relevance, item sequence, and scoring and recording accuracy of the items. Examination of the content validity index (CVI) showed that $CVI = 88\%$. Reliability was assessed through Cronbach's alpha reliability test $\alpha = 89\%$ which revealed that each of the two tools consisted of relatively homogenous items as indicated by the moderate to the high reliability of each tool.

Pilot study:

It was performed on 10% of the sample (24 patients) for modification, clarification, and estimate of the time required to complete the research tools and test the feasibility of the research process. The goal of the pilot study was to ensure that the measurements were clear and applicable and that the time required to complete the tools was sufficient. To fill in the sheets unclear items were clarified, unnecessary items were omitted, and new items were added. Those who shared in the pilot study were excluded from the study sample

Methods:

Official letters were obtained to conduct the study. The researchers explained the aim of the study and confidentiality of all gathered information was assured. The study was conducted in the previously mentioned setting for a period of six months (from September 2021 to February 2022).

Data collection:

- Official permission was obtained from DamanhurUniversity Hospital administrators and the manager of the selected setting. The written informed consent was received and acquired from each patient.

- The researchers attended the previous setting of the study two times/ a week from 9 am to 1 pm. The data were collected using study's' tools. The participants took approximately 25-30 minutes to complete the questionnaire.

- Participants completed the questionnaire at baseline that included information about demographic characteristics, health history, and lifestyle. The researchers

interviewed the participants at the waiting area beside the Fertility Outpatient Unit.

- All measurements such as weight and length were measured by the researchers in the previously mentioned setting. Weight was measured using an electronic weighing scale, and the scale records weights in kilograms. It was adjusted to zero before each reading. The length was measured in centimeters using a plastic anthropometric tape from which body mass index (BMI) was calculated (kg/m^2)

Administrative and ethical considerations:

Ethical approval was guaranteed from the institutional review board of the Faculty of Nursing, Zagazig University. The manager of the previously selected setting and the director of the selected outpatient each received written approval from the dean of DamanhurUniversity's faculty of nursing. The researchers first introduced themselves to the patients and then explained the aim of the study at the beginning of the interview, so the patients were reassured that all gathered information would be confidential. The researcher informed them that the study is voluntary; they have the right to withdraw from the study at any time, without giving any reason, and that their responses would be held confidentially.

Statistical analysis:

The data obtained were reviewed, prepared for computer entry, coded and scored, then analyzed and tabulated. Data entry and analysis were performed using SPSS (statistical software package) version 17.0. Data are expressed as the means, SD, and percentage distribution. A person's correlation is used for the numeric variable. $P > 0.05$ was not significant, and $P < 0.05$ was used as a cutoff for significance.

Results:

Table (1) shows that the mean age of the studied participants was 44.10 ± 12.01 . Regarding the level of education of the studied participants, it was observed that 57.5 of them had bachelor's degrees, 31.7% of them had one child and their mean Body Mass Index

was 30.760 ± 6.136 . It was noticed that 40% of them were underweight.

Figure (1): Shows the percentage of the studied participants according to their Body Mass Index, it was revealed that 40% of the studied participants were underweight, 22.5% were obese, and 12.5% were overweight.

Table (2) portrays the lifestyle among participants with thyroid hormone disturbances, it was clear that 42.5% of them practice exercise, 40% practiced for less than 30min, and 50.0% were not smoking.

Table (3): Reveals the health history among participants with thyroid hormone disturbances, it was noticed that 75% of them have chronic diseases and a high percentage of 33.8% have hypertension, 17.5% of them suffer from prostatic enlargement, and 25% had urination problems.

Figure (2): Shows the percentage of the studied participants according to their health history of chronic diseases, it was revealed that 33.80% of the studied participants had hypertension, 30% had atherosclerosis, and 20% had COPD overweight.

Table (4): Illustrates thyroid and sexual dysfunction among studied participants, 30% of the studied participants had thyroid dysfunction, 58.3% of had thyroid laziness, 41.7 of them had a difference in sexual activity, and 32.5% of them visited an andrology clinic or sexual health.

Table (5): Shows the erectile function among participants with thyroid hormone disturbances, 35% of the studied participants were most times able to get an erection during sexual activity, and 40% of them were most times able to **erection occurred** with sexual excitement and was the erection strong enough to enter the vagina, 42% of them were always during intercourse able to maintain an erection after penetration and 32% of the studied participants were average rate in confidence that can get and keep an erection.

Table (6): Demonstrated the orgasmic function, and sexual desire among participants with thyroid hormone disturbances, 52.5% of

them always ejaculate if had sexual stimulation or sexual intercourse, and 45% of them always feel an orgasm with sexual stimulation or sexual intercourse (with or without ejaculation, 37.5% of them always feel sexual desire, 35% of them rate the excellent level of sexual desire.

Table (7): Reveals intercourse satisfaction and overall satisfaction among participants with thyroid hormone disturbances, it was cleared from the table that 50% of the studied participants attempted sexual intercourse during the last two months 1-2 times, and 30% of them reported that the intercourse enjoyable was excellent and the same percentage was moderate. Concerning overall satisfaction, 30% of the patients said equally satisfied and unsatisfied. Regarding satisfaction with a sexual relationship with a partner, it was revealed that 30% of the studied patients reported that they were very satisfied with their partner in a sexual relationship.

Table (8) illustrates the relation between thyroid dysfunction and the patient's sexual life; it was observed that there was a significant correlation between thyroid dysfunction and sexual desire with statically significant differences ($p < 0.001$). Also, there was a significant correlation between thyroid dysfunction and overall satisfaction with statically significant differences ($p 0.003^*$).

Table (9) portrays the relation between Sexual Desire, Erectile Function, Orgasmic function, Intercourse Satisfaction, and Overall Satisfaction, it was noticed that there was a correlation between sexual desire and erectile function. Meanwhile, there is a significant correlation between sexual desire and intercourse satisfaction ($p. > 0.05$). There were significant correlations between sexual desire, erectile function, orgasmic function, intercourse satisfaction, and overall satisfaction with ($< 0.001^{**}$, $< 0.001^{**}$, 0.017^* , $< 0.001^{**}$, $< 0.001^{**}$) respectively.

Table (10): Shows that there was a statistically significant correlation between age and sexual desire among the studied patients. There was a significant correlation between patients' age and erectile function ($p. 0.011$, 0.033) respectively. The same table revealed

that there was a statistically significant satisfaction and also, with overall satisfaction correlation between BMI and intercourse withp. <0.001**.

Table (1): Distribution of the studied participants according to their demographic Characteristics (No=240).

Demographic Characteristics	N	%
Age		
<30	20	8.3
30-40	66	27.5
40-50	66	27.5
50-60	60	25.0
>60	28	11.7
Mean ± SD	44.10±12.01	
Level of educational		
None educated	18	7.5
Primary school	22	9.2
Secondary School	38	15.8
Bachelor's degree	138	57.5
Higher education	24	10.0
Number of children		
0	56	23.3
1	76	31.7
2	30	12.5
3	36	15.0
4	24	10.0
5 or more	18	7.5
Body Mass Index		
Underweight	96	40.0
Normal weight	10	4.2
Overweight	30	12.5
Obese class I	54	22.5
Obese class II	26	10.8
Obese class III	24	10.0
Mean ± SD	30.760±6.136	

Figure (1): Percentage of the studied participants according to their Body Mass index:

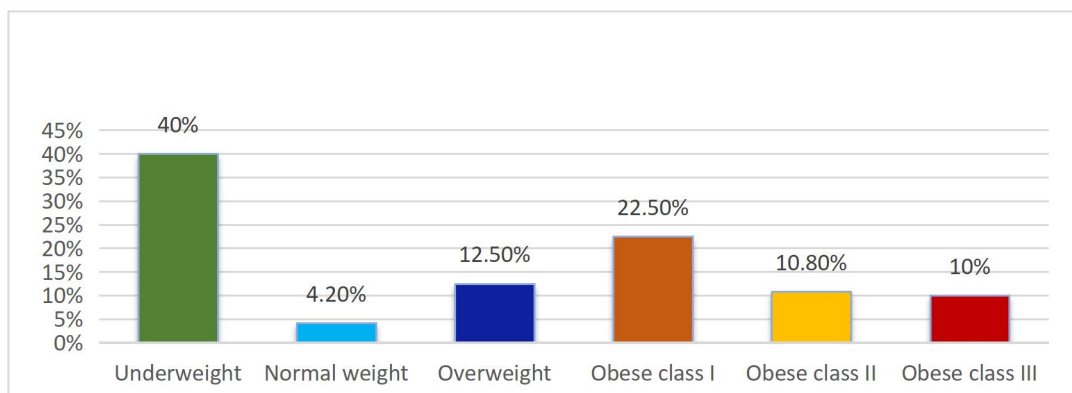


Table (2): Lifestyle among participants with thyroid hormone disturbances (No=240).

Variables	N	%
Do you practice any exercise?		
Yes	102	42.5
No	138	57.5
What kind of sport do you do?		
I don't practice.	120	50.0
Walk	108	45.0
Weight lifting	12	5.0
How many times do you exercise throughout the week?		
None	120	50.0
<3 days	36	15.0
3-4 days	42	17.5
More than 5 days	42	17.5
Duration of exercise per day		
None	120	50.0
Less than 30min.	96	40.0
30-60min.	14	5.8
>one hour	10	4.2
During the past two weeks, have you felt a lack of interest or enjoyment?		
Every day	12	5.0
More than half of the days	18	7.5
Some days	66	27.5
Never	144	60.0
Have you felt depressed in the past two weeks?		
Every day	12	5.0
More than half of the days	18	7.5
Some days	90	37.5
Never	120	50.0
Are you a smoker?		
Yes	13	32.5
No	120	50.0
Ex-smoker	42	17.5
Do you use any of the following smoking methods?		
Non-smoker	120	50.0
Shisha	48	20
Cigarettes	60	25
Electronic cigarettes	12	5

Table (3): Health History among participants with thyroid hormone disturbances (No=240).

Variables	N	%
Do you have any chronic diseases?		
Yes	160	75.0
No	80	25.0
If the answer to the previous question is (yes) Mention it		
Diabetes Mellitus	22	13.8
Heart failure	15	9.4
Hypertension	54	33.8
Atherosclerosis	48	30
Renal failure	6	3.8
Liver cirrhosis	7	4.4
Splenomegaly	4	2.5
COPD	32	20
Asthma	18	12
Neurological disorders	4	2.5
Psychological disorders	9	6
Other	5	3.1
Do you suffer from prostatic disorders?		
Prostatitis	24	10.0
Prostatic enlargement	42	17.5
Varicocele	18	7.5
Prostatic tumor	6	2.5
No	150	62.5
Do you suffer from any of the following?		
Urination problems	60	25.0
Frequent pelvic pain	36	15.0
Pelvic or genital surgery or radiotherapy	54	22.5
Nothing	90	37.5
Have you ever used one of the following medications?		
Testosterone injections	30	12.5
Erection pills	90	37.5
Penile injection	24	10.0
Other treatments to increase sexual ability	60	25.0
Nothing	36	15.0

Figure (2): Percentage of the studied participant's health history of chronic diseases

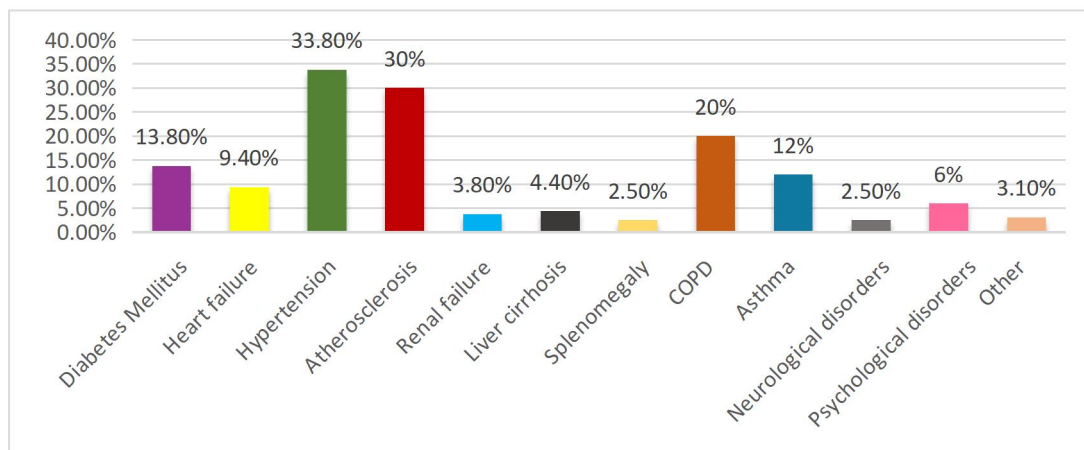


Table (4): Thyroid and sexual dysfunction among studied participants

Variables	N	%
Thyroid dysfunction		
Yes	72	30.0
No	168	70.0
If the answer to the previous question is (yes), what is the type of disorder?		
Thyroid laziness	42	58.3
Thyroid gland activity	30	41.7
Was there is a difference in sexual activity?		
Yes	30	41.7
No	42	58.3
Have you ever visited an andrology clinic or sexual health?		
Yes	78	32.5
No	162	67.5

Table (5): Erectile Function among participants with thyroid hormone disturbances (No=240).

Erectile Function	N	%
How often were you able to get an erection during sexual activity?		
Almost never or never	12	5.0
A few times	66	27.5
Sometimes	36	15.0
Most times	84	35.0
Almost always	42	17.5
If an erection occurred with sexual excitement, how often was the erection strong enough to enter the vagina?		
Almost never or never	18	7.5
A few times	24	10.0
Sometimes	42	17.5
Most times	96	40.0
Almost always	60	25.0
During intercourse, how long were you able to maintain an erection after penetration?		
Never	30	12.5
A few times	30	12.5
Sometimes	42	17.5
Most times	36	15.0
Always	102	42.5
During intercourse, how difficult is it to maintain an erection to complete intercourse?		
Not difficult	102	42.5
Slightly difficult	84	35.0
Difficult	30	12.5
Very difficult	6	2.5
Extremely difficult	18	7.5
How do you rate your confidence that you can get and keep your erection?		
Very low	12	5.0
Low	48	20.0
Average	78	32.5
Good	66	27.5
Excellent	36	15.0

Table (6):Orgasmic Function, and sexual desire among participants with thyroid hormone disturbances (No=240).

Orgasmic Function	N	%
How often did you ejaculate if you had sexual stimulation or sexual intercourse?		
Never	24	10.0
A few times	12	5
Sometimes	36	15.0
Most times	42	17.5
Always	126	52.5
How often have you felt an orgasm with sexual stimulation or sexual intercourse (with or without ejaculation)?		
Never	18	7.5
A few times	18	7.5
Sometimes	54	22.5
Most times	42	17.5
Always	108	45.0
Sexual Desire		
How often did you feel sexual desire?		
Never	12	5.0
A few times	36	15
Sometimes	42	17.5
Most times	60	25.0
Always	90	37.5
How would you rate your level of sexual desire?		
Very low	18	7.5
Low	38	15.8
Average	52	21.7
Good	48	20.0
Excellent	84	35.0

Table (7): Intercourse satisfaction and overall satisfaction among participants with thyroid hormone disturbances (No=240).

Intercourse Satisfaction	N	%
How many times have you attempted sexual intercourse during the last two months?		
11-20 times	6	2.5
7-10 times	12	5.0
5-6 times	30	12.5
3-4 times	54	22.5
1-2 times	120	50.0
No attempts	18	7.5
How often was it satisfying to you when you attempted sexual intercourse?		
Never	18	7.5
A few times	48	20.0
Sometimes	54	22.5
Most times	30	12.5
Always	90	37.5
To what extent was the intercourse enjoyable?		
I did not enjoy	12	5.0
Low enjoyed	24	10.0
Moderate enjoyed	72	30.0
Highly enjoyed	60	25.0
Excellent enjoyable	72	30.0
Overall Satisfaction		
How satisfied have you been with your overall sex life?		
Very Unsatisfied	24	10.0
Unsatisfied	48	20.0
Equally satisfied and unsatisfied	72	30.0
Satisfied	72	30.0
Very satisfied	24	10.0
How satisfied have you been with your sexual relationship with your partner?		
Very Unsatisfied	18	7.5
Unsatisfied	36	15.0
Equally satisfied and unsatisfied	54	22.5
Satisfied	60	25.0
Very satisfied	72	30.0

Table (8): The relation between thyroid dysfunction and patient's sexual life (No=240).

	Thyroid dysfunction						T-test	
	No			Yes			t	P-value
	Mean	±	SD	Mean	±	SD		
Erectile Function	8.107	±	1.729	7.500	±	1.834	1.000	0.324
Orgasmic Function	8.964	±	2.975	7.833	±	3.996	0.989	0.327
Sexual Desire	21.893	±	7.036	21.750	±	6.510	146.738	<0.001*
Intercourse Satisfaction	8.036	±	2.219	7.167	±	2.758	1.055	0.369
Overall Satisfaction	7.250	±	2.351	6.917	±	2.968	2.947	0.003*
Total score	54.250	±	13.209	51.167	±	13.710	0.673	0.511

Table (9): The correlation between Sexual Desire, Erectile Function, Orgasmic function, Intercourse Satisfaction, and Overall Satisfaction (No=240).

	Sexual Desire		Erectile Function		Intercourse Satisfaction		Orgasmic Function		Overall Satisfaction	
	r	P-value	R	P-value	r	P-value	r	P-value	r	P-value
Erectile Function	0.486	0.001**								
Intercourse Satisfaction	0.118	0.469	0.432	0.006*						
Orgasmic Function	0.398	0.011*	0.745	<0.001**	0.127	0.436				
Overall Satisfaction	0.608	<0.001**	0.241	0.134	0.388	0.033*	0.645	<0.001**		
Total score	0.928	<0.001**	0.640	<0.001**	0.387	0.017*	0.794	<0.001**	0.843	<0.001**

Table (10): The correlation between age and BMI with the sexual variables (No=240).

	Age		BMI	
	R	P-value	r	P-value
Sexual Desire	-0.397	0.011*	0.136	0.402
Erectile Function	0.328	0.033*	0.178	0.266
Intercourse Satisfaction	-0.218	0.181	0.639	<0.001**
Orgasmic Function	0.143	0.389	0.151	0.372
Overall Satisfaction	-0.285	0.094	0.468	0.001**
Total score	-0.079	0.426	0.239	0.138

Discussion:

More and more clinical research has confirmed that thyroid disorders are associated with a detrimental effect on the quality of life, affecting both physiological and psychological conditions (Krysiak et al., 2021). Hence, the study aimed to assess the thyroid hormone disturbances effects on male sexual life.

Concerning the Body Mass Index of the studied participants, the present study revealed that two-fifth of the studied participants were underweight, more than one-fifth were obese, and less than fifteen percent were overweight. This result was supported by Lee et al., (2019) who studied "Evaluation of the relationship of subclinical hypothyroidism with metabolic syndrome and its components in adolescents" and reported the same results. Similarly, Liu, et al., (2018) who conducted a study about "Association between thyroid hormones, thyroid antibodies, and cardio-metabolic factors in non-obese individuals with normal thyroid function" and found that more than one-third of the sample was underweight and less than one-fifth was overweight

The present study revealed that about one-third of the studied participants had hypertension, and slightly less than one-third had atherosclerosis. These findings were compatible with the findings of Bernal et al.,

(2019) who studied "Association between erectile dysfunction and carotid subclinical atherosclerosis in HIV infected patients" and mentioned that less than of the sample had hypertension.

Concerning thyroid and sexual dysfunction among studied participants, less than one-third of the studied participants have thyroid dysfunction and less than one-half of them had a difference in sexual activity.

This finding was in line with Corona et al., (2017) who noticed in their study entitled "Effect of hyperprolactinemia in male patients consulting for sexual dysfunction" that associations are truly responsible for the persistence of sexual dysfunction secondary to other causes of impaired sexual function or a result of suboptimal control of thyroid disease could not be ruled out.

Also, this finding was consistent with Cesare et al., (2015) who done a study about "Prevalence of Sexual Symptoms in Male Hypo- and Hyperthyroid Patients" and indicated that most patients with a chronic thyroid disease experience some sexual symptoms, such as PE in hyperthyroidism, DE in hypothyroidism, and HSD and ED in both conditions. From the researchers' point of view, this is reflected the important need to apply this study.

Regarding the erectile function among

participants with thyroid hormone disturbances, more than one-third of the studied participants were most times able to get an erection during sexual activity. This result was in accordance with **Corona et al., (2017)** who concluded have a negative association between erection and sexual satiety in men was found. Nevertheless, the relation between erectile dysfunction and hypothyroidism remains controversial. A large study involving a 2,146-sample size demonstrated no effect of hyperprolactinemia on ED.

Concerning the orgasmic function and sexual desire among participants with thyroid hormone disturbances, more than half of them always ejaculate if had sexual stimulation or sexual intercourse. Supporting the previous results by **Yildirim, et al., (2018)** who studied "Effect of hypothyroidism on the purinergic responses of corpus cavernosal smooth muscle in rabbits" and found that penile smooth muscle in hypothyroid rabbits was less relaxing than in control groups.

This was consistent with **Udenze et al., (2018)** who conducted a study concerning "Thyroid function in adult Nigerians with metabolic syndrome" and argued that an association between hypothyroidism and SD. Finally, **Cihan et al., (2019)** who studied "The relationship between premature ejaculation and hyperthyroidism" and examined the relationship between hyperthyroidism and PE from the opposite perspective, were starting with men with hyperthyroidism rather than sexual dysfunction. In a single-center, prospective observational study of 49 men with untreated hyperthyroidism, less than three-quarters had PE.

Results of the current study revealed that half of the studied participants attempted sexual intercourse during the last two months 1-2 times, and less than one-third of them reported that the intercourse enjoyable was or excellent. Regarding satisfaction with a sexual relationship with a partner, it was revealed that less than one-third of the studied patients reported that they were very satisfied with their partner in a sexual relationship. These results are consistent with the results of **Dutra et al., (2020)** who studied "Prevalence of hypoactive

sexual desire disorder among sexually active men with metabolic syndrome at a public hospital clinic in Brazil" and reported that patients enjoyed the intercourse and were very satisfied with their partner in a sexual relationship.

Results of the current study revealed that there was a significant correlation between thyroid dysfunction and sexual desire with statically significant differences. The findings of the present study are supported by the study conducted by **Bates et al., (2020)** who studied "Effect of thyroid hormone derangements on sexual function in men and women" and indicated that overt hypothyroidism and the risk of SD in men are associated and **Corona et al., (2016)** who conducted a study entitled "Endocrinologic Control of Men's Sexual Desire and Arousal/Erection "and concluded endocrine abnormalities are common in patients with sexual dysfunction and strongly encouraged in disturbances of sexual desire and arousal. From the researchers' point of view, it reflected the negative effect of thyroid dysfunction on sexual desire.

Results of the current study indicated that there was a significant correlation between thyroid dysfunction and overall satisfaction with statistically significant differences. From the researchers' point of view, it confirmed that thyroid dysfunction affected overall satisfaction due to penile smooth muscle less relation as a result of thyroid dysfunction. The study is in the same line as **Nguyen et al., (2017)** who studied "Erectile Dysfunction in Young Men—A Review of the Prevalence and Risk Factors" and mentioned that a significant correlation was found between thyroid dysfunction and overall satisfaction of the studied sample.

Findings of the current study revealed that there was a correlation between sexual desire and erectile function. Meanwhile, there is a significant correlation between sexual desire and intercourse satisfaction. The same study conducted by **Krysiak et al., (2019)** who done a study about "The effect of L-thyroxine treatment on sexual function and depressive symptoms in men with autoimmune hypothyroidism " and concluded that in this cohort, sexual desire, erectile function,

intercourse satisfaction, orgasmic function, sexual desire, and overall satisfaction were positively correlated. From the researchers' point of view, it could be explained that strong sexual desire provides an opportunity for good erectile function and intercourse satisfaction.

According to the findings of the current study, there was a statistically significant correlation between age and sexual desire among the studied patients. There was a significant correlation between patients' age and erectile function. This result was in agreement with the study done by **Nikoobakht et al., (2019)** who studied "The role of hypothyroidism in male infertility and erectile dysfunction" and found the same results. From the researchers' point of view, it could be explained by that young age patients had strong sexual desire than old patients.

Findings of the current study showed that there was a statistically significant correlation between BMI and intercourse satisfaction and also, with overall satisfaction. From the researchers' point of view, it could be explained that being overweight and underweight may cause fatigue for the patients which may interfere with intercourse satisfaction.

Conclusion:

Based on the findings of the present study, the present study concluded that thyroid hormone disturbances had several effects on male sexual life, may lead to several health problems, and causes erectile dysfunction

Recommendations:

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

- The study suggested organized educational programs should be integrated and needed to improve patients' knowledge regarding thyroid hormone disturbances and their effects on the male sex.
- Further studies and replication of the current study with a larger sample in different settings

are required for generalizing the results.

Conflicts of interest

The author declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

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