

Effect of An Educational Protocol on Hypothyroidism Patients' Knowledge and Practice

Wafaa Afifi Abd Elazeem¹, Heba Abd Elkader Ali² and Doaa Mohamed Mahmoud³

(1) Nursing Specialist in Technical Health Institute in Benha, (2) Professor of Medical Surgical Nursing, Faculty of Nursing, Benha University and (3) Lecturer of Medical Surgical Nursing, Faculty of Nursing, Benha University.

Abstract

Background: Hypothyroidism is a common condition of thyroid hormone deficiency. Patient's knowledge and awareness about diseases and its treatment is very important for good long-term outcomes. **Aim:** The study was aimed to evaluate the effect of an educational protocol on hypothyroidism patients' knowledge and practice. **Research design:** A quasi-experimental research design was utilized. **Setting:** The study was conducted in Outpatient clinics at Benha University Hospital and Educational Hospital affiliated to Ministry of Health Qalyubia Governmental, Egypt. **Sample:** A purposive sample composed of 60 patients with hypothyroidism. **Tools:** Two tools were utilized to collect data: **1)** A Structured assessment questionnaire which consisting of two parts: A) Patients' personal data and medical history. B) Patients' knowledge assessment. **2)** Patients' Practice Assessment. **Results:** There was a marked improvement in patients' knowledge and practice regarding hypothyroidism with a highly statistically significant difference between pre and post implementing of an educational protocol. **Conclusion:** The educational protocol had been proved to be significantly effective in improvement of studied patients' knowledge and practice regarding hypothyroidism. **Recommendations:** Orientation programs on mass Medias for measuring thyroid function in all adults specially at age of 35 years and every 5 years, more frequent screening for high risk or symptomatic individuals. Further research is needed on a larger probability sample at different settings to generalize the results.

Key words: Educational Protocol, Hypothyroidism, Patients' Knowledge and Practice.

Introduction

The thyroid gland is a butterfly-shaped organ composed of bulbous right and left lobes connected in the midline by a thin structure called the isthmus. Located in the front of the neck just above the trachea. It weighs approximately 15 to 20 grams in the adult human. The thyroid produces and releases into the circulation at least two potent hormones, thyroxine (T₄) and triiodothyronine (T₃), which influence basal metabolic processes and/or enhance oxygen consumption in nearly all body tissues. Thyroid hormones also influence linear growth, brain function including intelligence and memory, neural development, dentition, and bone development (Algaïd et al., 2019).

Hypothyroidism is a common condition of thyroid hormone deficiency, which is readily diagnosed and managed but potentially fatal in severe cases if untreated. The definition of hypothyroidism is a hypometabolic state that results from deficient production of thyroid hormone T₄ and T₃ by the thyroid gland (Hegedüs et al., 2022).

Thyroid disorders are important and growing health problems worldwide. Dysfunction of thyroid gland is one of the commonest endocrine disorders in clinical practice. This condition is described as an altered serum thyroid-stimulating hormone (TSH) level with or without altered thyroid hormones, it is considered a major public health problem. Many factors can affect the prevalence of thyroid

disorders; most important are: age, sex, environmental factors, geographic factors, iodine intake and ethnicity (**Thiruvengadam & Luthra, 2021**).

The most common clinical manifestations of hypothyroidism in adults are fatigue, lethargy, cold intolerance, weight gain, constipation, change in voice, slowed speech and intellectual function, slowed reflexes, hair loss and dry skin, but the clinical presentation can include a wide variety of symptoms that differ with age, sex, and time between onset and diagnosis. It is more prevalent in women than men (**Alam et al., 2020**).

Patient's knowledge and awareness about diseases and its treatment is very important for good long-term outcomes and compliance in any chronic diseases. Nursing instructions for patients has a very important role before, during and after the therapy to limit levothyroxine complication and improve patient's physical, social and emotional problems. It has been recognized that general awareness about hypothyroidism is poor and is associated with inadequate knowledge, wrong beliefs, and practices in a significant proportion of patients (**Hallit et al., 2021**).

Significance of the Study:

The worldwide prevalence of hypothyroidism is between 1% and 2% and ten times more common in women than in men while approximately 8% of women and 3% of men have subclinical hypothyroidism. According to reports from developing countries, the prevalence of primary hypothyroidism (TSH > 6 μ IU/ml) is 7.5% in women and 2.8% in men, and it is reported to be 5% in multiple populations (**Chahine et al., 2019**).

In Egypt, the prevalence of thyroid disease according to Alexandria Thyroid Association, is constantly increasing and reaches 10% present of the population. According to the annual reports of the University Hospital and the educational Hospital in Benha city, Qalyubia Governorate, it was found that the number of

diagnosed cases of hypothyroidism represents 10.4%.

Hypothyroidism has profound impact on health. Globally, thyroid disorders continue to be one of the most under-diagnosed and neglected chronic health conditions. Patients' knowledge and awareness about the disease and its treatment is very important for good long-term outcome and compliance in any chronic disease (**Giorda et al., 2017**).

Aim of the study

This study aimed to evaluate the effect of an educational protocol on hypothyroidism patients' knowledge and practice.

Research Hypothesis:

H1: Patients' knowledge will be improved after implementing an educational protocol regarding hypothyroidism.

H2: Patients' practices will be improved after implementing an educational protocol regarding hypothyroidism.

Subjects and Methods

Design: A quasi-experimental research design was utilized to meet the aim of this study.

Setting:

The study was conducted at outpatient clinics at Benha University hospital affiliated to Benha University and educational hospital affiliated to Ministry of Health. The Outpatient Clinics are located on the ground floor.

Subject:

A purposive sample of 60 patients with hypothyroidism who attended outpatient clinics during six months from (July 2021 to December 2021) and willing to participate at the study after fulfilling the following criteria:

Inclusion criteria:

- Primary hypothyroidism patients with age ranged from 20 - 60 years, who were on treatment for at least 3 months

Tools of Data Collection:

Two tools were used to for data collection:

Tool I: A structured assessment interview questionnaire: It was designed by the researcher after reviewing of recent related

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literatures, it was used to assess the personal data, the past and present medical history, and patients' knowledge regarding to hypothyroidism, and composed of two parts as the following:

Part I: Patients' personal data and medical history: this part was concerned with assessment of patients':

A- Personal data related to their age, gender, educational level, occupation, residence, marital status and smoking habits.

B- Medical history (past and present): As past medical history of chronic diseases, previous surgery, previous hospitalization, onset of the diagnosis, weight and height.

Part II: Patients' knowledge assessment regarding hypothyroidism pre and post educational protocol:

It was designed by the researcher after reviewing related literatures; **Alhazmi, et al., 2020; Sethi, et al, 2018** to assess patients' knowledge about hypothyroidism.

Knowledge scoring system:

The patients' knowledge was checked with a model key answer and accordingly patients' knowledge was categorized into either the complete correct answer that was scored as two, the incomplete correct answer was scored as one score and the incorrect answer that was scored as a zero. The total score of the questionnaire was 30 scores. These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **Good level of knowledge** if score $>70\%$ (22-30 score).

- **Average level of knowledge** if score from 60-70 % (18-21 score).

- **Poor level of knowledge** if score $<60\%$ (less than 18 score).

Tool II: Patients' practices checklist (pre and posttest): It was modified by the researcher after reviewing the related national and international literatures; **Emerson, 2018; Masaki et al., 2019**. It was used to assess patient's practices regarding hypothyroidism and their effect on

patients' health. The checklist consisted of 27 steps under three domains divided as medication adherence (6 steps), diet (11 steps) and lifestyle (10 steps).

Practice scoring system:

The total score of patient's practice were 27 score, each item was evaluated as "done" was scored one point and "not done" was scored zero point. These scores were summed up and were converted into a percentage score. It was classified into 2 categories:

- **Satisfactory practice** if score $\geq 60\%$ (more than 16.2 score).

- **Unsatisfactory practice** if score $<60\%$ (less than 16.2 score).

Teaching protocol booklet

It was prepared by the researcher after reviewing related literatures (**Timby & Smith, 2017; Hinkle & Cheever, 2018; Perry et al., 2019**). It was designed by the researcher to improve patients' knowledge and practice related to hypothyroidism, written in a very simple Arabic language, and supplemented by photos and illustrations for better understanding of contents. It was divided into theoretical and practical parts.

Content Validity:

Tools of data collection were investigated for their content validity by panel of three expertise in the field of medical surgical nursing at faculty of nursing, at Benha University who were selected to test content validity of the tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinion was elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration.

Tool Reliability:

Internal consistency reliability of all items of the tools was assessed using Cronbach's alpha coefficient. Structured assessment questionnaire was 0.81 and patients' practices assessment was 0.85.

Ethical considerations:

The researcher clarified aim of the study to the studied patients' and verbal approval was prerequisite to participate in the study. Patients were assured that all gathered data were used in research purpose only and the study was harmless. Additionally, patients were allowed to withdraw from the study at any time without giving the reason. Confidentiality of the gathered data and results were secured.

Field Work

The following phases were adopted to achieve the aim of the current study; assessment, planning, implementation and evaluation phases. These phases were conveyed from the earliest starting point of July 2021 to December 2021 covering 6 months.

Assessment Phase

Assessment phase involved interviews with patients to collect baseline data. The researcher visited outpatient clinics at Benha University hospital and educational hospital three days/ weeks by rotation from 9:00 AM and extended to 1:00 PM, number of patients taken every day was ranged from 2-3 patients. At the beginning of interview; the researcher welcomed patients, explained the purpose, duration, activity of the study and take their oral approval to participate in the study prior to data collection.

An individual interview was conducted for every patient to collect the necessary data using tools for data collection, the average time needed for (tool 1) to assess demographic data, medical history and knowledge was around 30-45 minutes and about 15-25 minutes for (tool 2) to assess patients' practices regarding hypothyroidism and their effect on patient's health.

Planning phase

The educational protocol was designed by the researcher according to the patients' needs assessment, baseline data obtained from assessment phase and review of relevant of literatures (Timby & Smith, 2017, Hinkle &

Cheever, 2018, Perry, et al., 2019 & Sharma, et al., 2020) to improve the patients' knowledge and practice regarding hypothyroidism. The contents were prepared in simple, clear Arabic language and supplemented by photos and illustrations for better understanding of contents.

Different methods of teaching were used as modified lecture; group discussion and role play, suitable teaching media were included as hand out, to help proper understanding of the content by patients. It was divided into theoretical and practical parts.

- Theoretical part included definition of the thyroid gland, thyroid hormones and thyroid disorders, hypothyroidism, causes, symptoms, risk factors, complications, methods of diagnosis, methods of treatment and methods of prevention of thyroid diseases.
- Practical part included instructions regarding medication intake, eating pattern included allowed and avoided food, instructions about lifestyle regarding sleep pattern, health care and adaptation to stress.

Implementation phase

The implementation phase was achieved through sessions, each session started by a summary of the previous session and objective of the new one. Taking into consideration the use of Arabic language that suits the patients' educational level. Motivation and reinforcement during sessions were used to enhance for the sharing in the study. The studied patients were divided into twelve groups in two hospitals; each group consisted of five patients. The total number of sessions was four sessions, two sessions for theoretical part and two sessions for practical part, these sessions were repeated to each group. It took a period of four months in addition to one month for preprogram for baseline assessment and another one month for post protocol for evaluation.

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Theoretical part as the following.

- **Session one (introductory session):** which included orientation and explanation of reasons, importance of educational protocol; give an explanation about definition of the thyroid gland, thyroid hormones and thyroid disorders.
- **Session two:** which included an explanation about hypothyroidism, causes, symptoms, risk factors, complications, and methods of diagnosis, methods of treatment and methods of prevention of thyroid diseases.

Practical part as the following;

- **Session one:** including instructions regarding medication intake and eating pattern included allowed and avoided food.
- **Session two:** including instructions about lifestyle regarding sleep pattern, health care and adaptation to stress.

Evaluation phase:

Evaluation of the effectiveness of educational protocol on patients' knowledge and practice was done by comparing the results pre and post the implementation of the educational protocol by using the same data collection tool this phase took one month.

Results

Table 1: Shows that, 43.3 % of the studied patients' age ranged from 36–50 years old with the mean age 35.83 ± 8.11 and 88.3% of them were females. Regarding to educational level, 40.0 % of the studied patients had high level of education, 50.0% were employed, 53.3% of them were from rural area and 88.3% of them were married.

Table 2: Shows that, 36.7% of the studied patients had diabetes mellitus, 25% of them had hypertension, , Also, 68.3% of them had previous surgery, 56.1 % of these surgery were caesarian section, 33.3% of them had previous hospitalization, 90.0% of this hospitalization due to surgery and 61.6% were diagnosed from less than five years with the mean 3.41 ± 2.15 .

Figure 1: Illustrates that, 75.0% of the studied patients take 50 mg from thyroxin while 13.3% of them take 25 mg and 11.7 % of them take 100 mg.

Figure 2: Illustrates that, 11.7% of the studied patients had good level of knowledge at pre protocol compared by 68.2% post protocol implementation. While 65.0% of them had poor level of total knowledge at pre protocol compared by 8.3% post protocol implementation.

Figure 3: Illustrates that, 45.0% of the studied patients had satisfactory level regarding their total reported practice pre protocol, compared by 71.7% post protocol implementation. While 55.0 % of the studied patients had unsatisfactory level regarding their total reported practice pre protocol, compared by 28.3% post protocol implementation.

Table 3: Shows that, there were a statistically significant relation between studied patients' reported practice and their age, sex and educational level at pre protocol implementation, $p < 0.05$. While there were a highly statistically significant relation between studied patients' reported practice and their educational level at post protocol implementation, $p < 0.001$. Also, there was a statistically significant relation between studied patients' reported practice and their occupation and residence at post protocol implementation, $p < 0.05$.

Table 4: Shows that, there was no statistically significant relation between total knowledge and their total practice pre protocol and there was a statistically significant relation between studied patients' total knowledge and their total reported practice at post protocol implementation, $p < 0.05$.

Table 5: Shows that, there were a highly statistically significant positive correlation between total knowledge and total practice among studied patients at post protocol implementation, $r = .566$ with $P\text{-value} = .000$.

Table 1: Frequency distribution of studied patients regarding their demographic characteristics (n=60).

Demographic characteristics	no	%
Age /years		
20–35	15	25.0
36–50	26	43.3
51-60	19	31.7
Mean ±SD	35.83±8.11	
Gender		
Male	7	11.7
Female	53	88.3
Educational level		
Can't read and write	6	10.0
Basic education	14	23.3
Secondary education	16	26.7
High level of education	24	40.0
Occupation		
Employed	30	50.0
Unemployed	30	50.0
Residence		
Urban	28	46.7
Rural	32	53.3
Marital status		
Single	7	11.7
Married	53	88.3

Table 2: Frequency distribution of studied patient regarding their past medical history (n=60).

Past medical history	no	%
Associated co –morbidity		
Diabetes mellitus	22	36.7
Hypertension	15	25.0
Liver diseases	0	0.0
Cardiovascular disease	4	6.7
Renal diseases	3	5.0
Immune disease	8	13.3
Previous surgery	41	68.3
Type of surgery (n=41)		
- Appendectomy	10	24.4
- Cesarean	23	56.1
- Hypothyroidism	4	9.8
- Hysterectomy	4	9.8
Previous hospitalization	20	33.3
The reason for hospitalization (n=20).		
- Diabetic coma	4	20.0
- Hypotension	4	20.0
- Surgery	12	60.0
Onset of the diagnosis		
- < 5 years	37	61.6
- 5 - 10 years	19	31.7
- > 10 years	4	6.7

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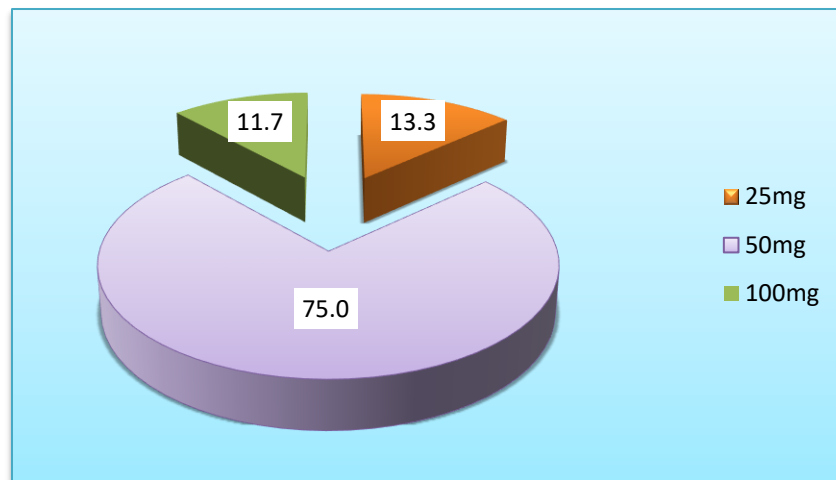


Figure 1: Percentage distribution of studied patient regarding their current dose of thyroxine intake (n=60).

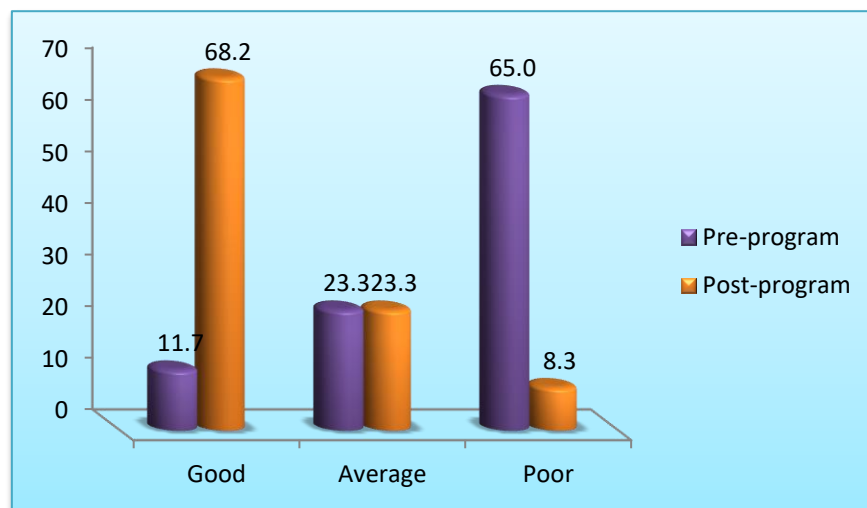


Figure 2: Frequency distribution of studied patients regarding their total knowledge level pre and post protocol (n=60).

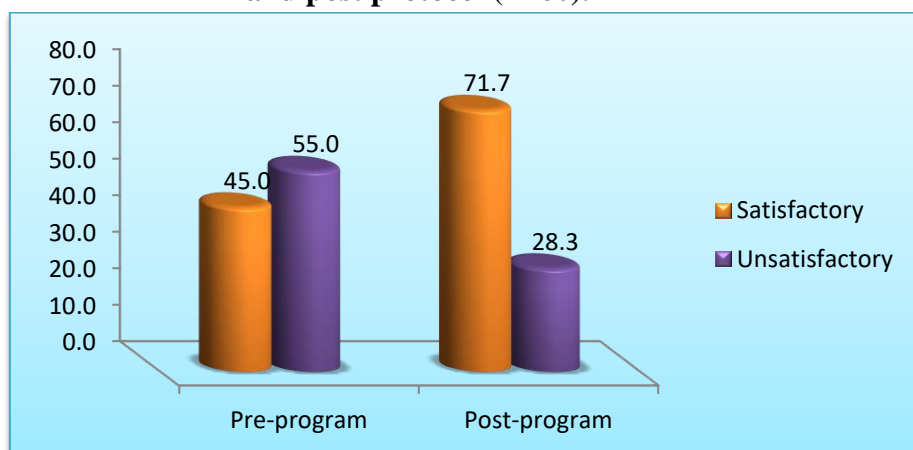


Figure 3: Frequency distribution of studied patients regarding their total reported practices level pre and post protocol (n=60).

Table 3: Relation between studied patients' demographic characteristics and their total knowledge level (n=60).

Items	Pre						X ²	p-value	Post						X ²	p-value
	Poor (n=39)		Average (n=14)		Good (n=7)				Poor (n=5)		Average (n=14)		Good (n=41)			
	no	%	No	%	no	%			no	%	no	%	no	%		
Age																
20–35	9	23.1	5	35.7	1	14.3	3.613	0.461	1	20.0	2	14.3	12	29.3	17.901	.001**
36–50	15	38.5	7	50.0	4	57.1			1	20.0	2	14.3	23	56.1		
51–60	15	38.5	2	14.3	2	28.6			3	60.0	10	71.4	6	14.6		
Gender																
Male	7	17.9	0	0.0	0	0.0	6.52	.038*	1	20.0	2	14.3	4	9.8	0.575	0.75
Female	32	82.1	14	100.0	7	100.0			4	80.0	12	85.7	37	90.2		
Educational level																
Can't read and write	2	5.1	4	28.6	0	0.0	9.584	0.143	4	80.0	0	0.0	2	4.9	32.65	.000**
Basic education	8	20.5	4	28.6	2	28.6			0	0.0	3	21.4	11	26.8		
Secondary education	13	33.3	1	7.1	2	28.6			1	20.0	6	42.9	9	22.0		
High level of education	16	41.0	5	35.7	3	42.9			0	0.0	5	35.7	19	46.3		
Occupation																
Employed	22	56.4	6	42.9	2	28.6	2.212	0.331	4	80.0	7	50.0	19	46.3	2.02	0.364
Unemployed	17	43.6	8	57.1	5	71.4			1	20.0	7	50.0	22	53.7		
Residence																
Urban	19	48.7	5	35.7	4	57.1	1.049	0.592	5	100.0	6	42.9	17	41.5	6.242	.044*
Rural	20	51.3	9	64.3	3	42.9			0	0.0	8	57.1	24	58.5		

A statistical significance differences (p= \leq 0.05*) A highly statistical significance differences(p= \leq 0.001**)

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Table 4: Relation between studied patients' demographic characteristics and their total reported practices pre and post protocol implementation (n=60).

Items	Pre				X ²	p-value	Post				X ²	p-value
	Unsatisfactory (n=33)		Satisfactory (n=27)				Unsatisfactory (n=17)		Satisfactory (n=43)			
	no	%	no	%			no	%	no	%		
Age												
- 20–35	12	36.4	3	11.1	8.664	.013*	6	35.3	9	20.9	1.527	0.466
- 36–50	9	27.3	17	63.0			7	41.2	19	44.2		
- 51–60	12	36.4	7	25.9			4	23.5	15	34.9		
Gender												
Male	0	0.0	7	25.9	9.686	.002*	3	17.6	4	9.3	0.823	0.364
Female	33	100.0	20	74.1			14	82.4	39	90.7		
Educational level												
- Can't read and write	0	0.0	6	22.2	9.158	.027*	6	35.3	0	0.0	17.2	.001**
- Basic education	7	21.2	7	25.9			3	17.6	11	25.6		
- Secondary education	10	30.3	6	22.2			4	23.5	12	27.9		
- High level of education	16	48.5	8	29.6			4	23.5	20	46.5		
Occupation												
- Employed	17	51.5	13	48.1	0.067	0.795	5	29.4	25	58.1	4.022	.045*
- Unemployed	16	48.5	14	51.9			12	70.6	18	41.9		
Residence												
- Urban	14	42.4	14	51.9	0.53	0.466	3	17.6	25	58.1	8.028	.005*
- Rural	19	57.6	13	48.1			14	82.4	18	41.9		
Marital status												
- Single	4	12.1	3	11.1	0.015	0.903	3	17.6	4	9.3	0.823	0.364
- Married	29	87.9	24	88.9			14	82.4	39	90.7		

**A statistical significance differences (p=≤0.05*)
differences (p=≤0.001**)**

A highly statistical significance

Table 5: Statistical relation between total knowledge level and total reported practices among studied patients pre and post protocol (n=60).

Total Knowledge	Patients' reported practices										X ²	p-value		
	Pre				X ²	p-value	Post						X ²	p-value
	Unsatisfactory (n=33)		Satisfactory (n=27)				Unsatisfactory (n=17)		Satisfactory (n=43)					
	no	%	no	%			no	%	no	%				
Poor(n=39)	25	75.8	14	51.9	3.827	0.148	0	0.0	5	11.6	12.46	.002*		
Average (n=14)	5	15.2	9	33.3			4	23.5	10	23.3				
Good (n=7)	3	9.1	4	14.8			13	76.5	28	65.1				

A statistical significance differences (p=≤0.05*) Ahighly statistical significance differences (p=≤0.001)**

Discussion

Creating a culture of civility requires Hypothyroidism has profound impact on health and well-being. Globally, thyroid disorders continue to be common yet one of the most under-diagnosed and neglected chronic health conditions. Patient's knowledge and awareness about the disease and its treatment is very important for good long-term outcome and compliance in any chronic disease (Jammah, 2021). So, this study was conducted to evaluate the effect of an educational protocol on hypothyroidism patients' knowledge and practice.

In the present study, the finding showed that, majority of the studied patients' age ranged from thirty-six to fifty years old with the mean age 35.83±8.11. This result similar with the result of study performed by Alhazmi et al., (2020) which entitled "A cross-sectional study to evaluate knowledge, attitude, and practice among Saudi patients with hypothyroidism in Makkah", who indicated that the majority of participants belonged to the age group between forty-one to fifty years and their main age was 30.4years. From the researcher point of view, that's may be due to that hypothyroidism is

most common at this age more than the young age.

Regarding gender of the studied patients, the results of the current study showed that the majority of the studied patients were female, this result is almost similar to those of Sethi et al., (2018) whom studied knowledge, attitude, and practices in patients with hypothyroidism in India and reported that the majority of the studied population were females. This finding is in disagreement with a study carried out by Khan & Panta (2020) and titled "Knowledge, Awareness and Practice of Patient with Primary Hypothyroidism among the Patient Attending at Endocrinology Care Center" which stated that the majority of the studied samples were male. That's may be attributed to that the hypothyroidism is most common in female than male.

Regarding current dose of thyroxin intake among the studied patients, the present study illustrated that, three quarters of the studied patients take fifty mg from thyroxin, thirteen percent of them take twenty-five mg and eleven percent of them take one hundred mg. Similarly, Wu et al., (2021) listed that the thyroxin dose averaged from fifty to one hundred mg among the study participants.

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That's may be explained by the dose of thyroxine based on thyroid function test results and the patient condition.

Concerning knowledge about hypothyroidism pre and post protocol among the studied patients, the findings of the current study revealed that only less than one fifth of the studied patients had good level of total knowledge at pre protocol which increased to more than two thirds post protocol implementation. While more than one third of them had poor level of total knowledge at pre protocol and then this percentage decreased to less than tenth post protocol implementation.

In the same context, a study conducted by **Mohamed et al., (2019)** to evaluate the impact of implementing nursing guidelines on knowledge and habits of patients receiving radioactive iodine and discussed that the minority of patients with hypothyroidism represented good total knowledge level pre-implementation and the percentage improved to the majority after implementing nursing guidelines.

Also, these results are likely with a study conducted by **Khan et al., (2020)** which reported that marked improvement was seen after the intervention regarding the total level of knowledge and practice about thyroid and hypothyroidism.

Regarding total practice level pre and post protocol among the studied patients, the findings of the current study showed that approximately half of the studied patients had satisfactory level regarding their total reported practices pre protocol, which increased to less than three quarters post protocol implementation. While, more than half of them had unsatisfactory level regarding their total reported practice pre protocol, and then this percentage decreased to more than one quarter post protocol implementation.

This finding is supported with **Hassan & Ahmed (2021)** whose study titled "effectiveness of an educational program

on nurses' knowledge concerning early detection of hypothyroidism/ hyperthyroidism in Baghdad teaching hospitals "who demonstrated that a highly significant difference was found between the study group nurses and patients pre and post application of the educational program with improvement at nurses and patients total practice level regarding hypothyroidism.

On the contrast, **Aladwani, et al., (2019)** at a study conducted in Saudi entitled " A cross-sectional survey to assess knowledge, attitude, and practices in patients with hypothyroidism in Riyadh, Saudi Arabia"the findings indicated lack of knowledge and practice and there is a need for greater public education and awareness in Saudi Arabia to improve the level of knowledge about hypothyroidism among residents of Riyadh.

From the researcher point of view, this can be explained by the fact that improving level of patients knowledge and awareness leading to improvement at their level of practice regarding their medical disease and coping that's mainly increase level of satisfaction regarding total practice level.

Regarding relation between total knowledge level and demographic characteristics among studied patients' pre and post protocol, the findings of the current study demonstrated that there was a statistically significant relation between studied patients' total knowledge and their gender at pre protocol implementation. While, there were a highly statistically significant relation between studied patients' total knowledge and their age and educational level at post protocol implementation. Also, there was a statistically significant relation between studied patients' total knowledge and their residence at post protocol implementation.

In agreement with this result, **Sethiet al., (2018)** stated that significant associations were found between education, age and the levels of knowledge, concern, and precautions taken at the studied patients with hypothyroidism.

This finding is unlikely with **Hassan & Ahmed (2021)** whose reported that there was no correlation between nurse's and patients' knowledge and gender, educational level at equally intervals.

Concerning relation between total reported practices and demographic characteristics among studied patients pre and post protocol, the present study documented that there was a statistically significant relation between studied patients' reported practices and their age, gender and educational level at pre protocol implementation. While, there was a highly statistically significant relation between studied patients' reported practices and their educational level at post protocol implementation. Also, there was a statistically significant relation between studied patients' reported practices and their occupation and residence at post protocol implementation. This finding is congruent with **Hamdoun, (2020)**, who stated that there was an association between demographic data as age, gender and occupation with patients' knowledge, attitude, practice and thereby satisfaction after providing educational guidelines.

Additionally, **Nagendiran et al., (2021)**, showed that there was a statistically significant association between the level of practice and occupation. Also, a statistically significant association was observed in age, monthly income, education, and marital status among the participants with hypothyroidism and their level of practices.

According to relation between total knowledge level and total reported practices among studied patients pre and post protocol, the finding of the current study illustrated that there was a statistically significant relation between studied patients' total knowledge and their total reported practices at post protocol implementation.

The finding is in line with **Hassan & Ahmed (2021)** who revealed that there was a statistically significant relation between studied

patients' total knowledge and their total reported practices at post educational program implementation. From the investigator point of view, that's may be because of improving level of knowledge and awareness regarding hypothyroidism conditions, leading to improvement at the patients' level of practice and applying the needed health requirements effectively.

From all findings of the current study, it can be concluded that was an improvement at level of knowledge and practice regarding hypothyroidism among the studied patients after implementation of educational program compared to pre program implementation. These results are similar with **Mohammed (2019)** who concluded that a statistically significant difference was found at the level of knowledge and practice after educational program with obvious improvement compared with pre-implementation of educational program.

Conclusions:

In the light of the current study findings, it is concluded that the educational protocol had been proved to be significantly effective in improving studied patients' knowledge and practice regarding hypothyroidism.

Recommendations:

- Equip the out-patients' clinics with designed nursing instructions booklet or pamphlets covering all knowledge and instructions related to improving life style of patients with hypothyroidism.
- Orientation programs on mass medias for measuring thyroid function in all adults specially at age of 35 years, more frequent screening every 5 years for high risk or symptomatic individuals.
- Provision of seminars to raise health team personnel' awareness about benefits of the hypothyroidism patient's education for their provision of care.

Effect of An Educational Protocol on Hypothyroidism Patients' Knowledge and Practice

- Further research is needed on a larger probability sample at different settings to generalize the results.

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تأثير بروتوكول تعليمي علي معلومات وممارسات مرضي انخفاض هرمون الغدة الدرقية

وفاء عفيفي عبد العظيم - هبه عبد القادر علي - دعاء محمد محمود

تعتبر اضطرابات الغدة الدرقية من المشكلات الصحية الهامة في جميع أنحاء العالم. انخفاض هرمون الغدة الدرقية هو حالة شائعة من نقص هرمون الغدة الدرقية التي تنتج عن نقص إنتاج هرمون الغدة الدرقية الثيروكسين وثلاثي ثيرونين. تعد معلومات المريض ووعيه بأمراض الغدة الدرقية وعلاجها هامة جداً لتحقيق نتائج جيدة على المدى الطويل. أجريت الدراسة الحالية بهدف تقييم تأثير بروتوكول تعليمي على معلومات وممارسات مرضى انخفاض هرمون الغدة الدرقية. وقد أجريت الدراسة علي ستون مريضاً يعانون من قصور الغدة الدرقية في العيادات الخارجية بمستشفى بنها الجامعي والمستشفى التعليمي التابع لوزارة الصحة ,مصر. وكشفت النتائج علي ان اكثر من ثلث المرضى أعلى مستوى تعليمي مرتفع، نصفهم كانوا موظفين ، وأكثر من نصفهم كانوا من الريف وغالبيتهم كانوا متزوجين. وفقاً لمستوى الممارسات الكلي قبل البرنامج وبعده، كان هناك تحسن ملحوظ في ممارسة المرضى فيما يتعلق بانخفاض هرمون الغدة الدرقية بعد تنفيذ بروتوكول تعليمي مع وجود فرق ذي دلالة إحصائية عالية بين ما قبل وبعد تنفيذ البروتوكول التعليمي. كانت هناك علاقة ذات دلالة إحصائية بين إجمالي المعلومات والممارسات الكلية للمرضى الذين تمت دراستهم في ما بعد تنفيذ البرنامج. ولقد اثبت البروتوكول التعليمي فاعليته في تحسين معلومات وممارسات المرضى المتعلقة بانخفاض هرمون الغدة الدرقية. وتم اقتراح التوصيات الآتية: تزويد العيادات الخارجية بكتيب تعليمات ترميضية تغطي جميع المعلومات والتعليمات المتعلقة بتحسين نمط حياة مرضى انخفاض هرمون الغدة الدرقية. برامج توجيهية على وسائل الاعلام لقياس وظيفة الغدة الدرقية لدى جميع البالغين خاصة من سن 35 عاماً ، وفحص كل 5 سنوات للأفراد ذوي المخاطر العالية أو الذين يعانون من أعراض. تنظيم ندوات لرفع وعي العاملين في الفريق الصحي بفوائد تثقيف مريض انخفاض هرمون الغدة الدرقية من أجل توفير الرعاية لهم.