

Effect of Neck Stretching Exercises on Patient' Neck Disability and Pain Thyroidectomy

Zeinab Mohamed Ahmed Mohamed

Lecturer of Medical Surgical Nursing, Faculty of Nursing, Zagazig University.

e-mail:zeinabdreams2000@yahoo.com

Abstract

Background: Diseases related to the thyroid gland are one of the greatest often seen endocrine diseases across the world. Total thyroidectomy is presently the favoured treatment for several thyroid disorders. **The aim of study aimed to** assess effect of neck stretching exercises on patients' neck disability and pain after thyroidectomy. **Design:** This study used quasi experimental design. **Setting:** the study was performed at Zagazig university hospital's general surgery ward and outpatient surgery clinic. **Subjects:** Participants were randomly assigned to one group: stretching exercise (n= 38) or control exercise (n= 38). **Tools:** Three methods were implemented: 1) a Patient assessment sheet, 2) a visual analogue scale for pain, and 3) an index of neck disability. **Results:** Both groups had significant differences in neck's disability and pain after 7- and 30-days following thyroidectomy. **Conclusion:** Neck stretching exercise was effective in diminishing the patient's neck disability and pain following thyroidectomy. **Recommendation:** Conducting further studies on extra samples from participants in several hospitals in various governorates are recommended.

Keywords: Neck Stretching Exercises, Neck Pain, Neck Disability & Thyroidectomy.

Introduction:

Thyroid surgery is the desired treatment when goitre, thyroid carcinoma, hyperthyroidism, or solitary thyroid nodules are diagnosed. When thyroid carcinoma and nodules with the potential for cancer are diagnosed, a complete thyroidectomy is favoured (Ayhan et al., 2016).

Complete thyroidectomy is a surgical procedure that requires entirely removing the thyroid gland. A near-complete thyroidectomy is a process in which both thyroid lobes are surgically separated excepting a minor part of thyroid tissue on either 1- or both sides <1.0 mL. Sub-complete thyroidectomy leaving 3 to 5 g of

the thyroid gland on the less influenced side (Cirocchi et al., 2015).

Thyroidectomy is one of the essential frequently implemented surgical procedures internationally. In 2016, over 34,000 thyroid surgeries were implemented in Italy, and the thyroid diseases incidence requiring complete thyroidectomy continues to rise (D'Orazi et al., 2019). Between December 2004 and 31 December 2014, 180 patients underwent total thyroidectomy for nonmalignant thyroid disease at the General Surgery Department, Sohag University Hospital, Sohag, Egypt (Mohamed & Ahmed.,2016).

Thyroidectomy carries the risk of complications. Hypocalcemia, wound infection, hematoma, recurrent laryngeal nerve (RLN) injury, and Horner's syndrome are the highest frequent postoperative complications. As a result, patients frequently experience distasteful symptoms such as shoulder stiffness, neck pain, and a pressing or choking sensation (Chahardahmasumi et al., 2019).

Neck stretching exercises that incorporate basic neck movements are simple and effective. By alleviating pain and muscle weakness, stretching exercises improve neuromuscular management and flexibility in patients. As a result, neck stretching trainings would be accomplished earlier, and a nurse should tutor patients how to do them and monitor their comfort following thyroidectomy (Nakamura et al., 2014).

Patients are encouraged to execute five repetitions of each stretching training 3-times daily (morning, afternoon, and evening) before surgery. They can resume these exercises on the morning of the first postoperative day. Additionally, they are informed that stretching trainings will not lead the wound to open or bleed to improve adherence to home exercises. The stretching exercises comprise of 8-steps: sufficiently relax the shoulders and neck, look down, turn your face to the right, turn your face to the left, the inclination of your head to the right, the inclination of your head to the left, turn your shoulders round and round, and gradually raise and lower your shoulders fully (Abd-El Mohsen & Ahmed, 2018).

Significance of the study

Due to the surgical position, patients may encounter posterior neck pain, movement difficulties of shoulder and neck, occipital headaches, shoulder stiffness, and

motion's cervical range of limitations after thyroidectomy. These symptoms may persist for an extended period following surgery and may even have a negative effect on the patient's quality of life (Genc et al., 2019). This present study is accomplished to teach patients neck stretching exercises after thyroidectomy to alleviate neck disability and pain.

Aim of the Study:

To assess effect of neck stretching exercises on patient' neck disability and pain after thyroidectomy.

Research Hypothesis

Neck stretching exercises have a greater impact on reducing disability and pain of the neck after thyroidectomy among the studied group than they do in the control group who will follow the hospital care's routine procedures.

2. Subjects and Methods

2.1. Research Design

This study employed a quasi-experimental design.

Setting:

The study was performed at Zagazig University Hospital's general surgery ward and outpatient surgery clinic.

Subject

This study enrolled (76) patients who were scheduled for thyroidectomy and were willing to participate. Patients were randomly assigned to one of two equal groups (study or control), with each group consisting of 38 patients. The study group had neck stretching trainings, while the control group had standard hospital care.

Tools for Data Collection

Three tools were implemented for collecting data to accomplish the study's objective:

Tool I: Patient Assessment sheet:

It was compiled by the researcher using recent national and international literature and is divided into two sections:

Part 1: Demographic data patient sheet:

To conduct a demographic analysis of patient data, the sheet contains seven items: Age, marital status, sex, occupation, level of education, residence and income level).

Part 2: Medical history evaluation: To determine the surgery type, the patient's medical history of chronic diseases such as diabetes, hypertension, heart disease, kidney disease, COPD, and asthma, as well as their lifestyle habits.

Tool II: The pain visual analogue scale (**Haefeli & Elfering, 2006**) was formed to describe the patients' level of pain intensity. The total scale score ranged from 0 to 10. 0 indicates no pain, 1 to 3 indicates mild pain, 4 to 6 indicates moderate pain, and 7 to 10 indicates severe pain.

Tool III: The Neck Disabilities and Pain Index (NDI) was developed by (Vernon H. & Mior S., 1991) to provide information about the effect of neck pain following surgery on ability. Ten items comprise the NDI: pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping, and recreation.

Neck pain and disability index questionnaire scoring system: The NDI consists of ten items, each with a possible score of five, for a total of fifty. The lower the score, the less disability is self-reported. The neck pain and disability index

questionnaires were graded according to the following criteria: 0-4 years of disability, 5-14 years of disability, 15-24 years of disability, 25-34 years of disability, and 35 years or more of disability.

Fieldwork:

This study was performed in the following manner

1. Design for Administrative

Official permission to conduct the study was obtained from the responsible authorities of the general surgery ward and outpatient surgery clinic at Zagazig University Hospital. To ensure the tools' validity and reliability, they were revised as essential by experts in nursing.

Validity and dependability of the content

Three expert professors in nursing and medicine reviewed the instruments for clarity, relevance, comprehensiveness, comprehension, applicability, and ease of use; then based on opinion minor modifications were done and then the final form were developed

A pilot study

A pilot study was conducted in January (2019) to determine the feasibility and practicability of the study tools. The study enrolled 10% of the sample (7 patients). Additionally, it provided an estimate of the time required to complete the tools.

Data collection process Assessment phase

During this stage, an evaluation of the patients level of neck disability and pain for each participant in terms of the study and control groups using Tool I and Tool II and

was performed in the general surgery department and outpatient clinics at Zagazig University Hospital (on the first day after surgery, 3rd day after surgery, the 1st week after surgery, and one month after surgery) following the thyroidectomy surgery to assess the impact of implementing the neck stretching training on the occurrence of neck disability and pain after thyroidectomy.

Planning Phase

The researcher reviewed relevant literature for the current study, both domestic and international, using textbooks, articles, and scientific journals. The proposed study setting was evaluated based on the patient population at Zagazig university hospital's general surgery ward and outpatient surgery clinic.

Implementation Phase

- 1-Data were gathered for seven months from February to August 2019 from the general surgery ward and outpatient surgery clinic at Zagazig university hospital.
- 2-The research was conducted during the morning and afternoon shifts.
- 3-The researcher interviewed both study and control group patients to establish a communication channel; after clarifying the study's aim and nature, the researcher acquired the patients' written consent for voluntary participation.
- 4-Patients were randomly assigned to one of two groups: control or study (control group received hospital routine care only while study received hospital routine care and teaching them neck stretching trainings)
- 5-The following tools were used to collect data: The Patient Assessment Sheet for

Tool I is divided into two sections: Patient demographic data sheet to assess demographic information about the patient and medical history. The pain visual analogue scale (tool II) quantifies the intensity of a patient's pain.

The Neck Pain and Disability Index, Tool III, provides information on neck pain following surgery on ability.

6-implementing the stretching trainings as instructed by the patient; relax your neck and shoulders sufficiently, look down, turn your face to the right side, turn your face to the left side, incline your head to the right side, incline your head to the left side, turn your shoulders round and round, and slowly raise and lower your shoulders fully. Three times a day, stretching trainings are designed. Following that, a demonstration and return demonstration was conducted, and these patients were provided with a booklet containing the training instructions.

7-Prior to discharge, the researcher coordinated follow-up appointments with study and control group patients, which were scheduled for the first month postoperatively in the outpatient clinic at Zagazig University Hospital. Compliance with stretching trainings was evaluated via telephone with patients who were at home.

Evaluation phase

This phase was meant to evaluate patients regarding occurrence of neck pain and disability in both groups of patients by using the same tools.

Administrative and ethical considerations:

Each patient gave informed oral consent after being informed about the study's purpose. Prior to the study's commencement, assumed privacy and the ability to withdraw at any time were realized. Privacy and confidentiality were upheld throughout the data collection process. There was no risk to the study subjects during the study's application.

Analytical Statistics

The gathered information from the sample was reviewed and updated, coded, and entered a personal computer (PC). The Statistical Package for Social Sciences (SPSS) version 20 was used for data entry and statistical analysis. The data were depicted in the form of frequencies, percentages, and mean standard deviation. The ANOVA test was used to determine whether there were any differences between groups.

Results

Table 1. This shows that the average age of studied subjects was 39.1 ± 14.7 years in the study group and 40.2 ± 15.4 years in the control group, in addition 68.4% and 47.4% of both groups were in the range of 18-40 years respectively. About 76.3% and 65.8% of studied subjects were female, and about 76.3% and 63.2% in both groups, respectively, were married. Concerning the half level of education of the patients read and write (50%) in the control group while (34.2%) for study group received a secondary education, respectively. As well as the profession, about half of the patients were unemployed (55.3%) and (47.4%) for both study and control groups, respectively. The majority of studied subjects, 68.4% in the control group and 55.3% in the study group, were rural. As regards income, 76.3%

and 71.1%, in both groups, respectively, was not enough.

Table 2 reveals that 63.2% and 57.9% of the study and control group had total thyroidectomy respectively. Concerning patients' medical history, about 47.4% of patients in the study group had hypertension, and 31.6% had asthma, while in the control group, 42.1% had hypertension. and 21.1% had asthma. Finally, in relation to health habits, most of the study and control groups were utilized to consume tea/coffee (92.1% and 78.9%), respectively.

Table (3) illustrates no statistically significant difference between the two groups (study and control) regarding the level of pain on the 1st day and 3rd day after surgery. In comparison, there was a significant difference between the two groups in 1st week and one month after surgery ($p < 0.001$). Regarding the level of disability, there was no statistically significant difference between both groups regarding level disability on the 1st day and 3rd day after surgery. There was a significant change between both groups in the 1st week and one month after surgery ($P < 0.036^*$, and 0.016^*), respectively.

Figure 1: Explain that the study group suffered from a level of neck pain after teaching neck stretching exercises following surgery lower than the control group in four times of evaluation (first day, third day, one week, and one month after operation).

Figure 2: shows that the study group suffered from a level of neck disability after teaching neck stretching exercises following surgery lower than the control group in four times of evaluation (first day, third day, one week, and one month after operation).

Table (1): Comparison of Socio-demographic characteristics between study group and control group (n=76)

| | Study Group (n=38) | | Control Group (n=38) | | Chi-Square | |
|--------------------------|--------------------|------|----------------------|------|----------------|----------|
| | n | % | n | % | X ² | p-value |
| Age (Years) | | | | | | |
| 18 – 40 | 26 | 68.4 | 18 | 47.4 | | |
| 41 – 60 | 8 | 21.1 | 14 | 36.8 | | |
| > 60 | 4 | 10.5 | 6 | 15.8 | 3.491 | 0.175 ns |
| Mean ±SD | 39.1 ±14.7 | | 40.2 ±15.4 | | T=0.328 | >0.05 ns |
| Sex | | | | | | |
| Male | 9 | 23.7 | 13 | 34.2 | | |
| Female | 29 | 76.3 | 25 | 65.8 | 1.024 | 0.312 ns |
| Marital Status | | | | | | |
| Single | 4 | 10.5 | 3 | 7.9 | | |
| Married | 29 | 76.3 | 24 | 63.2 | | |
| Divorced | 4 | 10.5 | 5 | 13.2 | | |
| Widow | 1 | 2.6 | 6 | 15.8 | 4.297 | 0.231 ns |
| Educational Level | | | | | | |
| Illiterate | 8 | 21.1 | 5 | 13.2 | | |
| Read And write | 12 | 31.6 | 19 | 50.0 | | |
| Secondary | 13 | 34.2 | 7 | 18.4 | | |
| University | 5 | 13.2 | 7 | 18.4 | 4.406 | 0.221 ns |
| Occupation | | | | | | |
| Employed | 14 | 36.8 | 15 | 39.5 | | |
| Unemployed | 21 | 55.3 | 18 | 47.4 | | |
| Retired | 3 | 7.9 | 5 | 13.2 | 0.765 | 0.682 ns |
| Residence | | | | | | |
| Urban | 17 | 44.7 | 12 | 31.6 | | |
| Rural | 21 | 55.3 | 26 | 68.4 | 1.394 | 0.238 ns |
| Income | | | | | | |
| Enough | 9 | 23.7 | 11 | 28.9 | | |
| Not Enough | 29 | 76.3 | 27 | 71.1 | 0.271 | 0.602 ns |

Table (2): Comparison of medical data between study group and control group (n=76)

| | Study Group (n=38) | | Control Group (n=38) | | Chi-Square | |
|------------------------|-----------------------|------|-------------------------|------|----------------|----------|
| | n | % | n | % | X ² | p-value |
| Type of Surgery | | | | | | |
| Total thyroidectomy | 22 | 57.9 | 24 | 63.2 | | |
| Partial thyroidectomy | 11 | 28.9 | 8 | 21.1 | | |
| Lobectomy | 5 | 13.2 | 6 | 15.8 | 0.652 | >0.05 ns |
| Medical History | | | | | | |
| Diabetes | 7 | 18.4 | 2 | 5.3 | 3.151 | >0.05 ns |
| Hypertension | 18 | 47.4 | 16 | 42.1 | 0.213 | >0.05 ns |
| Heart Diseases | 7 | 18.4 | 6 | 15.8 | 0.093 | >0.05 ns |
| Kidney Diseases | 7 | 18.4 | 7 | 18.4 | 0.000 | >0.05 ns |
| COPD | 8 | 21.1 | 7 | 18.4 | 0.083 | >0.05 ns |
| Asthma | 12 | 31.6 | 8 | 21.1 | 1.086 | >0.05 ns |
| Health Habits | | | | | | |
| Drinking Tea or Coffee | 35 | 92.1 | 30 | 78.9 | 2.657 | >0.05 ns |
| Smoking | 6 | 15.8 | 7 | 18.4 | 0.093 | >0.05 ns |
| Exercises | 5 | 13.2 | 8 | 21.1 | 0.835 | >0.05 ns |

Table (3): Comparison of pain score and neck disability score between study and control group and the follow-up period (n=76).

| | Study Group (n=38) | | Control Group (n=38) | | Student's T-test | |
|------------------------------|-----------------------|-----------|-------------------------|-----------|------------------|--|
| | Mean ±SD | Mean ±SD | t | P | | |
| Pain Score | | | | | | |
| First day | 8.5 ±1.0 | 8.5 ±1.3 | 0.000 | >0.05 ns | | |
| Three days | 7.6 ±1.3 | 7.3 ±1.1 | 1.106 | >0.05 ns | | |
| One week | 4.6 ±1.7 | 6.5 ±1.7 | 4.829 | <0.001*** | | |
| One month | 3.0 ±1.8 | 5.1 ±2.1 | 4.673 | <0.001*** | | |
| ANOVA test | | | | | | |
| F | 109.240 | 28.702 | | | | |
| P | <0.001 | <0.001 | | | | |
| Neck Disability Score | | | | | | |
| First day | 38.0 ±5.2 | 36.0 ±5.4 | 1.624 | >0.05 ns | | |
| Three days | 29.5 ±6.1 | 29.0 ±5.9 | 0.363 | >0.05 ns | | |
| One week | 22.5 ±8.0 | 26.4 ±7.7 | 2.141 | 0.036* | | |
| One month | 17.6 ± 10.2 | 23.2 ±9.7 | 2.454 | 0.016* | | |
| ANOVA test | | | | | | |
| F | 50.900 | 20.666 | | | | |
| P | <0.001*** | <0.001*** | | | | |

*, **, *** significant at p<0.05, 0.01, 0.001; ns, non-significant at p>0.05.

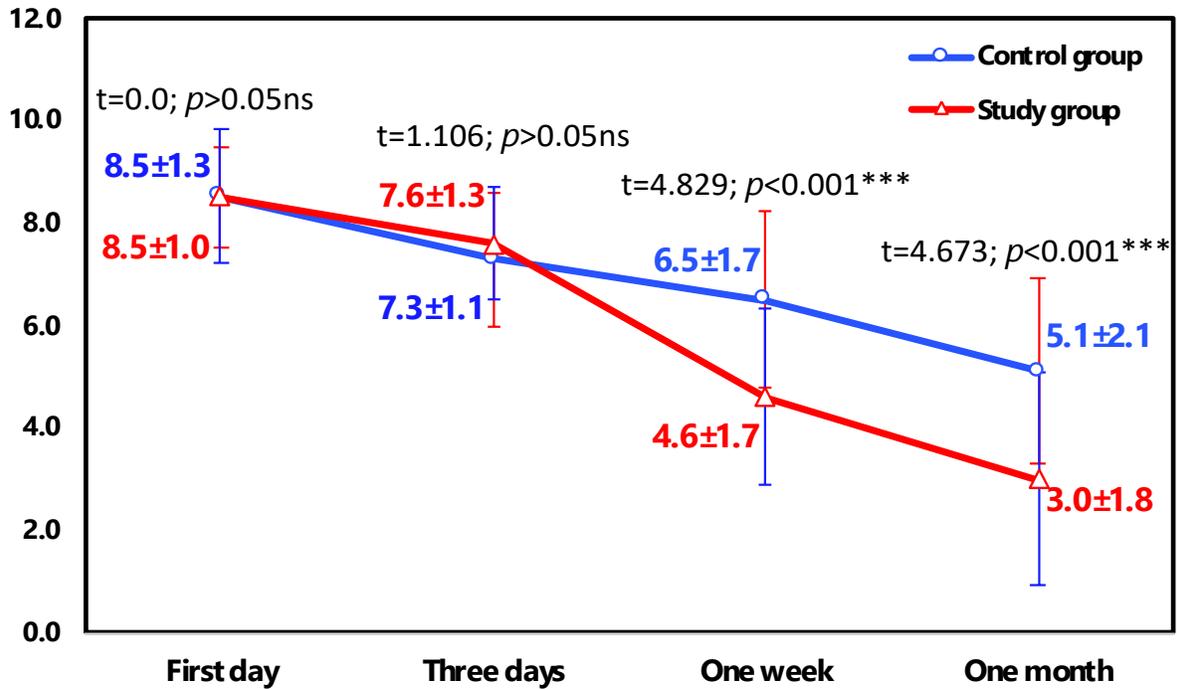


Figure (1): Comparison of pain score between study and control group along the follow-up period

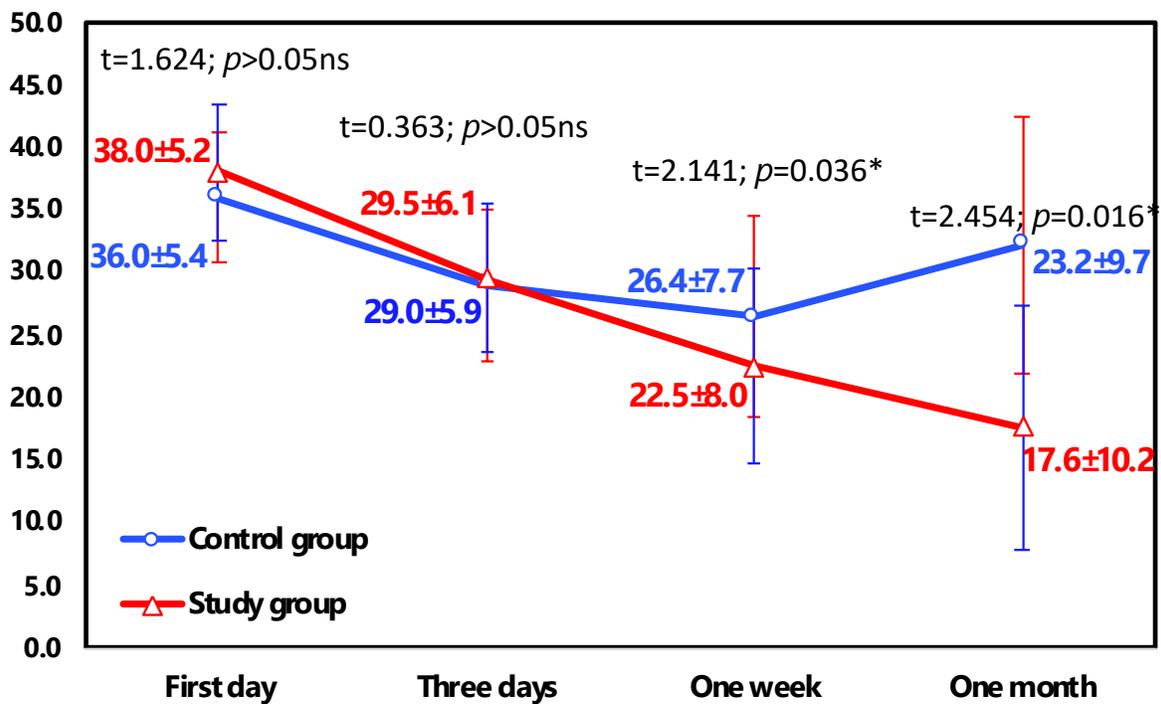


Figure 2. Comparison of neck disability score between study and control group along the follow-up period.

Discussion:

Patients frequently encounter neck discomfort symptoms such as neck pain, neck stress and pressure, shoulder stiffness, and shoulder and neck movement difficulties following thyroidectomy (**Ayhan et al., 2016**). The purpose of this study was to assess effect of neck stretching exercises on patients' neck disability and pain after thyroidectomy.

According to the age group of the patients in both groups, the current study showed they were around 18-40 years. This finding was in accordance with (**Abd-El Mohsen & Ahmed, 2018**), who stated that; the most common age was between 18-39 years. According to gender majority of them are females in both groups. These findings were consistent with (**El-Khateeb et al., 2015**), who found that most study patients were women. Also, according to the marital status, the present study revealed that; more than three-quarters of participants in the study group and nearly two-thirds of participants in the control group were married; this study finding was supported by (**Atasayar & Demir 2019**) mentioned that most patients were married women (85%).

According to education level of the patients in the control group, the half of patients were read and wrote. In contrast, only one-third of participants in the study group completed secondary school, and this agrees with (**Ayhan et al., 2016**) that stated more than half of patients in the control group (52.5 %) completed elementary school also these findings were consistent with (**Atasayar & Demir 2019**) who found that one-third of participants (33.3%) had a secondary degree.

The current study discovered that nearly half of patients in the study group and

almost two-thirds of patients in the control group also had a total thyroidectomy. This finding was nearly identical to that reported by (**Faisal et al., 2018**), who noted that more than half of patients (55%) underwent total thyroidectomy. Additionally, our findings contradicted those of (**Desoky et al., 2009**), who reported that subtotal thyroidectomy was the more frequently performed procedure for most patients.

Regarding medical history, less than half of the study and control groups had hypertension; this finding contradicted (**Chahardahmasumi et al., 2019**), who indicated that majority of study participants had hypertension in both groups.

The current study discovered that nearly all patients in both the study and control groups consumed tea or coffee, and may be due to the usual drink for most people in Egypt. This study's findings contradicted those of (**Abd-El Mohsen & Ahmed, 2018**), who discovered that less than half of patients drank tea or coffee.

In the present study, a substantial change in neck disability and pain was observed between the study and control groups 7-days after total thyroidectomy. Additionally, a significant difference exists between study and control subjects 30-days after thyroidectomy.

The present study revealed that neck stretching trainings had a positive effecting in decreasing pain level and disability among the study group more than the control group; this study finding was supported by (**Ayhan et al., 2016**) which stated that neck sensitivity was significantly lower in the stretching training group before, 7-days, and 30-days after thyroidectomy. In comparison to the control group, the stretching training patients had higher lower neck sensitivity.

Conclusions

Teaching and implementing neck stretching exercises had positive effect on the neck condition of patients in the study group in terms of decreasing pain and disability significantly more than the control group, which gained only routine hospital care.

Recommendations

In view of the recent study's findings, the following recommendations have been made:

- 1- The nursing staff should provide new patients continuous teaching at the general surgery department about neck stretching trainings following thyroidectomy.
- 2- Replicate the study in different areas to generate the study result.

References

- Abd-El Mohsen S A., & Ahmed N M., (2018):** Effect of teaching patients neck stretching exercises on neck pain and disability following thyroidectomy, *Journal of Nursing Education and Practice*; 8(1).
- Atasayar S., & Demir S G., (2019):** Determination of the Problems Experienced by Patients PostThyroidectomy, *Clinical Nursing Research* 2019; 28(5):615–635
- Ayhan H., Tastan S., Iyigün S., Oztürk E., Yildiz R.,& Görgülü S.,(2016):** The Effectiveness of Neck Stretching Exercises Following Total Thyroidectomy on Reducing Neck Pain and Disability: A Randomized Controlled Trial, *Worldviews on Evidence-Based Nursing*;13(3): 224-231.
- Chahardahmasumi E., Salehidoost R., Amini M., Aminorroaya A., Rezvanian H., Kachooei A., Iraj B Nazem, M., &Kolahdoozan M.,(2019):** Assessment of the Early and Late Complication after Thyroidectomy, *Adv Biomed Res*; 8: 14.
- Cirocchi R., Trastulli S., Randolph J., Guarino S., Rocco G D., Arezzo A., D'Andrea V., Santoro A., Barczyński M., & Avenia N., (2015):** Total or near-total thyroidectomy versus subtotal thyroidectomy for multinodular non-toxic goitre in adults, *Cochrane Database Syst Rev*;7(8):CD010370.
- Desoky AA., Mohamed MA., Ahmed MT., &Ghanem H M.,(2009):** Assessment of Nursing Performance for Patients Undergoing Thyroidectomy. *AAMJ*.2009; 7(2): 1-19.
- D’Orazi V., Sacconi A., Trombetta S., Karpathiotakis M., Pichelli D., Di LorenzoE., Ortensi A., Urciuoli P., Biffoni M., & Ortensi A., (2019):**May predictors of difficulty in thyroid surgery increase the incidence of complications? Prospective study with the proposal of a preoperative score, *BMC Surgery Journal*; 18(1 1):116.
- El-Khateeb AI, Ali HA, Makhlof GA, & Rizk M A.,(2015):** Total extracapsular thyroidectomy versus subtotal thyroidectomy in nonmalignant goiter.The *Egyptian Journal of Surgery*; 34(3): 166-169
- Faisal M., Fathy H., Risk A., & Atwa M M., (2018):** Incidental thyroid carcinoma after thyroidectomy for benign thyroid disease in Suez Canal

region, The Egyptian Journal of Surgery ; 37 (3): 361-367

Genc A., Çelik S U., Genc V., Gokmen D., Turi B S., (2019): The effects of cervical kinesiotaping on neck pain, range of motion, and disability in patients following thyroidectomy: a randomized, double-blind, sham-controlled clinical trial, Turk J Med Sci;49: 1185-1191

Haefeli M., & Elfering A., (2006): Pain assessment, Eur Spine J; 15: S17–S24.

Mohamed W B A., & Ahmed A E.(2016): Morbidity and mortality after total

thyroidectomy for nonmalignant thyroid disorder: 10 years' experience, The Egyptian Journal of Surgery; , 35:380–383.

Nakamura K., Kodama T., & Mukaino Y., (2014): Effects of active individual muscle stretching on muscle function. Journal of Physical Therapy Science; 26(3): 341-344.

Vernon H., & Mior S., (1991): The Neck Disability Index: a study of reliability and validity. J Manipulative Physiol Ther; 14(7):409-15.