

Effect of Simulation-Based intervention on Nurses' Performance regarding Neck Stretching Exercise for Patients Post Thyroid Surgery

1Ebtesam Aly Abd el Fatah Aly, 2Badr Ibrahim Ahmed Abdou Abd El Rahman, 3Manal Ibrahim Abd El Fatah Yassen

1 lecturer of Medical-Surgical Nursing Faculty of Nursing Minia University

2Fellow Medical-Surgical Nursing, University Student Hospital, Mansoura University

3Lecturer in Medical-Surgical Nursing Department, Faculty of Nursing, Beni-Suef University

Abstract

Background: Exercises for stretching the neck, including simple neck movements, are recognized to be the most straightforward and productive type of exercise. Stretching activities alleviate pain and muscle weakness, increase flexibility and neuromuscular coordination, promote good posture, and improve physical activity. **This study aimed to** evaluate the effect of the simulation-based intervention on nurses' performance regarding neck stretching exercises for patients post-thyroid surgery. **Method:** **Research design:** A quasi-experimental research design was used to achieve the aim of this study. **Setting:** The study was conducted in the surgical department at Minia University Hospital. **Subjects:** A convenient sample of all (50) nurses who worked at the previously selected setting was included. **Tools for data collection:** Tool I: A structured interviewing questionnaire: it consisted of two parts: Part I: Demographic data of the studied sample, Part II: - Nurses' knowledge regarding thyroid gland, thyroidectomy, and stretching exercises, and Tool II: Nurses' practices regarding stretching exercises (pre/posttest) was used to collect data. **Results:** There was a highly statistically significant difference between the studied nurses' knowledge and practice. The study result revealed that three-quarters of studied nurses had a poor level of knowledge, and three-fifths of them had an unsatisfactory level of practice about neck stretching exercises for patients post thyroid surgery before the implementation of the simulation-based intervention. The vast majority of the studied nurses had a good level of knowledge and most of them had a satisfactory level of practice after implementing simulation-based intervention. There was a highly statistically significant difference and improvement in nurses' performance after simulation-based intervention than pre-education. **Conclusion:** The present study concluded that simulation-based intervention had a positive effect on improving nurses' performance regarding neck stretching exercises for patients post-thyroid surgery. **Recommendations:** The study recommended that simulation-based intervention should be integrated as an effective method in nurses' training about neck stretching exercises for patients post-thyroid surgery.

Keywords: Nurse's performance, Neck stretching exercise, Simulation-based intervention.

Introduction:

Between 118,000 and 166,000 individuals in the US get a thyroidectomy each year, which is a threefold increase in thyroid procedures over the previous three decades (D'Orazi et al., 2019). A thyroidectomy involves surgically removing the thyroid gland entirely or in part. There are three main types of thyroid surgery: subtotal thyroidectomy, which removes only the thyroid remnants on one side, total thyroidectomy, which removes the thyroid tissue entirely on the macroscopic level, and thyroid lobectomy, which removes the thyroid gland and the half that contains the nodule (Abboud et al., 2022).

The following are rare but potentially fatal complications after total thyroidectomy: hypothyroidism, bleeding, injury to the superior or recurrent laryngeal nerve, thyrotoxicosis, wound infection, and damage to or unintentional removal of parathyroid glands, which results in hypoparathyroidism and

hypocalcemia. In addition, because of the fixed position of the neck during and after thyroidectomy surgery, the patients experience postoperative occipital headaches, neck pain, and discomfort, issues with neck and shoulder movement, shoulder stiffness, and limited range of motion in the cervical spine. These previously listed complaints may worsen the patient's quality of life and persist for a considerable amount of time after surgery (Christou & Mathonnet, 2023).

According to D'Orazi et al., (2019), benevolent nodular goiter can cause a variety of symptoms, such as neck discomfort and difficulty swallowing. Three to six months following surgery, patients having thyroidectomies frequently report an increase in their quality of life. Nevertheless, many patients experience neck and shoulder pain, constriction and pressure sensations, restricted laryngeal mobility, and choking sensations in the early

stages following surgery. **Perigli et al. (2021)** suggest that these characteristics may be the result of skin injuries, damage to the extra-laryngeal muscles or nerves, or a psychological response to neck surgery.

Furthermore, recurrent laryngeal nerve palsy, surgical edema, damage to the anterior strap muscles, affection of the external branch of the superior laryngeal nerve, injury to the vocal folds from intubation, and altered voice function may also result in swallowing impairment (**Abboud et al., 2022**). Though transient, these symptoms have the potential to lower the quality of life in general and specific diseases. After a variety of surgical procedures, including thoracotomy, mastectomy, and orthopedic surgery, stretching exercises help with muscle pain reduction and enhance range of motion, flexibility, functioning, and neuromuscular coordination. Patients who benefit from these kinds of procedures are frequently provided with physiotherapeutic care. Additionally, speech-language pathologists treat voice dysfunction patients by teaching them neck stretching exercises (**Miyauchi et al., 2021**).

Exercises for stretching the neck, including simple neck movements, are recognized to be the most straightforward and productive type of exercise. Stretching activities alleviate pain and muscle weakness, increase flexibility and neuromuscular coordination, promote good posture, and improve physical activity. In addition to assessing pain intensity and teaching patients about neck stretching exercises, nurses play a crucial role in educating patients about the warning signs and symptoms of potential complications following a total thyroidectomy. This is especially important for patients who can move their head, neck, and shoulders freely and who are in less pain. In addition to verbal and written instructions regarding the procedure and neck stretches, patients should also receive postoperative instructions regarding medication, wound care, diet, activities of daily living, and follow-up (**Jang et al., 2020**).

The nurses' main objectives are to reduce neck edema and pain. To be monitored during the post-operative phase, patients should be informed about neck pain treatment before surgery, as well as, if applicable, their families. Patients should be told that their distress stems from the surgical incision produced during a thyroidectomy (**Abboud**

et al., 2022). Stretching exercises are simple and easy to perform; they can be started the day following thyroid surgery and help reduce the symptoms of postoperative neck stiffness. In addition to reducing the requirement for analgesics (**Miyauchi et al., 2021**).

One of the most significant learning methods used in the nursing sector nowadays is simulation. It is a phony rendition of an actual training and performance assessment procedure. Simulation is not just for psychomotor skill instruction and practice. It is an empirically supported method of enabling excellent experiences that foster critical thinking and reasoning abilities (**Moran et al., 2018**). Through safe, simulation-based training programs, nurses can experience a range of clinical scenarios, including critical care procedures. Nurses who are fully immersed in the simulation scenario exhibit increased levels of engagement, deeper learning, and unique possibilities to apply gained knowledge into clinical practice. They also build technical clinical skills, adopt a holistic behavior approach, increase awareness of patient needs, and are more empowered to advocate for their patients (**Dearmon et al., 2023**).

Instilling skills and cultures in health workers through appropriate and successful simulation can help them become more efficient and confident while preparing them for safe and effective clinical care. Simulation might be simple or complicated; it is an educational tool, not a location or a technology. Offers a setting that is akin to actual circumstances as well. Without feeling pressured or uneasy, student nurses can hone their abilities with mannequins and models (**Toubasi et al., 2019**).

Nurses are crucial in educating patients about the warning signs and symptoms of possible complications following a total thyroidectomy. They should also evaluate the degree of pain and advise patients to perform neck stretching exercises even if they are not in as much pain or can move their head, neck, and shoulders freely. Patients should also be provided with written and verbal instructions regarding the procedure, neck stretching exercises, wound care, nutrition, daily living activities, and follow-up medications. Additionally, nurses should advise patients to move gently and completely to stretch their necks and shoulders because these exercises can help patients feel less pain and weaker in their muscles, as well as increase their level of flexibility and functionality (**Hameed, 2018**).

Nurses should convince patients that the surgical wound will not be harmed because stiffness is one of the

reasons for postoperative neck discomfort and most patients are scared to move their necks and shoulders after neck surgery. The following is the sequence in which the nurse should give the patients' instructions for performing the exercises: turn the shoulders back and forth, look down, move the face to the right, move the face to the left, incline the head to the right, incline the head to the left and finally, slowly raise and lower the hands (Perigli et al., 2021).

For one month, the participants were required to perform three sets of every stretching exercise (morning, lunch, and evening) with a 15-second rest at the end of the range before returning to the neutral position. Nurses working in the general surgery department are required to use the validated neck pain and disability evaluation in patient monitoring and to include stretching neck exercises in the care and follow-up protocols of patients who have undergone a total thyroidectomy (Iiff et al., 2022). A nurse should also advise patients to move and stretch their necks and shoulders slowly and thoroughly, as these exercises can help reduce discomfort and muscular weakness and increase the patient's range of motion and flexibility (Hameed, 2018).

Significance of the study:

From 2014 to 2016, there were discrepancies in the incidence of several thyroid diseases reported in the Arab globe. For example, the prevalence of goiter reported by multiple studies conducted in Egypt ranged from 6.18 to 47.34% (Mohamed, 2019). Patients commonly report discomfort symptoms in their neck, including shoulder stiffness, tension and pain in the neck, neck pain, and problems moving their neck and shoulders. Additionally, patients in the current study were observed to walk robotically and without moving their necks during the early postoperative period, probably to protect their incisions and avoid aggravating their neck pain, as was similarly reported by (Abboud, et al. 2022). So, the present study was conducted to evaluate the effect of Simulation-Based intervention on Nurses' Performance regarding Stretching Exercises for patients post-thyroid Surgery.

Aim of the study

This study aimed to evaluate the effect of simulation-based intervention on nurses' performance regarding neck stretching exercise for patients post thyroid surgery through:

- Assessing Nurses' knowledge regarding neck stretching exercises for patients post thyroid surgery.
- Assessing Nurses' practices regarding neck stretching exercise for patients post thyroid surgery.
- Designing and implementing the simulation-based intervention according to nurses' needs.
- Determining the effect of simulation-based intervention on nurses' performance regarding neck stretching exercise for patients post thyroid surgery.

Research hypothesis:

H1: Nurses' who receive the simulation-based intervention are expected to experience improved knowledge post-application than pre-application.

H2: Nurses' who receive the simulation-based intervention are expected to experience improved practice post-application than pre-application.

Subjects and Methods:

Research design:

A quasi-experimental research design was used to achieve the aim of this study.

Setting:

The study was conducted in the surgical department at Minia University Hospital. This setting was selected due to the high flow rate of cases additionally it serves the biggest region of the population.

Subjects:

A convenient sample of all (50) nurses who worked at the previously selected setting was included.

Tools of Data Collection

Two tools were designed by the researchers after reviewing current & past, local and international related literature by using periodicals journals, magazines, books, and computer search to construct the tool of the study. The following tools were used for data collection:

Tool I: A structured interviewing questionnaire: it was consisted of two parts:

Part 1: Demographic data of the studied sample including: (Age, Level of education, years of experience, Residence, and previous simulation training program participation).

Part II: - Nurses' knowledge regarding thyroid gland, thyroidectomy, and neck stretching exercises: It was adapted from (Mohamed, 2019) and (Abd Elazeem et al., 2020) and consisted of seventeen questions divided into two sections: A.

Understanding of hypothyroidism as it was concluded (9 questions). B. Understanding of neck-stretching exercises and how they ended (8 questions).

Scoring system

Every right response was valued at one, whereas every wrong response was valued at (zero). Three categories were used to classify the nurses' knowledge levels: poor (less than 50%), fair (50–75%), and good (more than 75%).

Tool II: Nurses' practices regarding neck stretching exercises (pre/posttest).

Researchers Perigli et al. (2021) reviewed relevant local, national, and worldwide literature before developing this tool, which was then used by Miyauchi et al. (2021) to evaluate nurses' stretching exercise practices. The topic of stretching exercises was demonstrated and then again.

Scoring system

The scoring system used by nurses for stretching exercises was as follows: correctly performed activities were scored (2), incomplete exercises were scored (1), and not completed exercises were scored (0). Alfar, El-sheik, Hassan, and Selim (21) state that all nursing practices were divided into two groups: practices that were deemed satisfactory and practices that were deemed unsatisfactory. A nurse's practice was deemed unsatisfactory if their score was less than 80%, and satisfactory if their score was greater than 80%.

Validity and reliability of the tools:

The content validity of the tools, their clarity, comprehensiveness, appropriateness, and relevance were reviewed by 5 experts (three professors in the field of Medical-Surgical nursing, and two professors in the orthopedic surgery department). Sentence clarity and content appropriateness were ensured by making modifications to the panel's decision. The Cronbach's alpha coefficient test yielded the following results about the internal consistency's reliability: tool I was 0.932 and tool II was 0.887.

Methods:

The study was conducted with ethical consent granted by the Ethical Research Committee of the Faculty of Nursing at Minia University. -In a letter from the dean of Minia University's faculty of nursing, the directors of the previously selected setting granted permission for this study

to be carried out. To obtain permission for collecting research data, the purpose of the project was outlined.

A pilot study

The pilot study was completed. Ten percent of the sample (5 nurses) was involved in the test to ensure that the generated tools were simple, feasible, clear, and applicable. The necessary revisions were made. The tools were created in their final version without any modifications. The pilot study was a part of the research's overall sample.

Ethical considerations:

To obtain their involvement and explain the study's goal, the researchers had a meeting with the directors of the selected setting before the study. Formal consent nurses were obtained for cooperation. The study's goals were communicated to the nurses. Enrollment in the study was entirely voluntary, and the patients were informed that they could withdraw their consent at any time, for any reason. Nurses were told that it would be utilized for research purposes only.

The procedure of data collection:

The researchers visited the settings they had previously selected three days a week. In the settings they had previously selected, the researchers visited with patients one-on-one and introduced themselves before outlining the goal of the study.

Implementation of the study included four phases (assessment phase, planning phase, implementation phase, and evaluation phase).

Phases of the study: There were four phases to the study's conduct:

I-Assessment Phase

Pre conducting the program, an interview with each nurse was conducted using a tool (I) part (1) to gather information about the nurses' characteristics.

- Tool (I) part (2) and tool II were used to evaluate the nurses' understanding and proficiency with stretching exercises.

II. Planning phase:

- To address the nurses' practical requirements and knowledge gaps regarding neck stretching exercises, the objectives, priorities, and expected results were outlined based on the results of the preceding phase. The researchers designed five sessions for the nurses under study—two theoretical and three practical.

- Following a review of the relevant literature based on an assessment of the actual needs of the patients under study, a simplified booklet was used as supportive material and provided to patients in Arabic. It covered all items regarding the knowledge and practice of exercise.

The educational program

An educational program was designed and revised. It included theoretical and practical sessions regarding neck stretching exercises.

The general objective of simulation-based training sessions:

After attending the courses, it was expected that the nurses would have gained new insights and strategies to improve their performance on neck stretching exercises.

Specific objectives of the program:

- Define neck Stretching Exercise.
- Know the neck purpose of the Stretching Exercise.
- Enumerate indications of the neck Stretching Exercise.
- Demonstrate the neck Stretching Exercise.
- Perform the appropriate documentation.

III. Implementation phase:

- The use of simulation-based training was meant to improve nurses' performance in neck stretching exercises throughout five sessions—two theoretical and three practical sessions, each lasting between thirty and forty-five minutes.

Before each session, the researchers solicited feedback regarding the preceding session, and after each, they provided a summary.

"-Three days a week, from 9 a.m. to 1 p.m., the researchers were accessible in the study areas. The aforementioned research instruments were utilized to conduct one-on-one interviews with each nurse.

- Six to eight nurses per group were used to classify the examined nurses into subgroups.

- The condensed handbook, which covered all topics about knowledge and skills, was provided to nurses in Arabic as supplemental knowledge - Through five sessions—two theoretical and three practical sessions lasting between 30 and 45 minutes each—the application of simulation-based training was intended to enhance nurses' performance about neck stretching exercises.

Before each session, the researchers solicited feedback regarding the preceding session, and after each, they provided a summary.

"-Three days a week, from 9 a.m. to 1 p.m., the researchers were accessible in the study areas. The aforementioned research instruments were utilized to conduct one-on-one interviews with each nurse.

- Six to eight nurses per group were used to classify the examined nurses into subgroups.

- The condensed handbook, which covered all topics about knowledge and skills, was provided to nurses in Arabic as supplemental information regarding neck Stretching Exercises after reviewing the associated literature based on the assessment of the actual needs of the studied nurses.

- Different teaching methods such as lectures, small group discussions, pictures, brainstorming, demonstration, and re-demonstration using the necessary equipment and simulation manikin that was available in a hospital teaching class faculty clinical lab to apply for simulated education program. Several teaching media were used, such as handouts, PowerPoint, figures, flipcharts, and illustrated videos were used about neck Stretching Exercises.
- Structured neck stretching exercises consisted of the following instructions; relaxing the neck and shoulders sufficiently, looking down, turning face to the right side, turning face to the left side, inclining head to the right side, inclining head to the left side, turning shoulders round and round, and slowly raising shoulders fully then lowering again, holding each movement for 30 s. Each exercise was repeated three times. Finally, a neck stretching exercise was performed by returning the head five times for 3–5 s. The participants were informed that the stretching program included two sessions/day for 5 days/week for 1 month, and each session took about 10 min to perform. The participants were also instructed to keep compliance with an exercise diary to monitor their exercise frequency. Also, the participants received a brochure indicating the proper position and ergonomics to be applied during daily work. These brochures were prepared in simple Arabic language with illustrations. Then, the researchers asked the participants to complete the questionnaires post-test.
- The neck stretching exercise was performed at least three times a day beginning the morning following surgery. Patients were told that the surgical wound would no open or bleed as a result of the neck stretching exercise, and thus started the exercise, at first guided by a doctor. It was important to encourage patients to move their necks and shoulders and to stretch their necks slowly and fully. Patients performed the exercise by themselves for the second time during their hospitalization and also after their discharge. Compliance with the stretching exercise was checked by a

nurse or doctor during their daily consultations. If unsatisfactory, the stretching exercise was described again



The theoretical and practical sessions were carried out like the subsequent.

- Theoretical (first session): The researchers gave a brief introduction, greeted the nurses, expressed gratitude for their participation in the study, and described the goals of these training sessions. The following topics were covered in the first session: the definition, goal, and potential side effects of the neck stretching exercise.

- The second session (theoretical) discussed topics about the nurse's responsibility for stretching exercises and for preventing any difficulties that may arise from doing so.

- Third session (Practical): teaching the nurses under study on patient assessment and preparation before neck stretching exercises

- 4. The fourth session, was practical, including the faculty clinical lab neck stretching exercise clinical demonstration and re-demonstration of the researched nurses. The simulation manikin served as the tool for these exercises. Following the faculty lab sessions, trainees moved to the designated Minia University Hospitals setting to receive real-time re-demonstration under the guidance of researchers. This was done to build their confidence and validate their competency in carrying out the operations for their patients.

- Fifth session (Practical): The researcher began by asking participants about their thoughts on the previous sessions and responding to any queries they had regarding the stretching exercises. After that, she gave out the post-test and thanked all of the participant's nurses for their participation in the study.

IV-Evaluation phase:

The effectiveness of the simulated-based intervention was evaluated by reevaluating the nurses' performance using the aforementioned tools both immediately following the implementation of the intervention (posttest) and one month later (follow-up).

for the patients.

Statistical analysis:

• Information was translated, coded, and tabulated into a form that was specifically made to be input into a computer. SPSS version 22 was utilized for data entry and analysis. The Excel program was used to help make the graphics. The same group's pretest and posttest results were compared using t-tests, which were used to analyze quantitative data presented as mean and SD. Quantitative data was expressed as numbers and percentages. Pearson correlation was used to explain the link between quantitative variables that were normally distributed. Using a P-value of 0.05, the significance was ascertained as follows:

• A statistically significant P-value was defined as less than 0.05.

• A highly statistically significant P-value was defined as being less than or equal to 0.001.

Results:

Table 1 demonstrates that 76% of the nurses under study were female and that (54%) of them were above 25 years old with a mean age of 27.4 ± 3.5 years. Regarding the researched nurses' qualifications, the majority (70%) were from Technical Institutes of Nursing. Of those with experience, 48% had between five and fewer than ten years.

Table (2) presents an improvement in nurses' knowledge pre-, immediately post-, and two months post-simulated-based intervention, with a highly statistically significant difference discovered ($P < 0.001$).

Table (3) reveals that before receiving the simulated-based intervention, 68% of nurses had an inadequate understanding of the procedures. On the other hand, following the simulated-based intervention, their level of knowledge increased to a good degree (96.0%) and two months later (94.0%). Nurses' knowledge levels before and immediately after the simulated-based intervention differed significantly from two months later ($P < 0.001$).

Table 4 shows that pre and immediate post-intervention, and two months later, there was a highly significant statistical difference. This table demonstrated that 46% of the nurses under study had unsatisfactory practice with assessment and preparation before neck stretching exercises before the intervention, while 96% and 100% of them, respectively, had satisfactory practice immediately following and two months following simulated-based interventions. Moreover, it was discovered that 64% of the nurses under study had unsatisfactory practice with the technique of neck stretching exercises before the intervention, but 98% of them had satisfactory practice immediately following the program and 90% of them had satisfactory practice two months after the simulated-based intervention.

The study's nurses' practice levels for neck stretching exercises before, throughout the first two months following,

and just after the simulated-based intervention were distributed as shown in Figure (1). It revealed that 88% of the nurses in the study had an unsatisfactory practice level before the two months of the simulated-based intervention, while 90% of the nurses had a satisfactory practice level following the intervention.

Table 5: demonstrates that the overall scores of nurses' knowledge and practices regarding neck stretching exercises before and after simulation-based intervention showed a highly statistically significant difference with a favorable association.

Table (1): Demographic characteristics distribution among the studied nurses (n. =50)

Demographic characteristics	No.	%
Age (Years)		
< 25 years	27	54
25 - ≥ 36 years	23	46
Mean ± SD	27.4 ± 3.5	
Gender:		
Male	12	24
Female	38	76
Qualifications:		
Technical Institute of Nursing	35	70
Baccalaureate degree in nursing	15	30
Years of experience:		
< 5 years	14	28
5 – <10 years	24	48
10 - ≥15 years	12	24

Table (2): Percentage distribution of the studied nurses' knowledge regarding neck stretching exercise pre-, immediately post, and two months post-simulated based intervention (n. =50)

Nurses' knowledge regarding stretching	Pre-simulated based	Immediately Post-simulated based	Two months Post-simulated based	F	P-value
--	---------------------	----------------------------------	---------------------------------	---	---------

exercise	intervention		intervention		intervention			
	No	%	No	%	No	%		
Definition								
Correct	29	58.0	50	100	50	100	79.5	<0.001**
Incorrect	21	42.0	0	0.0	0	0.0		
Purposes								
Correct	23	46.0	50	100	50	100	96.6	<0.001**
Incorrect	27	54.0	0	0.0	0	0.0		
Indications								
Correct	26	52.0	50	100	45	94.0	99.8	<0.001**
Incorrect	24	48.0	0	0.0	5	6.0		
Role of the nurse during stretching exercise								
Correct	40	40.0	46	98	46	92.0	88.9	<0.001**
Incorrect	60	60.0	4	2.0	4	8.0		
Complications								
Correct	29	58.0	49	96.0	47	94.0		<0.001**
Incorrect	21	42.0	1	4.0	3	6.0	96.6	

(**) highly statistical significance at $p < 0.001$

Table (3): Percentage distribution of the studied nurses' knowledge level regarding neck stretching exercise pre-, immediately post, and two months post simulated based intervention (n=50)

Nurses' knowledge level	Poor		Average		Good		F	-value
	No.	%	No	%	No	%		
Pre-intervention	34	68.0	14	28.0	2	4.0	127.7	<0.001**
Immediately post-intervention	0	0.0	2	4.0	48	96.0		
Two months Post-intervention	0	0.0	3	6.0	47	94.0		

(**) Highly significant at $P < 0.001$

Table (4): Percentage distribution of the total nurses' practice regarding neck stretching exercise pre-, post, and two months post simulated based intervention (n=50)

Nurses' practice	Pre-simulated based intervention				Immediately Post- simulated based intervention				Two months Post- simulated based intervention				F	P
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory			
	No	%	No	%	No	%	No	%	No	%	No	%		
Assessment and preparation	23	46.0	27	54.0	0	0	50	100	2	4.0	48	96.0	87.2	0.000**
Technique of neck stretching exercise	37	64.0	18	36.0	2	2.0	48	98.0	5	10.0	45	90.0	99.36	0.000**

(**) Highly significant at $P < 0.001$

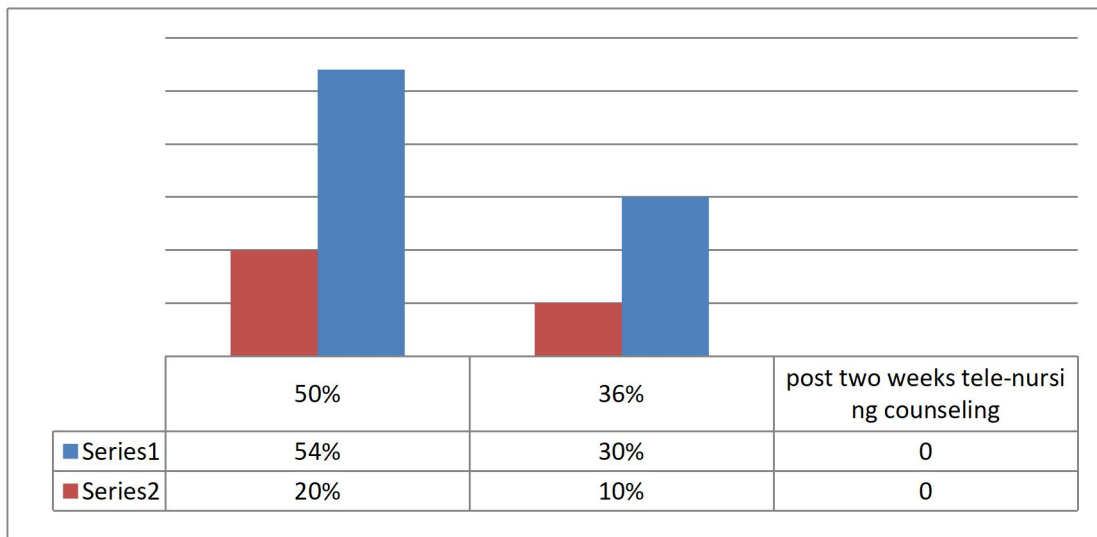


Figure (1) Distribution of the studied nurses' practice regarding neck stretching exercises pre-, immediately, and post-simulated based on intervention.

Table (5): Correlation between total scores of nurses' knowledge and practices regarding neck stretching exercise pre and post-simulation-based intervention

	Total Knowledge			
	Pre		Post	
	R	P-value	r	P-value
Total practices	0.26	0.01*	0.74	0.001**

*: Statistically significance at $p \leq 0.05$

Discussion

Thyroid gland diseases are very important since they present a challenge for treatment, whether medicinal or surgical. The standard surgical method for treating thyroid disorders is thought to be a total thyroidectomy. Goiter, hypothyroidism, hyperthyroidism, thyroiditis, and neoplasms are the main conditions affecting the thyroid gland (Perigli et al., 2021). The degree of surgery, the indication for surgery, and the surgeon's training and experience all have a significant impact on the rate of complications. In contrast to other procedures that are often performed, problems after thyroid surgery are uncommon but frequently have life-threatening outcomes (Miyachi et al., 2021).

Among the most popular surgical procedures, thyroidectomies are performed to treat benign and malignant thyroid disorders, including ambiguous thyroid nodules, goiter, hyperthyroidism, and thyroid cancer. The anatomical location of the thyroid gland influences neck stiffness

following thyroidectomy. The daily activities of the patients may therefore be impacted by this (Iliff et al., 2022).

Patients commonly have pain following thyroidectomy, including tight shoulders, neck aches, and trouble moving. Thus, the implementation of neck exercises by nurses has a crucial role in improving patients' neuromuscular coordination and flexibility by lowering pain and muscle weakness and improving their postoperative health (Abd Elazeem et al., 2020).

Nursing educators can assist aspiring nurses get ready for practice by using strategies like simulation. Performance is the completion of a given task with established benchmarks for accuracy, completeness, cost, and timeliness. Poor outcomes may be associated with inadequate nursing knowledge preparation and inadequate skill, according to a growing body of research (McGaghie et al., 2019). The purpose of this study is to assess how well nurses perform neck stretching exercises for patients who have had thyroid

surgery in light of the impact of a simulation-based intervention.

Over three-quarters were female, according to the study's findings. Until a few years ago, nursing in Egyptian institutions was only open to girls; this fact may account for the high proportion of females in the current study. This fact could help to explain the findings.

The study's results showed that nurses' knowledge had improved between before and immediately after the simulated-based intervention, with a highly statistically significant difference observed between the two months later. It was confirmed, in the researchers' opinion, that the simulated-based intervention had very positive results.

According to certain research, simulation-based education does not affect increasing nursing students' skill performance (Morton et al., 2019; Durmaz et al., 2022; Karabacak et al., 2019; Lee et al., 2019). This offers users the task of continuously evaluating their performance following the simulation's execution, and it gives researchers an assignment to explain why.

According to Kim et al. (2020), simulation-based learning facilitates repeated practice and helps consumers or learners understand the complexity of health service delivery. Additionally, engaging in simulation reduces errors made during real practice and boosts adaptability (Eyikara & Baykara, 2021). The influence of simulation over skill performance in the current review, irrespective of the types of simulation, shows a bigger effect size that is favorable to the users, which is consistent with a systematic review conducted by others (Orique & Phillips; (2018); Huang et al., (2019); Yuan et al., 2022).

Some individual research (Morten et al., 2019; Karabacak et al., 2019; Lee et al., 2019; Durmaz et al., 2022) reported and scored results that reveal a lack of evidence to prefer the usage of simulation from traditional teaching techniques, in contrast to the overall effect size result. This suggests the need for more data and the need to look for probable causes that could have a major impact on whether this teaching method is successful or unsuccessful.

The current study's findings showed that before receiving the simulated-based intervention, just over two-thirds of nurses lacked enough knowledge of the processes. However, following a simulated-based intervention, nurses' knowledge

increased to a decent level; two months after the simulated-based intervention, nurses' knowledge levels differed significantly from pre- and immediately post-intervention.

According to the researchers, this shows how successful the simulated-based intervention was. This demonstrated how crucial it was to comprehend the simulated-based intervention's goal to increase knowledge. The "Effects of high-fidelity simulation-based on life-threatening clinical condition scenarios on learning outcomes of undergraduate and postgraduate nursing students" study by Cerra et al. (2018) lends credence to this conclusion and states that simulation training had positive effects on nursing students' knowledge and performance.

The study's conclusions show that nurses' awareness of neck stretching exercises improved before, immediately after, and two months after the simulated-based intervention. There was also a highly statistically significant difference identified. It was confirmed, in the researchers' opinion, indicated the intervention based on simulation produced excellent outcomes.

According to Asegid & Assefa (2021), supporting simulation-based instruction did enhance nursing students' performance in skills. This outcome was consistent with their findings. Once more, the application of simulation-based instruction proved beneficial for training clinical nursing staff members as well as students.

The study found a statistically significant difference in nurses' neck stretching exercise practices before, immediately after, and two months after the intervention. The researcher believes that to reduce the incidence of unfavorable events during hospitalization and to demonstrate the efficacy of pre-, immediately post-, and two-month post-simulated intervention, it is imperative to enhance the skills of nurses to enable them to meet the unique needs of their patients about neck stretching exercises.

Utilizing a variety of resources to absorb the actual scenario is the active learning approach known as simulation. Additionally, it gives trainees a safe setting in which to hone their abilities, apply clinical reasoning, and decide how best to care for patients. According to Eyikara and Baykara (2021), it is also perfect for teaching introspective skills and crisis management to patients.

Following a simulated-based intervention, the study's results showed that the nurses under investigation had a satisfactory degree of practice. According to the researchers, this demonstrated how well the simulated-based intervention worked to improve the investigated nurses' practices and raise their clinical practice level scores.

This was consistent with earlier research by **Nuraini et al. (2019)** who investigated how simulation-based learning affected nursing students' real-world performance and found that it improved their performance, as well as **Gomes et al. (2020)**, who looked at "Clinical simulation for the teaching of wound evaluation and treatment." Furthermore, clinical simulation was found to be a successful strategy by **Beal et al. (2019)** for raising study participants' performance in comparison to alternative training modalities.

As a consequence of the current study, nurses' overall knowledge and practice of neck stretching exercises before and after simulation-based intervention were observed to differ significantly ($p < 0.05$), with a positive correlation. The improvement in nurses' knowledge and practice was the study's main goal, and it was confirmed to have been accomplished.

Conclusion:

From the findings of the present study, it can be concluded that simulation-based intervention had a positive effect on improving nurses' performance regarding neck stretching exercises for patients post-thyroid surgery.

Recommendations:

It is advised that in light of the results of the current study:

- The study recommended that simulation-based intervention should be integrated as an effective method in nurses' training about neck stretching exercises for patients post-thyroid surgery.
- The establishment of a written colored illustrated educational booklet and guidelines about neck stretching exercises needs to be reviewed and updated regularly.
- In-service training programs should be carried out for nurses working in the head and neck surgery department about complete care for patients pre and post-thyroidectomy.
- Facilitating opportunities for nurses to attend continuing educational programs about thyroid

gland diseases and care of patients undergoing thyroidectomy.

- Continuous training for nurses working in the surgical department about the updates about neck stretching exercises is recommended.
- To enable generalization, more investigation and replication of this work with a large sample size are needed.

References:

1. Abboud, B., Sleilaty, G., Rizk, H., Abadjian, G., & Ghorra, C. (2022). Safety of thyroidectomy and cervical neck dissection without drains. *Canadian Journal of Surgery*, 55(3), 199. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3364308/>
2. Abd Elazeem Y, Abdel-Karim N, Aly E. Effect of Perioperative Instructions on Postoperative Discomforts and Satisfaction Level among Patients Undergoing Thyroidectomy. *Evidence-Based Nursing Research* 2020; 2(1):12. Available from: <http://eepublisher.com/index.php/ebnr/article/view/109>
3. Al Shahrani, A. S., El-Metwally, A., Al-Surimi, K., Salih, S. B., Saleh, Y., Al-Shehri, A., & Ali, A. (2022). The epidemiology of thyroid diseases in the Arab world: A systematic review. *Journal of Public Health and Epidemiology*, 8(2), 17-26.
4. Asegid A, Assefa N. (2021): Effect of simulation-based teaching on nursing skill performance: a systematic review and meta-analysis. *Front Nurs.*;3:193–208.
5. Beal, M. D., Kinnear, J., Anderson, C. R., Martin, T. D., Wamboldt, R., Hooper, L. The Effectiveness of Medical Simulation in Teaching Medical Students Critical Care Medicine. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare*, 2017; 12(2): 104–116.
6. Cerra, C. La, Dante, A., Caponnetto, V., Franconi, I., Gaxhja, E., Petrucci, C., Alfes, C. M., Lancia, L. Effects of high-fidelity simulation-based on life-threatening clinical condition scenarios on learning outcomes of undergraduate and postgraduate nursing students: a systematic review and meta-analysis, 2019; 2(2): 103–117.
7. Christou, N., & Mathonnet, M. (2023). Complications after total thyroidectomy. *Journal of visceral surgery*, 150(4), 249-256.

- <https://www.sciencedirect.com/science/article/pii/S187878861300060X>
8. D'Orazi, V., Sacconi, A., Trombetta, S., Karpathiotakis, M., Pichelli, D., Di Lorenzo, E., & 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*, 18(1), 1-8. <https://bmcsurg.biomedcentral.com/articles/10.1186/s12893018-0447-7>
 9. Dearmon V, Graves RJ, Hayden S, et al. Effectiveness of simulation-based orientation of baccalaureate nursing students preparing for their first clinical experience. *J Nurs Educ*. 2023; 52:29–38.
 10. Durmaz A, Dicle A, Cakan E, Cakir Ş. Effect of screen-based computer simulation on knowledge and skill in nursing students' learning of preoperative and postoperative care management a randomized controlled study. *Comput Inform Nurs*. 2022;30:196–203.
 11. Eyikara E, Baykara ZG. The importance of simulation in nursing education. *World J Educ Technol*. 2021;9:6.
 12. Gomes, J. L., Railka De Souza, A., Kumakura, O., Zanchetta, C, Dias Coutinho, R., Helena, M., Lima, M. Clinical Simulation for Teaching of Wound Evaluation and Treatment, 2020; 15(1):55-77. <https://doi.org/10.1016/j.ecns.09.003>
 13. Hameed, A.T. (2018). Effectiveness of an Educational Program on Nurses' Knowledge and Practices about Prevent Complications for Patients Undergoing Thyroidectomy at AlHusseini Teaching Hospital in Al-Nasiriyah City. *Journal of Global Pharma Technology*. https://www.researchgate.net/profile/Mochamad_Hatta/publication/327813841_A_review_Worldwide_medicinal_plants_for_typhoid_fever/links/5ebf93ce299bf1c09ac0ba49/A_review_Worldwide-medicinal-plants-for_typhoid_fever.pdf#page=87
 14. Huang J, Tang Y, Tang J, et al. Educational efficacy of high-fidelity simulation in neonatal resuscitation training: a systematic review and meta-analysis. *BMC Med Educ*. 2019; 19:323.
 15. Iloff H, El-Boghdady K, Ahmad I, et al. Management of hematoma after thyroid surgery: systematic review and multidisciplinary consensus guidelines from the Difficult Airway Society, the British Association of Endocrine and Thyroid Surgeons, and the British Association of Otorhinolaryngology, Head and Neck Surgery. *Anesthesia*. 2022;77(1):82-95.
 16. Jang, J. Y., Chang, Y. S., Kim, E. H., Moon, J. H., & Son, Y. I. (2020). Early neck exercises to reduce post-thyroidectomy syndrome after uncomplicated thyroid surgery: a prospective randomized study. *Journal of Korean Thyroid Association*, 7(1), 70-76. <http://www.koreamed.org/SearchBasic.php?RID=2325294>
 17. Karabacak U, Unver V, Ugur E, Examining the effect of simulation-based learning on self-efficacy and performance of first-year nursing students. *Nurse Educ Pract*. 2019;36:139–143.
 18. Kim J, Park J-H, Shin S. Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. *BMC Med Educ*. 2020; 16:176–182.
 19. Lee BO, Liang HF, Chu TP, Huang CC. Effects of simulation-based Learning on nursing student competencies and clinical performance. *Nurse Educ Pract*. 2019;41:102646.
 20. McGaghie, W. C., Issenberg, S. B., Cohen, E. R., Barsuk, J. H., Wayne, D. B. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Academic Medicine*, 2019; 86(6): 706–711. <https://doi.org/10.1097/ACM.0b013e318217e119>
 21. Miyauchi A, Ito Y, Miya A. Stretching Exercise for the Prevention of Postoperative Neck Symptoms Following Thyroid Surgery. *Video Endocrinology* 2021; 8(1).
 22. Mohamed Z. Effect of Neck Stretching Exercises on Patient's Neck Disability and Pain Thyroidectomy. *Egyptian Journal of Health Care* 2019; 10(4): 424-34.
 23. Moran V, Wunderlich R, Rubbelke C. Simulation in Nursing Education. *Simulation: Best Practices in Nursing Education*: Springer, Cham; 2018.
 24. Morton SB, Powers K, Jordan K, et al. The effect of high-fidelity simulation on medical-surgical nurses' mock code performance and self-confidence. *MEDSURG Nurs*. 2019;28:6.
 25. Nuraini, T., Afifah, E., Agustini, N., Pujasari, H., Masfuri, M., Milani, A. Human patient simulation to improve the attitude of the nursing students. *Journal of Nursing Education and Practice*, 2015. 5(4): 52.
 26. Orique SB, Phillips LJ. The effectiveness of simulation on recognizing and managing clinical deterioration: meta-analyses. *West J Nurs Res*. 2018; 40:582–609.
 27. Perigli G, Cianchi F, Giudici F, et al. Thyroidectomy for Cancer: The Surgeon and the Parathyroid Glands Sparing. *J Clin Med*. 2021; 10(19):4323.
 28. Takamura, Y., Miyauchi, A., Tomoda, C., Uruno, T., Ito, Y., Miya, A., & Kuma, K. (2020): Stretching

exercises to reduce symptoms of postoperative neck discomfort after thyroid surgery: a prospective randomized study. *World journal of surgery*, 29(6), 775-779.

<https://link.springer.com/article/10.1007/s00268-005-7722-3>

29. Toubasi S, Alostta MR, Darawad MW, Demeh W. Impact of simulation training on Jordanian nurses' performance of basic life support skills: a pilot study. *Nurse Educ Today*. 2019;35:999–1003.
30. Yuan HB, Williams BA, Fang JB, Ye QH. A systematic review of selected evidence on improving knowledge and skills through high-fidelity simulation. *Nurse Educ Today*. 2022;32:294–298.