

Efficacy of Implementing Pre and Postoperative Protocol of Nursing Care on Postthyroidectomy Patients' Clinical Outcomes

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Abstract

Background: Thyroidectomy is a common endocrine surgical procedure. It involves excision a part or all of the thyroid gland. **Aim:** To evaluate the efficacy of implementing pre- and postoperative protocol of nursing care on postthyroidectomy patients' clinical outcomes. **Method, Design:** Quasi experimental study. **Setting:** It conducted in General Surgery Department, Tanta University Education Hospital and Outpatient Surgery Clinic. **Subject:** It consisted of a convenient sample of 60 adult patients selected and divided into 2 equal groups, study group managed by implementing protocol of nursing care and control group received routine nursing hospital care. **Tools:** Three tools used for data collection as follows: **Tool (I)** Postthyroidectomy Patients' Assessment Structured Interview Schedule. **Tool (II)** Postoperative Thyroidectomy Pain Assessment. **Tool (III)** Postthyroidectomy Patients' Clinical Outcomes Assessment: consisted of three parts: Part A was Wound Assessment; Part B was Neck Alteration Assessment; Part C was Postthyroidectomy Complications Observation Checklist **Results:** There were highly statistically significance difference among study group regarding their total knowledge score before and immediately after implementing protocol of nursing care. The current study revealed that the total mean score of Patient Learning Needs Scale was high. In addition, there was highly statistically significance difference between study and control group regarding neck pain. Moreover, there was highly statistically significance difference between study and control group regarding total scores of neck alteration assessment. **Conclusion:** Application of protocol of nursing care had a positive effect on Postthyroidectomy patients' clinical outcomes. **Recommendations:** Application of protocol of nursing care should carry out as a routine care for patients undergoing thyroidectomy.

Keywords: Thyroidectomy, Protocol of nursing care, Clinical outcomes.

Introduction

Thyroid disorders are the most common endocrine diseases in all age groups. The most common type of thyroid disease is goiter, thyroid dysfunction both hyper and hypothyroidism, and thyroid cancer (Gietka C et al 2017). Worldwide, the prevalence of hyperthyroidism ranges from 0.2% to 1.3%. In Europe and the United States, the prevalence of hyperthyroidism is nearly similar (0.7% versus 0.5%). In Australia, the prevalence of hyperthyroidism is lower 0.3%. In Africa, the prevalence is 0.6% and 1.7% of hyperthyroidism and hypothyroidism respectively (Taylor P et al 2018).

Recently in 2020, the American Cancer Society estimates 52,890 new cases (12,720 in men and 40,170 in women), and about 2,180 deaths (1,040 men and 1,140 women) for thyroid cancer in the United States (Moini J et al 2016 and American Cancer Society 2020).

The prevalence of the thyroid dysfunction in different Arab countries ranging from 6.18 to 47.34%. Also, the prevalence of goiter reported by several studies conducted in Arab world, such as Egypt, Algeria, and Bahrain with 25.25, 86 and 1.7%, respectively (Al Shahrani A et al 2016). During the year 2017-2020 about 100 patients were admitted Tanta University Educational Hospital suffering from thyroid diseases (A Statistical Record of Tanta Teaching Hospital In 2020).

Thyroidectomy is a surgical procedure in which is indicated in case of Graves' disease with poor compliance with antithyroid drugs, toxic multinodular goiter, very large goiters, cosmetic deformity, and thyroid cancer. The most common complications include recurrent laryngeal nerve injury, hypoparathyroidism, bleeding, and thyroid storm. In addition, there are several factors that can influence postoperative complications, such as the comorbidities of the patient, type of surgical

treatment done by the surgeon, and the intrinsic factors of the disease as the presence of thyroid malignancy and toxic goiters (Gropper M et .al 2020, Caulley L et .al 2017, and Balentine C et .al 2016).

Preoperative preparation is the first stage in the enhanced recovery. Preoperative nursing care involves orient the patient and explain procedures, measuring vital signs, assess history of an anticoagulant as, it should be discontinued prior to surgery to reduce the risk of hemorrhage, administering the antithyroid medication and iodine preparations and monitor their effect. The patient should have no food or fluids for approximately six to eight hours before surgery (Malley A et .al 2015 and Fischer S et .al 2010).

Nursing responsibilities during the intraoperative phase include continuing the assessment of the patient's physiological and psychological status, promoting safety through verifies the patient's identification bracelet, medical record and the OR schedule. In addition, activities such as monitoring the patient's vital signs, blood oxygenation levels, fluid therapy, and medication transfusion (Sandelin A et .al 2019). Immediate post-anesthesia nursing care focuses on maintaining ventilation and circulation, monitoring oxygenation and level of consciousness, preventing shock, and managing pain. The nurse should assess and document respiratory, circulatory, and neurologic functions frequently (Moyer A et .al 2020). It is a vital nursing role to assess the patient for potential or actual complications following surgery and be aware of the most common complications that can occur in these patients. As early detection and rapid response are key to ensure safe nursing practice and positive patient outcomes (Chan N 2016).

Significance of the study:

Patients who are undergoing thyroidectomy surgery may experience several physical, cognitive, social, and functional problems. Patients commonly experience discomfort in the neck such as neck pain, stress and pressure in the neck, difficulties in movement of the neck, other problems occurred following the surgery are throat dryness, difficulty in swallowing, cough and

hoarseness of voice (Özsoy H 2018). Because of neck pain and difficulties in movement and swallowing are suffered for those patient, nursing role in education and application of exercises to relieve these difficulties are important.

The aim of the study is to:

Evaluate the efficacy of implementing pre- and postoperative protocol of nursing care on postthyroidectomy patients' clinical outcomes.

Research Hypothesis:-

- Postthyroidectomy patients in the study group who exposed to protocol of nursing care exhibit improvement of patients' knowledge than control group.
- Postthyroidectomy patients in the study group who exposed to protocol of nursing care exhibit less neck pain than control group.
- Postthyroidectomy patients in the study group who exposed to protocol of nursing care exhibit reduction in neck dysfunction and discomfort
- Postthyroidectomy patients in the study group who exposed to protocol of nursing care exhibit reduction post thyroidectomy complications than control group

Operational definition:

Clinical Outcomes: - means minimal postoperative neck pain, minimal neck dysfunction and discomfort and reduction of postoperative complications (bleeding, thyroid crisis, hypocalcemia, and wound infection), and decrease length of hospital stay.

Subjects and Methods:

Design: a quasi- experimental was applied.

Setting: The study was conducted in the General Surgery Department, Tanta University Education Hospital and Outpatient Surgery Clinic.

Subjects: The sample of this study was consisted of:

The study included 60 adult patients of both sexes scheduled for thyroidectomy and divided into 2 equal groups, 30 patients in each group.

Group 1; Control group: they were received their routine hospital nursing care.

Group 2; Study group: they were received their protocol of care which was implemented by the researchers; application of breathing exercise, neck stretching exercises, proper use of body mechanics, ice cup absorption in the early postoperative period, and postoperative instruction about wound care, medications, nutrition, and discharge instructions based on patient's needs assessment.

Tools of the study:

The data of the study collected using three tools:

Tool (1) Postthyroidectomy Patients' Assessment Structured Interview Schedule. It will be consisted of five parts as follow:

Part (1): Bio-socio demographic data such as; age, sex, marital status, level of education, and occupation, current diagnosis, body mass index, vital signs and type of operation, date of admission, date of operation, date of discharge.

Part (2): Patient's Knowledge Assessment Tool

It developed by the researchers to assess patient's knowledge regarding Postthyroidectomy. It includes: concept of thyroidectomy, breathing exercise and neck exercises, body mechanics, preoperative preparation, postoperative care, postoperative complications, and discharge instructions

Scoring system

Correct and complete answer	2
Correct and incomplete answer	1
Incorrect and no answer	zero

Part (3): The Patient Learning Needs Scale-

This tool was developed by (Catal E et.al 2008) and modified by the researchers to identify patients' discharge learning needs. The PLNS is a 35-item and classified into 7 subscales including (medications, activities of living, community and follow-up, feeling related to condition, treatment and complications, enhancing quality of life, and skin care). The patients asked to choose the

response that best describes their learning needs and priorities. The total points and each sub-dimension were evaluated separately. On 5-point Likert-type scale the highest and lowest scores of the scale are 175 and 35 points, respectively.

Scoring system:

Not important allocated score	1
Less important allocated score	2
Fairly important allocated score	3
Very important allocated score	4
Extremely important allocated score	5

Part (4):Thyroidectomy Physiological Parameters Assessment Tool

It includes measuring body temperature, heart rate, respiratory rate, and arterial blood pressure.

Part (5): Laboratory Investigations which included: White blood cell count per mm³, total calcium level, phosphorus level, parathormone (PTH) to diagnose postoperative complications.

Tool (II): Postoperative Thyroidectomy Pain Assessment Tool:

It included the following items: - Numerical rating scale, developed by (Farrar J et al 2001) and used to assess postoperative pain intensity. This scale is often displayed as a line numbered from zero to ten asking the person in pain to assign a number, from zero to ten.

Scoring system:

No pain allocated score	0
Mild allocated score	1-3
Moderate allocated score	4-6
Sever allocated score	7-9
Worse allocated score	10

Tool (III): Postthyroidectomy Patients' Clinical Outcomes Assessment Tool:

It developed by the researchers based on extensive recent literature review (Hallgrimsson, P 2014). It used to assess the effect of implementing a protocol of nursing care on clinical outcomes consisted of four parts as the following:

Unlikely storm equal to <25 allocated score 1
Suggests impending storm equal to 25-44 allocated score 2
Highly suggestive of thyroid storm equal to ≥45 allocated score 3

Part (1): Wound Assessment Tool

It developed by the researchers based on extensive literature reviews (Bates-Jensen B et al 2010, Suzuki S et al 2016, Al-Qahtani A et al 2018, Block L 2016, Orstead, H 2010, and Gupta A 2015). It contains four parts which include incision site, wound exudate (type amount, odor), drains, and skin color surrounding wound.

Scoring system of wound status

Well healed allocated score	1-5
Partially healed allocated score	6-16
Poorly healed allocated score	17-22

Part (2): Neck Alteration Assessment Tool

This tool consists of two parts; part one was developed by (Taylor R et .al 2002) and part two developed by the researchers based on extensive recent literature reviews (Atasayar S et .al 2019, Vernon H 2008, and Nam I 2012) to assess the existence of discomfort and dysfunction in the neck after thyroid surgery. It consists of 23- questions. The patients are asked to choose the response that best describes their condition and scored from 1 to 5. On 5-point Likert-type scale; the highest and lowest scores of the scale are 115 and 23 points, respectively.

Scoring system:

Does not apply allocated score	0
Not at all allocated score	1
A little bit allocated score	2
A moderate amount allocated score	3
Quite a bit allocated score	4
A lot allocated score	5

Part (3) Postthyroidectomy Complications Observation Checklist

It was used to assess the presence or absence of signs and symptoms of postoperative complications; thyroid crisis and hypocalcemia. It consisted of two parts as follow:

1- Burch-Wartofsky Point Scale (BWPS)

This tool was developed by (Burch H et .al 1993) and adapted by the researchers to assess the risk for thyrotoxicosis. This scale incorporates a patient's temperature, heart rate, and the presence of atrial fibrillation, congestive heart failure status, gastrointestinal/hepatic symptoms, central

nervous system symptoms, and the presence of a precipitating event.

Scoring system:**2- Hypocalcemia Assessment:**

It was developed by the researchers based on extensive literature reviews (Jiang X et .al 2014, NouredinE S et .al 2014, Alhefdhi A et .al 2013, Baldassarre B et .al 2012). The researchers observe signs and symptoms of hypocalcemia such as decrease total calcium level below 8mg (where as normal 8.5-10.mg/dl), stomach cramp, abdominal pain, numbness and tingling in fingers or toes, positive trousseau's signs, and positive Chvostek's signs.

Scoring system:

Each item observed, categorized, and scored as the following: -

- Presence of signs mentioned equal to score one
- Absence of signs mentioned equal to score zero

Method**I-Administrative process:**

1-An official permission was obtained to conduct this study from the faculty authorities.

2- Ethical consideration:

A-Nature of the study was not causing any harm or pain to the entire sample.

B-Confidentiality and Privacy were taken into consideration regarding data collection.

C-Written consent was obtained from every patient included in the study after explanation of the aim of the study and their right to withdraw from the study at any time.

D- This study was approved from the ethical committee

3- Content validity

All tools were tested for content validity by nine jury of experts in the field of Medical-Surgical Nursing at the faculty of Nursing, surgery field professor at the faculty of Medicine.

4- Reliability of the tool

Reliability of tool (III) Part one: was tested by using Alpha Crombachs factor and the result =0.950.

Reliability of tool (III) Part two: was tested by using Alpha Crombachs factor and the result =0.820.

II-Operational design:

1- Pilot study

It was conducted before the actual study on 6 patients undergoing thyroidectomy after taking their oral approval in order to test the clarity, feasibility, relevance of the tool used, and applicability of the different items of the determinant tools. Modifications and some additional terms were done by the researchers before the main study, according to the experience gained from the pilot study. The patients were excluded from the sample because there were modifications done after conducting pilot study.

2-Field work

- Data were collected over a period of 12 months started from November 2019 to November 2020.
- Each patient was individually interviewed preoperatively and postoperatively in 2 shifts at the morning shift, and the afternoon shift during the period of the study (4 days).

I. Assessment phase: -

- An initial assessment was carried out by the researchers for all the study subjects in both the control and study groups to assess the patients who met the inclusion criteria of this study using Tool (I); Part one throughout the period of the study (4 days) as following:

1- Patient's Knowledge Assessment Tool:

This tool was used to assess and evaluate the patients' knowledge on two phases. First phase (pre implementation protocol of nursing care preoperatively) was used as a baseline data and for both the control and study groups. Second phase (post immediately implementation protocol of nursing care postoperatively) was applied for study groups only.

- #### 2-The Patient Learning Needs Scale:
- It was used to collect data by the researcher to identify patients' discharge learning needs according to the important of the items (48hrs before discharge period) for both the control and study groups.

- #### 3-Thyroidectomy Physiological Parameters Assessment Tool:
- through measuring body temperature, heart rate, respiratory rate, and arterial blood pressure. It was done preoperatively and postoperatively 2 times at the morning shift, and the afternoon shift

through the period of the study (4 days) for both the control and study groups.

- #### 4-Laboratory Investigations:
- Total calcium level, phosphorus level, and parathormone (PTH) level were measured in the cases of total thyroidectomy on the morning of the 2nd postoperative day as normal serum calcium level was 8.4-10.2mg/dL, normal serum PTH level was 14-72pg/mL, normal range for phosphorous is 2.5-4.5 mg/dL. White blood cell count, was done on 4th postoperative day as normal value 4,000 - 11,000 white blood cells per mm³. The blood sample was aseptically aspirated for both the control and study groups.

5-Postoperative Thyroidectomy Pain

Assessment Tool: This tool was used five times of assessment for; 1st, 2nd, and 3rd postoperative day, on discharged, and at the time of suture removal for both the control and study groups.

- #### 6-Wound Assessment Tool:
- The wound was assessed twice, first, in surgical department after drain removal and second, in outpatient clinic at the time of suture removal. At this time, wound care was performed under physician prescribed hospital treatment while applying drain care daily until drain removal. The drain was assessed four times on first postoperative day (immediate postoperative, after 8hrs, after 16hrs, after 24hrs First day), and was continued every 12 hours until drain removal for both the control and study groups.

- #### 7-Neck Alteration Assessment Tool:
- It was used five times; 1st, 2nd and 3rd postoperative day, time of suture removal, and 2 weeks through postoperative period for both the control and study groups.

8- Postthyroidectomy Complications

Observation Checklist: It was used to collect data by the researcher's observations of signs and symptoms of complications such as thyroid crisis and hypocalcemia every day throughout the period of (4 days) for both the control and study groups.

II. Planning Phase:

Designing protocol of nursing care based on assessment of patient's learning needs and patient's goal, priorities and expected outcomes criteria were formulated as improve patient's knowledge, verbalize less neck pain, state feeling of decreased discomfort and

dysfunction of the neck, reduce postoperative complications, reduce length of hospital

In this phase, development of teaching sessions as a part of protocol of nursing care were given for three days (two days preoperatively and one day postoperatively). Health teaching was applied to study group in 5 sessions; each session was taken duration of 20-30 minutes. Teaching method was including: Group discussions, demonstration, and re-demonstration. Also, the teaching media was including: video tape about neck stretching exercise, power point and a colored booklet which were designed by the researcher in Arabic Language and given to the patients as a guideline and reference to get a clear picture of all aspects related to thyroidectomy. The colored booklet covered patient's knowledge regarding thyroid function, brief about thyroid disorder, complications postthyroidectomy, breathing exercise, neck exercises, proper use of body mechanics, nursing care of patients pre and postoperative care, pre-discharge instructions for patients, and follow-up.

III. Implementation phase:

Group (I): Control group

Control group followed the routine hospital nursing care as prescribed by surgical team and consisted of routine preoperative care, routine postoperative care, and routine pharmacological treatment.

Group (II): Study group

Study group was received protocol of nursing care agreed by the treating physicians in surgical units. The contents of the protocol of nursing care was included routine preoperative care, routine postoperative care with special emphasis on postoperative exercises (breathing exercise, neck stretching exercises), ice cup absorption in the early postoperative period, postoperative instruction about wound care, proper use of body mechanics, medications, nutrition, and discharge instructions based on patient's needs assessment.

The following nursing intervention includes the following:

Preoperative nursing care as; preoperative assessment, document patient's history and physical assessment, teaching the patient about breathing and neck exercise (definition, benefits, guidelines and precautions for practice of exercises), the potential

complications, and reassurance the patient about surgical incision.

Immediate preoperative measures as; measuring vital signs, putting on operative gown, administering prescribed preoperative medications.

Immediate postoperative care as; assessment of the patient immediately with focus on airway, breathing, circulation. It also, included checking level of consciousness, measuring vital signs, observation of the drain type, amount of draining discharge and its color, wound site, observation of the intravenous infusions, and patency of IV route.

Postoperative care as; administering the prescribed medications, postoperative position (semi-fowler's position with neutral alignment and support neck), ice cup absorption, postoperative early ambulation, postoperative exercises application, inspection surgical dressing for any bleeding especially at the back of the neck, wound care, drain care, and dietary planning (soft diet).

Postoperative instructions as wound care, proper use of body mechanics, post-surgical radioactive iodine for thyroid cancer patients, personal hygiene, driving, nutrition, warning signs requiring medical care, and follow up visits.

Health teaching implementation

Health teaching was applied to the study group in 5 sessions; each session was 20-30 minutes. The health teaching was designed and presented in Arabic language. At the beginning of the first session, an orientation to the health guideline and its purpose was presented. Each session started by a summary of what had been taught in the previous session and the objectives of the new one, taking into consideration the use of simple language to suit the level of patients. Motivation and reinforcement were used during the educational sessions to enhance learning. The booklets were distributed to the studied patients at the end of sessions. The theoretical part was presented through group discussions, using video tape, booklets, and power point. The practical part was presented through demonstration and re-demonstration.

The content of the session covered the following:

Session 1: "Background information about thyroid function, brief about thyroid

disorder and postthyroidectomy complications”

It was started during second day post admission preoperatively. It focused on the following:

- Program orientation and title expectation,
- An overview of simple anatomy of thyroid gland
- Basic information about thyroidectomy (Definition, types, indications, and complications).

Session 2: - “Breathing exercise and neck exercises”

It was started during second day post admission preoperatively. At the end of this session, the patient was able to perform deep breathing and neck exercise independently. It focused on the following:

- Definition and benefits of exercises.
- Guidelines and precautions for the practice of exercises.
- Techniques of application the exercises.

Techniques of neck exercise

Preoperative

In this phase, neck exercise was taught to all patients in the study group preoperatively. Neck exercise was demonstrated by the researcher and then demonstrated and redemonstrated by the patient until the patient was performing the technique efficiently and correctly. All the treatment sessions were observed and the patients were given feedback.

Postoperatively:

On the 2nd postoperative day, the nursing care included assessment of hemodynamic condition of the patients, measuring the assessment of neck pain, the abilities of the patients to start range of motion and assist him at first. The patient was asked to maintain ideal posture as much as possible, avoid over stretch the muscle, and avoid extended periods of times in the same position, and stop the exercises if feel server pain. The patient was asked to apply neck stretching exercise that was taught to him/her during the preoperative period with colored booklet and videotaping included. The study group was performed neck stretching exercises including five replicates of each stretching exercise three times per day (morning, afternoon, and evening). At the discharge time, the patients have been given booklet and advised with home exercise for 1 month.

1. Flexion/extension: The patient was asked to sit upright in a good posture. Next, the patient was asked to bend the head forwards gently by pulling the chin closer to the chest and hold for a count of 5 then relax. Lastly, the patient was asked to take the head slowly back until looking at the ceiling and hold for a count of 5 then relax.

2. Rotation: The patient was asked to sit upright in a good posture. Next, the patient was asked to turn the head to one side until feeling a stretch and hold for a count of 5 then relax. Lastly, the patient was asked to repeat to the other side

3. Side flexion: The patient was asked to sit upright in a good posture. Next, the patient was asked to keep the head facing forward then tilt the head towards one shoulder without shrugging the shoulder until the patient feel the stretch on the opposite side and hold for a count of 5 then relax. Lastly, the patient was asked to repeat on the other side.

4. Shoulder Shrugs: The patient was asked to sit upright in a good posture. Next, the patient was asked to shrug both shoulders at the same and hold for a count of 5 then relax. Lastly, he patient was asked to return to neutral position.

Session 3: “Postoperative instructions”

It was started during third day post admission preoperatively. It focused on the following:

- Ice cup absorption.
- Techniques of application of drinking water for the first time.
- Preoperative nursing care.
- Immediate preoperative care.
- Immediate postoperative care
- Safe swallowing and voice care.

Teaching method included group discussions. Teaching aids were included power point and colored booklet.

Techniques of application of drinking water for the first time

The patient was asked to sit upright at 80-90° (or as high as tolerated >30°). Next, the patient was asked to drink the entire 3 oz. (90cc) of water from a cup or with a straw, in sequential swallows, and slow and steady but without stopping. Lastly, the patient was assessed for interrupted drinking and coughing or choking during or immediately after completion of drinking.

Session 4: “Proper use of body mechanics”.

It was started during third postoperative day. It focused on the following:

- Definition and benefits of body mechanics.
- Guidelines and precautions for body mechanics.
- Techniques of application of body mechanics.

Teaching method was included group discussions. Teaching aids were included power point and colored booklet.

Session 5: “Discharge instructions”.

It was started during third postoperative day. It focused on the following:

- Postoperative medications and post-surgical radioactive iodine for thyroid cancer patients.
- Warning signs requiring medical care.
- Follow up visits
- Postoperative activities.

IV. Evaluation phase:

- Tool 1 part two was used before and after implementation of protocol of nursing care for study groups and finally a comparison was done between the results of both pre and posttest immediately to evaluate effect of protocol of nursing care on patients' knowledge.
- Evaluation was done for both study and control groups using tools I part three to identify patients' discharge learning needs.
- Evaluation was done for both control and study groups two times on discharge and post-operative first week by using tools II and tools III part one.
- Evaluation was done for both control and study groups three times on discharge and post-operative first week and follow up on postoperative second week by using tools III part two. - Evaluation was done for both control and study groups on discharge using tools I part three and tools III part three.
- Comparison was done between both groups to determine the effect of implementing a protocol of nursing care on clinical outcomes.

Limitations of the Study:

- The change in patient admission at the peak of COVID-19 epidemic (March 2020) that delay data collection and extent the period of data collection.
- There are drop in patient admission because of fear of contacting the virus and reduce outpatient clinic services..

Statistical analysis

- Statistical presentation and analysis of the present study was conducted, using the mean, standard Deviation, paired student t-test, chi-square and Linear Correlation Coefficient [r]tests by SPSS V20.

Results**Table (1): Distribution of studied groups undergoing thyroidectomy according to their socio -demographic data. (n=60).**

It reveals that near half (46.7%) of the study group, and about one third (33.3%) of the control group were in age group of 40-49 years with Mean±SD (40±11.67, 35±25.99) respectively. The majority of the control group and the study group (86.7%, 80% respectively) were females. Also, in relation to educational level, less than half (40%) of the study group were illiterate, and read / write, while near half (46.7%) of the control group were illiterate. Regarding occupation, the majority of the control group and the study group (80%, 70% respectively) were housewives. Finally, in relation to marital status, majority of the control group and the study group (86.7%, 80% respectively) were married.

Figure (1): Shows type of surgery. Half (50%) of the control group and less than half(40%) of the study group had total thyroidectomy.

Figure (2): Shows total knowledge before and immediately after the implementation of the protocol of nursing care. majority (76.7%) of the study group have poor knowledge before implementing the educational protocol compared to (zero %) immediately after implementation of educational protocol of care.

Figure (3): Shows Mean total scores of subscales of discharge learning needs of studied groups. The most important and maximum subscale learning need was related to “skin care” with mean scores for the control group and the study group (83.60±8.87, 81.93±9.05 respectively) and the less important and minimum subscale learning need was related to “feelings related to condition” subscale with mean scores for the control group

and the study group (41.11±20.04, 41.78±21.2205 respectively).

Figure (4): Shows Ranking order of 7 most important discharge learning needs wanted to be informed were; three items of activities of living (food to eat was 100%, post-operative sleep position was 96.66%, starting home tasks was 93.30%), two items of skin care (time allowed for bath was 98.33%, care of surgical incision was 81.66%), one item of enhancing quality of life (impact of illness on life was 75%), and one item medications (time of use of medications was 71.66%).

Figure (5): illustrates distribution of the studied patients undergoing thyroidectomy according to neck pain . more than half (66.7%) of the control group and none (0.0%) of the study group had neck pain at time of suture removal with highly statistical significant differences between them (p value =0.001).

Figure (6): Shows Mean total scores of Neck alteration assessment post implementation of protocol of care for patients undergoing thyroidectomy. the mean total scores of neck alteration assessment post

implementation of protocol of care for patients undergoing thyroidectomy significantly decreased in the study group than in the control group as there was highly statistically significant at 1st, 2nd, 3rd postoperative day, at the time of suture removal, and second week post-operative (p-value < .001).

Table (2): Shows correlation between learning needs score and total knowledge score, there was a negative correlation between total knowledge score and discharge learning needs subscale about skin care before implementation protocol of nursing care.

Table (3): Shows correlation between severities of pain, age, education, neck alteration assessment, the present study demonstrated that, there was a negative correlation between severity of pain and age in all days of assessment. Also, there was a negative correlation between severity of pain and educational level in discharge day and suture removing day. In addition, there was a positive correlation and statistical significance difference between pain severity and neck alteration assessment score.

Table (1): Distribution of studied groups undergoing thyroidectomy according to their socio - demographic data. (n=60).

Variables	Group1 Control group (n=30)		Group2 study group (n=30)		χ^2	P
	N	%	n	%		
Age in years					MCET	0.672
20-29	9	30.1	7	23.3		
30-39	4	13.3	2	6.7		
40-49	10	33.3	14	46.7		
50-60	7	23.3	7	23.3		
Mean±SD	40±11.67		35±25.99			
Sex:					0.480	0.488
Males	4	13.3	6	20.0		
Females	26	86.7	24	80.0		
Educational level:					1.240	0.538
Illiterate	14	46.7	12	40.0		
Read & write	8	26.7	12	40.0		
Secondary	8	26.7	6	20.0		
Occupation:					MCET	0.407
Housewife	24	80.0	21	70.0		
Employee	3	10.0	2	6.7		
Farmer	0	0.0	2	6.7		
Manual worker	3	10.0	5	16.7		
Marital status:					MCET	0.481
Single	2	6.7	1	3.3		
Married	26	86.7	24	80.0		
Divorced	0	0.0	3	10.0		
Widow	2	6.7	2	6.7		

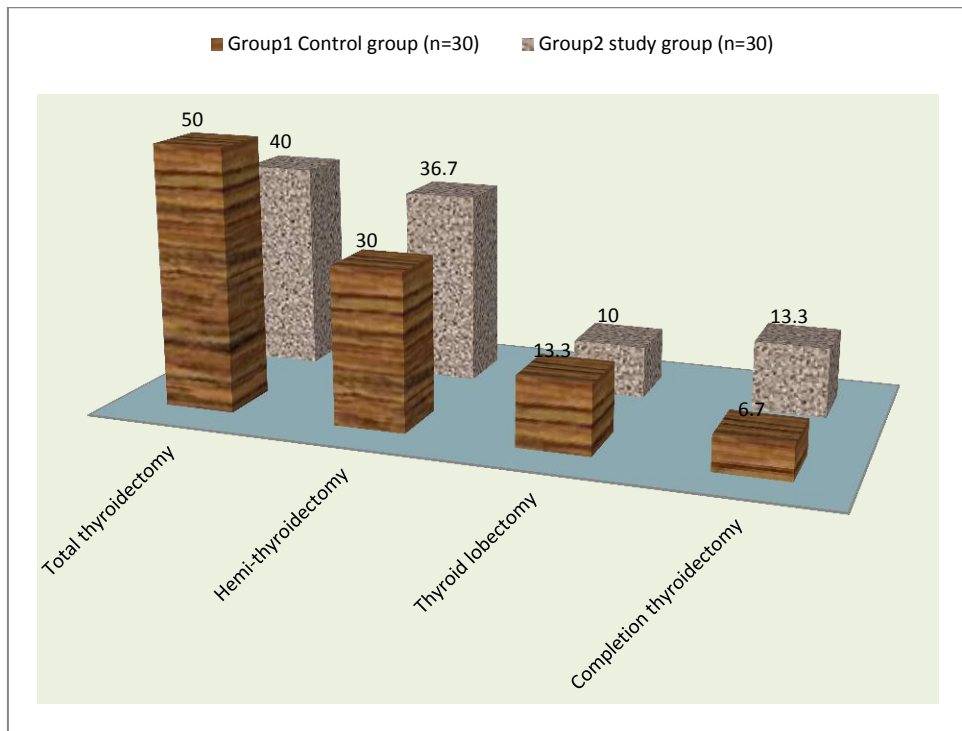


Figure (1): Distribution of studied groups undergoing thyroidectomy according to type of surgery (n=60)

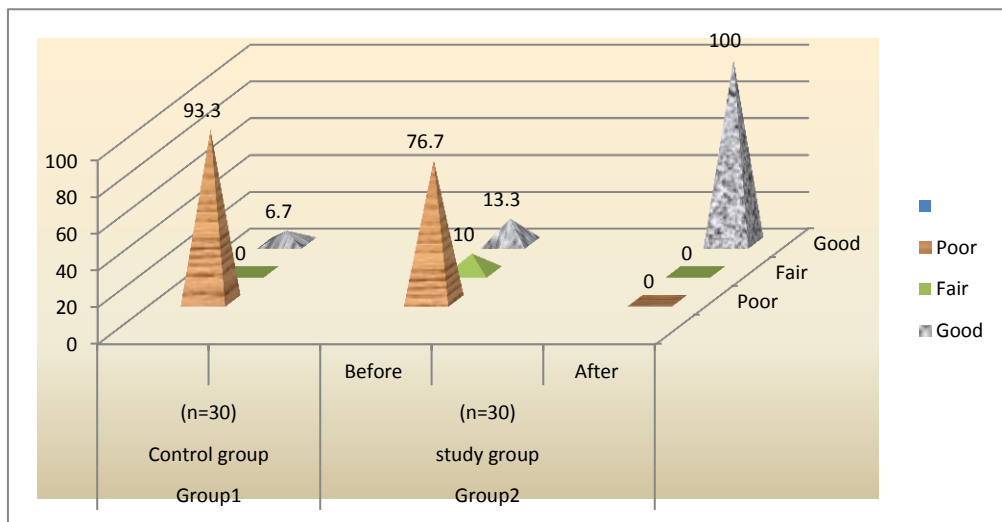


Figure (2): Distribution of studied groups' total knowledge before and immediately after the implementation of the protocol of nursing care (n=60).

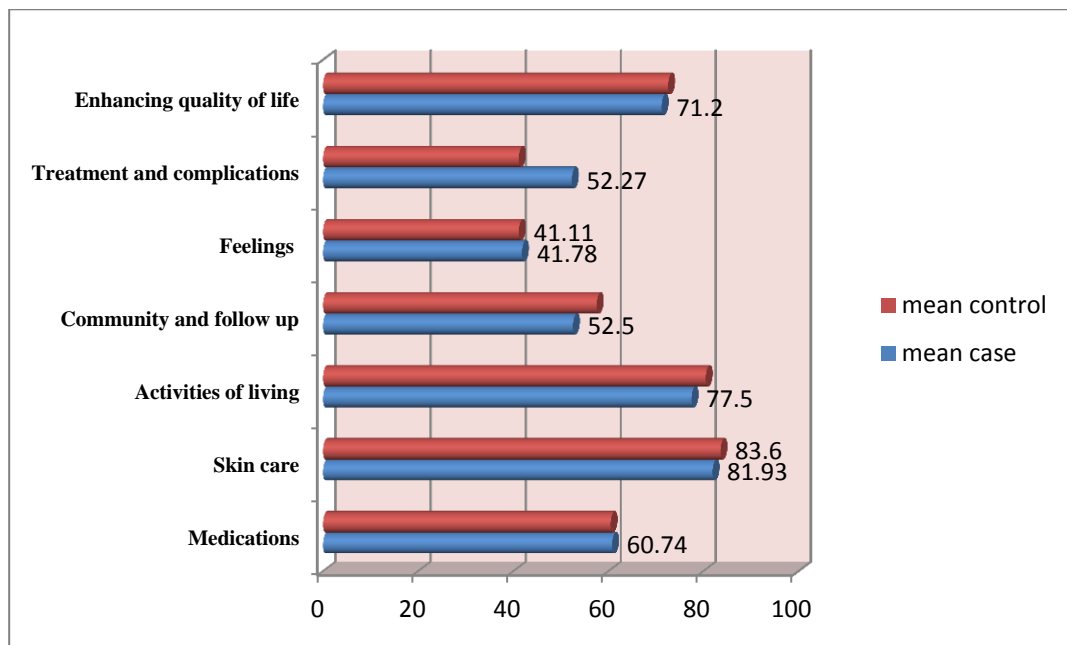


Figure (3): Mean total scores of subscales of discharge learning needs of studied groups.

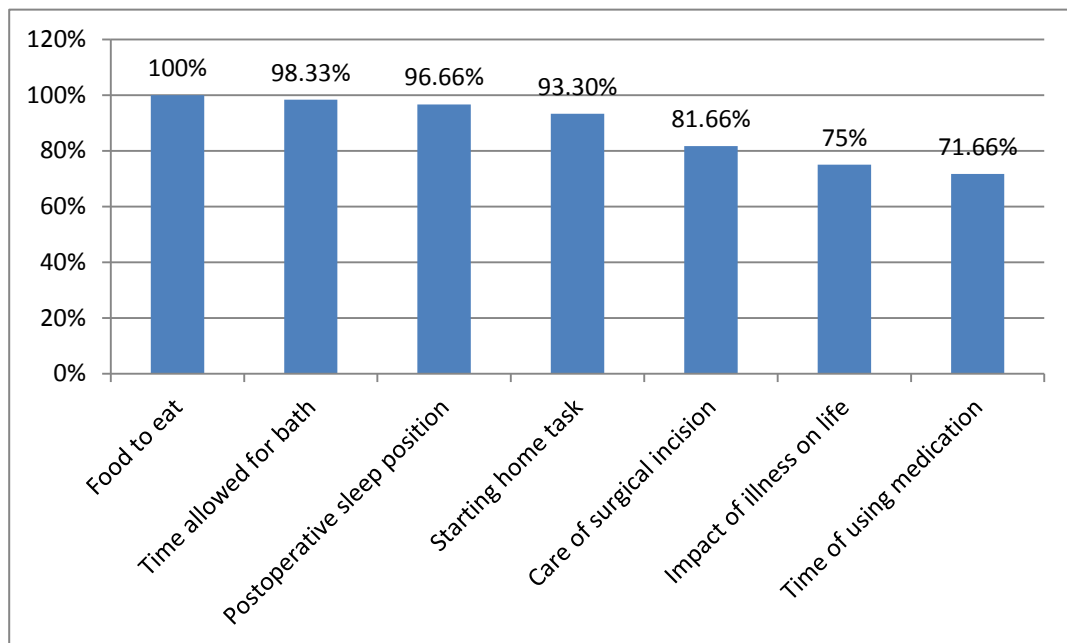


Figure (4): Ranking order of 7 most important discharge learning needs of patients undergoing thyroidectomy according to type of surgery (n=60).

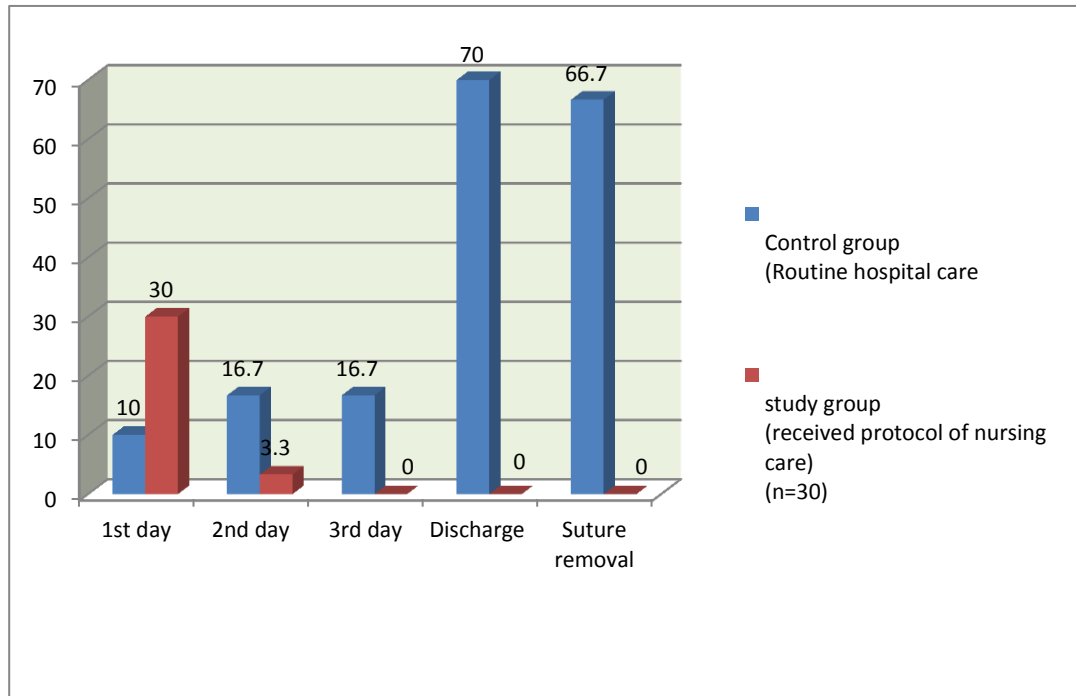


Figure (5): Distribution of the studied patients undergoing thyroidectomy according to neck pain (n=60).

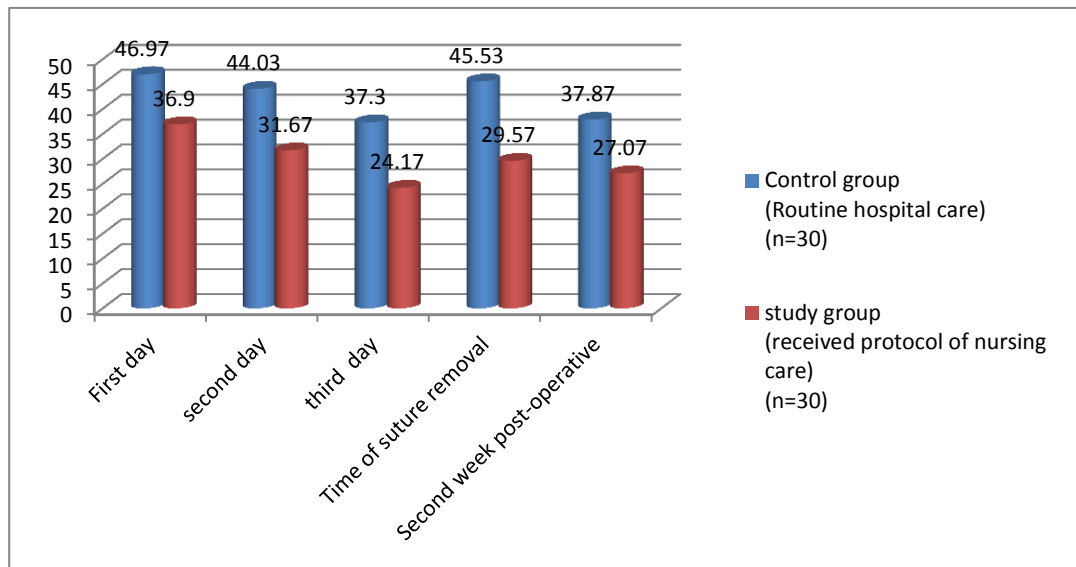


Figure (6): Mean total scores of Neck alteration assessment post implementation of protocol of care for patients undergoing thyroidectomy (n=60).

Table (2): Correlation between discharge learning needs score and total knowledge score of patients undergoing thyroidectomy.

Discharge learning needs score	Total knowledge score before		Total knowledge score after	
	R	P	r	P
Medications	0.467	0.001*	0.205	0.278
Activities of life	0.104	0.427	0.196	0.300
Community and follow up	0.033	0.803	0.603	0.001*
Feelings related to condition	0.189	0.147	0.290	0.120
Treatment and complications	0.016	0.906	0.523	0.003*
Enhancing quality of life	0.361	0.005*	0.592	0.001*
Skin care	-0.091	0.493	0.263	0.169

Table (3): Correlation between severity of pain and(age, education, neck alteration assessment)of patients undergoing thyroidectomy.

Variables	Pain severity									
	Day 1		Day 2		Day 3		Discharge Day		Suture removing Day	
	rho	P	rho	p	rho	p	Rho	P	rho	p
Age	-0.139	0.290	-0.144	0.274	-0.269	0.038*	-0.200	0.126	-0.182	0.165
Educational level	0.110	0.402	-0.019	0.885	0.028	0.834	-0.082	0.536	-0.030	0.820
Neck alteration assessment score	0.265	0.040*	0.464	0.001*	0.671	0.001*	0.792	0.001*	0.843	0.001*

Discussion

After thyroidectomy ,patients complain many physical, social, and emotional problems that affect their life style. so the perioperative care given by the nurse should cover the comprehensive needs of the patient, improving the patient's confidence to face surgery, and return to regular life activities.

The findings of the present study revealed that near half of the study group, and about one third of the control group ranged in the age between 40-49 years. This may be interpreted that thyroid disorders are very common in middle-aged and older adults.

This finding was in agreement with Asban et .al (2020),who found that the mean age of studied patients were 44 ± 15 years. **As regard to sex,** the present study showed that the majority of both group patients were females. This may be interpreted that thyroid disorders are very common in females than males. This result was similar with **Gut et al. (2020),** who reported that most patients undergoing thyroidectomy were female. **In relation to educational level,** this study revealed that less than half of the study group and near half of the control group were illiterate. This finding was accepted with **Ali et al. (2020),** who noted that majority of studied patients were illiterate. This finding of the present study contradicted with **Ibrahim**

(2019), who found more than half of studied patients were educated **Moreover, in the current study,** majority of the control group and the study group were housewife. This result may be due to the fact that most of the studied patients are females. This finding was supported with **Gezer et .al (2019),** who proved that more than half of the subjects in both group patients were housewives. Nurses to brainstorm ideas and examining problems from various perspectives.

Regarding levels of the total preoperative, postoperative, and discharge knowledge, the finding of the present study revealed that majority of the study group have poor knowledge before implementing protocol of nursing care compared to no one immediately after implementation protocol of nursing care. Also, this study showed that there was a significant difference between the study group pre and post protocol of care. The enhancement in patients' knowledge score due to active involvement of patients in session and frequent review of knowledge. In addition, patients in the present study were interested in education and have an active role during implementation protocol of nursing care. Also, the enhancement in patients' knowledge score due to content of educational protocol of care based on patients' learning needs before discharge, its clarity and simplicity, using of

audiovisual aids and the availability of the researcher in the field for more clarification, and frequent repetition to fix the knowledge.

Regarding discharge learning needs, the findings of the current study revealed that the total mean score of Patient Learning Needs Scale PLNS was high. Due to patients are lacking knowledge, and therefore are in need for information that might help patients' participation in achieving successful outcomes of the treatment plan. This finding agreed with many studies which showed that the total mean score of PLNS of patients was high⁽⁴⁷⁻⁴⁹⁾. **Furthermore, in the current study** the most 7 important ranking order of learning needs which patients wanted to be informed were activities of living subscale (three items), skin care subscale (two items), enhancing quality of life subscale (one item), and medications subscale (one item) respectively. This result was in line with the other study result⁽⁵⁰⁾, which reported the most PLNS items for which patients wanted to be informed were treatment and complications subscale (two items), medications subscale (two item), and enhancing quality of life subscale (one item) respectively.

Regarding pain assessment, the finding of the current study revealed that **in the first day after surgery**, the majority of patients experienced sore throat pain. This may be interpreted that all surgical procedures using general anesthesia the patients experience pain in the throat due to intubation however, patients who underwent thyroidectomy surgeries experienced more intense pain in the throat due to the location of the surgical site lying next to the larynx, pharynx, and trachea⁽⁵¹⁾.

In 2nd postoperative day, more than half of the control group and minority of the study group had sore throat. This finding is justified by the effect of using ice cube absorption in the early postoperative period after the physician requested that patients taken it orally and their intestinal movements began. In addition, there was a significant difference between the control and study group in relation to sore throat pain, it can be proven that application of ice cube absorption as a part of protocol of nursing care is effective in reducing sore throat pain. **This result was in line with Zaman et. al (2020)**, who found pain scores of the patients in cold vapor group were found to be significantly lower than the other group. This finding was supported with **Sahbaz et al. (2020)**⁽⁵³⁾, who found ice cube absorption

was effective in reducing sore throat pain. On the other hand, this result was disagreed by **Bulut et al. (2016)**, who reported that cold vapor did not have an effect on sore throat on its own; however, it decreased hoarseness and swallowing difficulties when applied together with oxygen.

As regarding neck alteration assessment, the finding of this study revealed that mean total scores of neck alteration assessment post implementation of protocol of care for patients undergoing thyroidectomy significantly decreased in the study group than in the control group as there was highly statistically significant at 1st, 2nd, 3rd postoperative day, at the time of suture removal, and second week post-operative (p-value < .001). It can be explained due to the patients are encouraged preoperatively to practice five replicates of every stretching exercise three times daily as well as the patients practice these exercises on second postoperative day and advised home exercise for one month. Also, this improvement might be related to several reasons; application protocol of nursing care such as application of breathing exercises, proper use of body mechanics, application ice cup absorption, providing the patient with colored booklet, using audiovisual aid, using video tape, frequent demonstration and redemonstration. Finally, from the same result, it can be proven that application protocol of nursing care is effective in reduction neck discomfort. **It supports the research hypothesis.**

Regarding correlation between learning needs score and total knowledge score, there was a negative correlation between total knowledge score and discharge learning needs subscale about skin care before implementation of protocol of nursing care. Due to patients are lacking knowledge, and therefore are in need for information that might help patients' participation in achieving successful outcomes of the treatment plan. This justification go in line with **Seo et al. (2016)**, who reported the level of learning needs was high, whereas, that of knowledge was low.

Regarding correlation between severity of pain, age, education, neck alteration assessment, the present study demonstrated that, there was a negative correlation between severity of pain and age in all days of assessment. These findings disagreed by **Ertürk et.al (2018)**, who reported that pain increased with increasing age as young

people's having expectations from life and plans for the future, and old people have physical disorders (such as hypertension and diabetes mellitus) and become frail. Also, there was a negative correlation between severity of pain and educational level in discharge day and suture removing day. This finding agreed by **Grodsky et al. (2020)**, who reported that greater levels of education are associated with less pain.

There was a positive correlation and statistical significance difference between pain severity and neck alteration assessment score. This may related to application of protocol of nursing care. These findings agreed by **Ayhan et al. (2016)**, who investigated the effect of neck stretching exercises after total thyroidectomy on neck pain and disability and reported a statistically significant reduction in pain and disability. Also, these findings agreed by **Bhavani (2019)**, who revealed that applying neck stretching exercises significantly improved the neck condition concerning neck pain and disability one week after total thyroidectomy. Patient compliance with a range of motion exercises significantly improves neck movement in order to be able to carry out daily life activities and reducing pain for the study group in comparison with the control group. maintain safe, satisfied, calm and enthusiastic work environment. They practice listening skills for understanding, reframing the causes of existed conflict among ICU nurses. Really head nurse understand how conflict develops and how to interact with all parties to discover effective solutions.

Therefore, analyses of the current study findings have generally revealed the efficacy of implementing protocol of nursing care lead to reducing the level of pain, neck dysfunction and discomfort.

Conclusion

Implementation of protocol of nursing care proposed by the researcher; {application of breathing exercise, neck stretching exercises, proper use of body mechanics, ice cup absorption in the early postoperative period, and postoperative instruction about (wound care, medications, nutrition, and discharge instructions) based on patient's needs assessment}.has positive effect on

clinical outcomes as statistically significant improvements in patients' knowledge, less pain level, and less neck dysfunction and discomfort among study group patients than routine nursing hospital care among control group.

Recommendations:

Up on the completion of this study, it can recommend that:

Based on the findings of the current study, the following recommendations can be suggested

1. Recommendation for clinical practice

- Protocol of nursing care should be carried out as a routine care for patients undergoing thyroidectomy in the general surgery department.

2. Recommendations for education and training

- Develop an in service audiovisual materials training/education about thyroid gland and thyroid disorders and radioactive iodine therapy before, during and after procedure for patients.
- The neck range of motion exercises for the patients undergoing thyroidectomy can be included in the nursing curriculum.

3. Recommendations for further research studies:-

- Further studies are needed to increase follow up period for postthyroidectomy patients
- The study should be replicated on large sample and different hospitals setting in order to generalize the results.
- Identification of Patients at High Risk for Postsurgical Hypoparathyroidism.
- Assessment of Nurses' Performance for Patients Undergoing Thyroidectomy.
- Assessment of Patients' Nutritional Needs Post Thyroidectomy.
- Effect of Nursing Instructions on Life Style of Patients Receiving Radioactive Iodine Therapy for Thyroid Disorders.

n all adults beginning at age 35 years and every 5 years thereafter, noting that more frequent screening may be appropriate in high risk or symptomatic individuals.

4. Recommendations for further research studies:-

- Further studies are needed to increase follow up period for postthyroidectomy patients

- The study should be replicated on large sample and different hospitals setting in order to generalize the results.

References:

A Statistical Record of Tanta Teaching Hospital in 2020.

- Abd-El Fattah H.** Assessment of Patients' Knowledge, Needs and Problems among Patients Undergoing Radioactive Iodine at Cairo University Hospitals. Unpublished Doctorate Thesis, Faculty of Nursing, Cairo University. Egypt.2014.
- Al Shahrani A, El-Metwally A, Al-Surimi K, et al.** The Epidemiology of Thyroid Diseases in the Arab World: A Systematic Review. *Journal of Public Health and Epidemiology* .2017; 8(2):17-26.
- Algaid S, Mohammad Z, and Abd-El Mohsen S.** Effect of Nursing Instructions on Life Style of Patients Receiving Radioactive Iodine Therapy for Thyroid Disorders. *Assiut Scientific Nursing Journal*.2019; 7 (17): 33-41.
- Alhefdhi A, Mazeh H, and Chen H.** Role of Postoperative Vitamin D and/or Calcium Routine Supplementation in Preventing Hypocalcemia After Thyroidectomy: A Systematic Review and Meta-Analysis. *Oncologist* .2013; 18(1):533–542.
- Ali R, Elsayed W, and Mohamed R.** Quality of Life of Differentiated Thyroid Cancer Survivors On/Off Treatment with Eltroxin, Sohag, Egypt. *The Egyptian Journal of Community Medicine*.2020; 38 :(3)30-38.
- Al-Qahtani A, Abouzeid A, and Osman T.** Could post-thyroidectomy bleeding is the clue to modify the concept of postoperative drainage? A prospective randomized controlled study. *Asian Journal of Surgery*, 2018; 41(1): 511-516.
- American Cancer Society:** Key Statistics for Thyroid Cancer. Last Medical Review March 14, 2019 Last Revised: January 8, 2020.
<https://www.cancer.org/cancer/thyroid-cancer/about/key-statistics.html>.
- Asban A, Anue A, Xie R et al .** Increasing Use of Thyroidectomy as Definitive Treatment for Hyperthyroidism. *Journal of Surgical Research* . 2020; 246 :(1) 435-441.
- Atasayar S, and Demir S.** Determination of the Problems Experienced by Patients Post-Thyroidectomy. *The Journal of Clinical Nursing* .2019; 28(5):1-21.
- Ayhan H, Tastan S, Iyigun E, et al.** The effectiveness of the neck exercises following total thyroidectomy on reducing neck pain and disability Randomized controlled trial *Cancer Nursing*. 2016; 13 (3) :224-31.
- Baldassarre B, Chang D, and Brumund K.** Predictors of Hypocalcemia after Thyroidectomy: Results from the Nationwide Inpatient Sample. *ISRN Surgry*. 2012; 2012 (1): 338-614.
- Balentine C, and Sippelr S.** Outpatient Thyroidectomy: Is It Safe? *Surgical Oncology Clinics of North America* .2016; 25(1):61–75.
- Bates-Jensen B, Harris C, Parslow N, et al.** Bates-Jensen wound assessment tool: pictorial guide validation project. *Journal of Wound, Ostomy and Continence Nursing*. 2010; 37(3):253-9.
- Bhavani D, Monisha R, and Kamalanathan P.** Evaluating the Effects of Neck Exercise on Post Thyroidectomy Patients- A Pilot Study. *Indian Journal of Public Health Research and Development*. 2019; 10(8): 79-81.
- Block L.** Mapping Nursing Wound Care Data Elements to Snomed-Ct. Master of Science in Nursing. The Faculty of Graduate and Postdoctoral Studies. The University of British Columbia.2016.
- Bulut H, Erden S, Demir SG, et al.** The effect of cold vapor applied for sore throat in the early postoperative period. *The Journal of PeriAnesthesia Nursing*. 2016; 31 (4):291-297.
- Burch H, and Wartofsky L.** Life-threatening thyrotoxicosis. Thyroid storm. *Endocrinol Metab Clin North Am*. 1993; 22(2):263-277.
- Catal E and Dicle A.** A validity and reliability study of the patient learning needs scale in Turkey. *Dokuz Eylul Uni School Nuring Electronical Journal*. 2008; 1 (1):19-32.
- Caulley L, Johnson S, Luo L, et al.** Risk Factors for Postoperative Complications in Total Thyroidectomy. *Medicine*. 2017; 96(5):6–10.
- Chan N.** Anesthesia Management of Total Thyroidectomy Using a NIM EMG

- Endotracheal Tube: A Case Report .General Practice Journal.2016; 4(2): 248-250.
- Christoforides C, Dionigi G, and Vasileiou I.** A Historical Account for Thyroid Surgery. Journal of Endocrine Surgery. 2018; 18 :(1) 1-9.
- Diab N, Daya N, Juraschek S ,et al.** Prevalence and Risk Factors of Thyroid Dysfunction in Older Adults in the Community. Scientific Reports.2019; 9 :(1) 13-56.
- Ertürk E and Ünlü H.** Effects of pre-operative individualized education on anxiety and pain severity in patients following open-heart surgery. International Journal of Health Sciences. 2018; 12 (4):26-34.
- Farrar J, Young J, Lamoreaux L, et al.** Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. Pain. 2001; 94:149–158.
- Ferrés C, Martos I, Navarrete N, et al.** Main care to avoid complications associated with thyroidectomy. International Journal of Community & Family Medicine. 2019; 3 :(5) 227-234.
- Fischer S, Bader A, and Sweitzer B.** Preoperative Evaluation, In Anesthesia. Philadelphia: Churchill Livingstone, Current Opinion in Anesthesiology2010; 21(6):711-8.
- Sandelin A, Kalman S, and Gustafsson B.**Prerequisites for safe intraoperative nursing care and teamwork—Operating theatre nurses’ perspectives: A qualitative interview study . Journal of Clinical Nursing. 2019; 28(14): 2635-2643
- Gezer D, and Arslan S.** The Effect of Education on the Anxiety Level of Patients before Thyroidectomy. Journal of PeriAnesthesia Nursing.2019; 34 :(2) 265-271.
- Gietka C,and zernel M.** The thyroid gland in postmenopausal women: physiology and diseases. Przegląd Menopauzalny. 2017; 16(2):33-37.
- Grodsky E, Rogers G, Zajacova A.**The Relationship between Education and Pain among Adults Aged 30–49 in the United States.The Journal of Pain.2020; 21 (11):1270-12802.
- Gropper M.** Miller's Anesthesia: Anesthetic Implications of Concurrent Diseases. 9th ed. Philadelphia: Elsevier Inc., 2020: 999-1064.
- Gupta A, Pramod A, and Kumar P.** Assessment of the histological state of the healing wound. Plastic and Aesthetic Research .2015; 2 (5): 239-242.
- Güven B , Ibrahimoglu O , and Elbuken B.** Learning Needs of Patients and Their Caregivers After Ambulatory Surgery, Journal of PeriAnesthesia Nursing.2020; 35 (3): 283-287.
- Hallgrimsson, P.** Clinical problems in thyroid surgery. Department of Surgery, Clinical Sciences Lund, Lund University.2014.
- Hamdan F, and Al-Momani I.** Jordanian nurses and acute myocardial infarction patients' perceptions about learning needs. Global Journal of Medical, Physical and Health Education 2015; 3(1):85–99.
- Ibrahim A.** Effect of Health Teaching Handouts on Patient’s Outcomes Who Undergoing Thyroidectomy in General Surgical Department at Mansura University Hospitals. Unpublished Thesis. Master’s Degree. Mansura University.2019.
- James M, Rod F, Graeme H, et al.**Rang & Dale's Pharmacology: The Thyroid.9th ed. China: Elsevier Ltd., 2020:448-454.
- Jang J, Chang Y, and Kim E.** Early neck exercises to reduce postthyroidectomy syndrome after uncomplicated thyroid surgery: A prospective randomized study. Journal of Korean Thyroid Association.2014; 7(1): 70-6.
- Jiang X, Gao B, ZOUJ, et al.** Perioperative nursing and intervention of postoperative complications for thyroidectomy. Acta Medica Mediterranea. 2014; 30(1): 355-366.
- Malley A, Kenner C, Kim T, and Blakeney B.** The role of the nurse and the preoperative assessment in patient transitions. *AORN J.* 2015;102(2):181.e1-181.e1819. doi:10.1016/j.aorn.2015.06.004
- Moini J, Pereira K, and Samsam M.** Epidemiology of Thyroid Disorders: Global Impact of Thyroid Disorders.1st ed. Philadelphia: Elsevier Inc., 2020: 243-256.
- Mosleh S, Eshah N, and Almalik M.** Perceived learning needs according to patients who have undergone major coronary interventions and their nurses. Journal of Clinical Nursing. 2017; 26 (3):418-426.

- Moyer A and Naglieri C.** Current Diagnosis & Treatment: Postoperative Care. 15th. McGraw Hill; United States of America 2020.
- Nam I, Bae J, Shim, M, et al.** The importance of preoperative laryngeal examination before thyroidectomy and the usefulness of a voice questionnaire in screening. *World Journal of Surgery.* 2012; 36(2):303-309.
- NoureddinE S, Genthner D, and Lopez M.** Early Predictors of Hypocalcemia after Total Thyroidectomy an Analysis of 304 Patients Using a Short-Stay Monitoring Protocol. *JAMA Otolaryngol Head Neck Surgery.* 2014; 140(11):1006-1013.
- Orstead H.** Best practice recommendations for the prevention and management of open surgical wounds. *Wound Care Canada.* 2010; 8(1): 6 – 34.
- Özsoy H.** The Effect of Cold Steam Application on Sore Throat in Patients Intubated Postoperatively. Adnan Menderes University Institute of Health Sciences, Master Thesis, Aydin, 2018 (In Turkish).
- Phil P.** Current concepts in muscle stretching for exercise and rehabilitation. *International Journal of Sports Physical Therapy.* 2012; 7(1): 109–119.
- Polat S, Celik S, Erkan H, et al.** Identification of learning needs of patients hospitalized at a University Hospital. *Pakistan Journal of Medical Sciences.* 2014; 30 (6):1253-1258.
- Sahbaz M, and Khorshid L.** The Effect of Cold Vapor and Ice Cube Absorption in the Early Postoperative Period on Sore Throat and Hoarseness Induced by Intubation, *Journal of PeriAnesthesia Nursing,* 2020; 35 (5):1-7.
- Sahli Z, Najafian A, Kahan S, et al.** One-Hour Postoperative Parathyroid Hormone Levels Do Not Reliably Predict Hypocalcemia After Thyroidectomy. *World Journal of Surgery.* 2019; 42 :(7) 2128-2133.
- Seo M, and Choi E.** Knowledge and learning needs related to cancer treatment in gynecological cancer patients. *Taehan Kanho Hakhoe Chi.* 2016; 36 :(6) 942-9.
- Shehata M, Mohammed I, and EL Haddad A.** The need to give calcium supplementation after total thyroidectomy. *Al-Azhar International Medical Journal .*2020; 1 :(2) 252-257.
- Suzuki S, Yasunaga H, and Fushimi K.** Factors Associated with Neck Hematoma After Thyroidectomy. A Retrospective Analysis Using a Japanese Inpatient Database. *Medicine (Baltimore) .*2016; 95(7): 2812-2814.
- Takamura Y, Miyauchi A, Tomoda C, et al.** Stretching exercises to reduce symptoms of postoperative neck discomfort after thyroid surgery: prospective randomized study. *World Journal of Surgery.* 2005; 29(6): 775-79.
- Taylor P, Albrecht D, and Scholz A.** Global Epidemiology of Hyperthyroidism and Hypothyroidism. *Nature Reviews Endocrinology.* 2018; 14(5):1-10.
- Taylor R, Chepeha J, Teknos T, et al.** Development and validation of the neck dissection impairment index: a quality of life measure. *Archives of Otolaryngology - Head and Neck Surgery.* 2002; 128(1):44–9.
- Temiz Z, Ozturk D, Ugras G, et.al.** Determination of Patient Learning Needs after Thyroidectomy. *Asian Pacific Journal of Cancer Prevention.* 2016; 17(3):1479-1483.
- Vernon H.** **The neck disability index:** State – of-the-art, 1991-2008. *The Journal of Manipulative and Physiological Therapeutics.* 2008; 31(17): 491–502.
- Zaman F, and Karahan E.** The Effect of Cold Vapor Treated to Thyroidectomy Patients During Early Postoperative Period *Eastern Journal of Medicine .*2020; 25 (1):118-125.