Nursing Instructions and patients' health outcomes post Tympanoplasty

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Abstract

Background: Tympanoplasty is defined as surgical procedure to eradicate infection and restore the function of the middle ear. It is the commonest procedure performed in patients with chronic otitis. **Aim of the study**: The study aimed to evaluate the effect of the nursing instructions on patients' health outcomes post tympanoplasty. **Study design:** Quasi-experimental study design was implemented to achieve the aim of the present study. **Setting:** The present study conducted in otolaryngology department and outpatient clinic at Benha University Hospital. ,Qalyubia , Egypt. **Subjects:** Purposive sample of ٨٠ adult patients post tympanoplasty, were included in the study **Tools of data collection:** Four tools were used in the study **Tool I** Structured interview questionnaire, **Tool II** patients' self-care practice assessment **Tool III** Hearing Handicap Inventory for Adults (HHIA) Scale **Tool IV** Post operative complications assessment**. Results: there was a statistically significant differences regarding basic knowledge about ear drum perforation between pre and post nursing instructions' implementation, in term of improvement in knowledge level. Where, causes of eardrum perforation and diagnostic methods of eardrum perforation were of the highest areas of correct knowledge post nursing instructions among ٩٠.٠٪ compared to ٤٠.٠٪ & ٣٥.٠٪, respectively pre instruction implementation, there was a statistically significant differences regarding total patients' self-care practice after tympanoplasty between pre and post nursing instructions' implementation, in term of statistical significance improvement in self-care practice level. Where, dealing with the wound after tympanoplasty was of the highest area of satisfactory total self-care practice post nursing instructions among ٧٥.٠٪ compared to ١٣.٨ % pre instruction implementation. Conclusion:** patients post tympanoplasty had marked improvement in knowledge and practice score and they had significant statistical reduction in the incidence of complications post nursing instruction which confirmed the study hypotheses.

Recommendation: Replication of the study using a larger probability sample from different geographical regions for generalization of results.

Key Words: Nursing instructions, Health outcomes, tympanoplasty

Introduction

Tympanic membrane perforation is a hole or tear in the thin tissue that separates the ear canal from the middle ear (eardrum). A ruptured eardrum can result in hearing loss. It can also make the middle ear vulnerable to infections symptoms include; hearing loss, a ringing or buzzing sound of ear (tinnitus), ear pain, itching in the ear, clear fluid, blood and pus leaking from ear, feeling dizzy and high temperature **(Zhang & Ghufoor, ٢٠٢٥).**

Tympanic membrane perforation caused by middle ear infection (otitis media); a middle ear infection often results in the accumulation of fluids in the middle ear. Pressure from these fluids can cause the eardrum to rupture. Barotrauma; barotrauma is stress exerted on the eardrum when the air pressure in the middle ear and the air pressure in the environment is out of balance. Loud sounds or blasts (acoustic trauma); a loud sound or blast, as from an explosion or gunshot, foreign objects such as a cotton swab or hairpin, severe head trauma such as a skull base fracture, may cause the dislocation of or damage to middle and inner ear structures, including the eardrum **(Dilfuza, ٢٠٢٥).**

Tympanic membrane perforation can lead to hearing loss, usually, hearing loss is temporary, lasting only until the tear or hole in the eardrum has healed. Middle ear infection (otitis media), a ruptured (perforated) eardrum can allow bacteria to enter the ear. If a perforated eardrum doesn't heal, a small number of people may be vulnerable to ongoing (recurrent or chronic) infections. Middle ear cyst (cholesteatoma). Although very rare, this cyst, which is composed of skin cells and other debris, can develop in the middle ear as a long-term result of eardrum rupture **(Eshraghi, ٢٠٢٤).**

Tympanoplasty is the surgical procedure performed to repair a perforated tympanic membrane, with or without reconstruction of the ossicles, to prevent reinfection and restore hearing ability. Microscopic and endoscopic approaches are utilized for tympanoplasty. Many times, healthcare provider treat ruptured eardrum with ear drops or antibiotics. But if eardrum doesn't heal after two or three months, patient may need tympanoplasty to prevent problems like hearing loss, chronic infection and dizziness. Healthcare providers perform tympanoplasty by accessing eardrum and patching the hole **(Biswas et al., ٢٠٢٣).**

Nurses play critical and multifaceted role in the patient education after tympanoplasty for providing optimal patient care; such as avoid vigorous sports and exercise, heavy lifting and physical education activities for two weeks or more. The nose should not be blown for two weeks. Sneeze with an open mouth. Place a cotton ball in ear if notice a bit of blood coming from ear. Call provider if more bleeding than normal. Don't blow nose for at least three weeks after surgery. during sneezing, keep mouth open. Keep ear dry. No shower or washing hair for the first few days after surgery. During shower, place a cotton ball soaked with Vaseline in the ear **(Ren et al., ٢٠٢٥).**

Also, postoperatively, the nurse monitors for potential complications, such as infection or hearing loss, and provides pain management, wound care, and emotional support. By advocating for the patient and ensuring the proper follow-up, in conclusion, nurses ensure that the patient not only receives the best possible clinical care but also experiences a smoother, less stressful recovery. Through their attention to detail and compassionate care, nurses help ensure that the goals of tympanoplasty restoring hearing and improving quality of life are successfully met (National Center for **BiotechnologyInformation,(٢٠٢٣).**

Significance of the study:

According to the ٢٠٢١ World Health Organization (WHO) World Report on Hearing, the number of people with hearing loss worldwide exceeds ١.٥ billion. Hearing loss has become the third-largest type of disability globally. The WHO report has recognized the harm caused by hearing loss and the importance of universal hearing

healthcare **(Wang et al., ٢٠٢٥).** A national household survey conducted in Egypt estimated the prevalence of hearing loss at ١٦.٠ %, with rates increasing significantly with age. The highest prevalence was found among individuals aged ٦٥ years and older (٤٩.٣ %) **(Saber et al., ٢٠٢٥).**

Aim of the study: -

The study aimed to evaluate the effect of the nursing instructions on patients' health outcomes post tympanoplasty

Study hypotheses

The following research hypotheses are formulated:

H١: knowledge score of the studied patients post implementation of nursing instructions could be significantly increased than before.

H٢: Self-care practice score of the studied patients post implementation of nursing instructions could be significantly increased than before.

H٣: Studied patients could be attained positive health outcomes post implementation of nursing instructions

Research design:

Quasi-experimental pre and post intervention study design implemented to achieve the aim of the study

Setting:

This study was conducted in otolaryngology department and outpatient clinic at Benha University Hospital, Benha, Qalyubia Governorate, Egypt. Otolaryngology department is in the fourth floor, that includes one room contains six beds; three beds for male patients and three beds for female patients and there was a room in second floor in hotel building to follow and care of patients post tympanoplasty (work schedules of outpatient clinic on Saturday, Tuesday and Thursday /week from ١١ pm to ٣pm).

Sample:

Purposive sample of ٨٠ adult patients post tympanoplasty, from both sexes and their age ranging from ٢١-٦٠ years old. Who are able to communicate and agree to participate in the study.

Exclusion criteria

- The study excluded patients with cancer
-Definite diagnosis of cholesteatoma and ossicular erosion.
- Loss of consciousness.

Tools of data collection:

Four tools were used to collect data for this study as follows:

Tool I: Structured interview questionnaire:

It was designed by the researcher through reviewing of recent related literatures & scientific references **(Indorewala et al,. ٢٠١٥, Dogan& Bayraktar, ٢٠١٧ &Carniol et al,. ٢٠١٨)** and it was consisted of ٣١multiple choice questions and divided into three parts as the following:

Part (١): Patients' personal data:

It aimed to assess patients' personal data. It included ٧ questions about age, gender, residence, marital status, level of education, and occupation.

Part (٢): Patients' health history: It included ٦ questions about medical and surgical history as diagnosis, patient' present and past history, patient' complaint.

Part (٣): Patients' knowledge assessment: This part was concerned with assessment of patients' knowledge regarding: tympanic membrane perforation and tympanoplasty and it included a set of ١٨ MCQ questions as regard, definition, causes or risk factors, signs and symptoms and treatment of tympanic membrane perforation as well as post tympanoplasty complications, post tympanoplasty management, and post-operative instructions. It consisted of the following three sections:

Section I Covered the studied patients' knowledge about tympanic membrane perforation "٤ questions."

Section II Included the studied patients' knowledge about tympanoplasty "٩ questions."

Section III Included the studied patients' knowledge about complication of tympanoplasty "٥ questions."

Scoring system for knowledge assessment:

Patients' answer for each question in this questionnaire was checked with model key answer one score was given for each correct

answer and zero score for the incorrect answer& for the unanswered question. The total score for knowledge questions was ١٨ score which equal ١٠٠٪. The total scores of knowledges were summed up, converted into a percentage and classified as follows **Ibrahime, et al(٢٠٢١).,**

Good know hospitalization ledge if total score ≥ ٧٥٪ (١٣.٥-١٨ score) .

Average knowledge if total score ٥٠٪- < ٧٥٪ (٩-< ١٣.٥ score)

Poor knowledge if total score < ٥٠ % (Less than ٩ score)

Tool II: Patients' self-care practice assessment:

This tool was designed by the researcher after reviewing of recent relevant literature **(Naderpour et al,.٢٠١٦, Sheikh ,٢٠١٨, Son et al,. ٢٠١٨ &Aristizabal etal,. ٢٠١٩),** it aimed to assess patients' self-care practice pre and post implementing of nursing instructions post tympanoplasty. It included ٤١MCQ questions about how to deal with the wound post tympanoplasty, how to deal with pain and medications, precautions that must be followed post tympanoplasty, follow-up after discharge from the hospital.

Scoring system for self-care practice assessment:

Every practice done was scored a score of ١or ٠ where not done.

The total patients' self-care practice score was (٤١ score). The total patients' practice scores were converted into a percent and categorized into two levels as follows Eldesoky& Mahmoud, (٢٠١٩).

- Satisfactory ≥٧٥٪ of total score (٣١ -٤١ score).
- Unsatisfactory <٧٥٪ of total score (below ٣١ score).

Tool III: Hearing Handicap Inventory for Adults (HHIA) Scale:

This tool was adopted from **Cassarly et al., (٢٠٢٠),** and designed by the researcher after reviewing literature and jury opinions. It aimed to assess patients' behavior and emotional responses of the individual in relation to this hearing loss. It included ٢٥ closed ended questions about social and emotional responses. The revised hearing handicap inventory and screening tool based on psychometric reevaluation of the hearing handicap inventories for the elderly and adults.

Scoring system

The scale was graduated from ٠ to ٢ where zero referred to if yes, (١) referred to if sometimes, (٢) referred to if No.

Tool IV: Post-operative complications assessment

This tool was adapted from **Agrawal et al., (٢٠٢١)** A study of preoperative and postoperative assessment of hearing following Type ١ Tympanoplasty) , the tool was composed of ٦ components and modified by the researcher to١١ components by adding allergy, bleeding, ear infection, hematoma, tinnitus. It was concerned with assessment of patients' post-operative complications within two weeks such as ear infection, loss of hearing, tinnitus, dizziness, taste disturbance, mouth dryness, facial paralysis, and hematoma, failure of the graft, allergy, bleeding.

Validity and reliability of tools

Tools' validity:

The tools and the instructions booklet were revised and ascertained by a panel of five experts from medical surgical nursing field, Faculty of Nursing, Benha University. Jury involved two professor and three assistant professors to test the relevance, comprehension, clarity, and applicability of tools' content. According to their opinion minor modifications of tools and instructions booklet were applied.

Tools' reliability:

Tools' reliability was tested statistically using Cronbach's alpha coefficient to assure that the tools were reliable before data collection. Reliability of **tool I** was which was ٠.٧٠٩. Reliability of **tool II** was ٠.٦١٥ Reliability of **tool III** was ٠.٦٢٤. Average reliability of **tool IV** was ٠.٦٧٣)₂ which indicating a good internal consistency of the used tools.

Pilot study

Pilot study was conducted on ١٠٪ of the study sample (٨ patients) with tympanoplasty of the total sample size in order to test

feasibility, clarity and applicability of the tools & booklet. Also, the pilot study had served to estimate the needed time for each patient to fill the questionnaires, minimal modification done, so the patients who were included in the pilot study were excluded from the study sample and replaced by others, it was done two months prior to data collection.

Ethical consideration:

The research approval was approved from Scientific Research Ethics Committee in Faculty of Nursing, Benha University with code number (REC-MSN-D١). An official permission obtained from medical director of Benha University Hospital and head nurse of surgical departments (male and female surgical department) and outpatient clinic at Benha University Hospital before starting the study after explanation of the purpose of the study

aim of this study The was explained to patients and they were assured that all information would be confidential and it would be used for research purpose only. Verbal and written consent was obtained from each participant enrolled into the study. Patients were informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time without giving any reasons.

Fieldwork :(Data collection)

The fieldwork was performed over a period of eight months started from the beginning of October, ٢٠٢٤ till the end of May, ٢٠٢٥. The study was conducted on four phases as the following:

١- Assessment phase:

During this phase the researcher interviewed each patient after his/her admission to the Hospital in the patients' room to maintained privacy, to collect baseline data on personal data, medical data and knowledge assessment using tool I for studied patients' pre-instructions implementation. Studied patients were assessed for patients' self-care practice using tool II, and assessed for hearing handicap using tool III.

٢- Planning phase:

The planning phase included the following:

- Determining patients' health status and educational needs based on results of assessment phase and preparing the educational instructions and preparing for educational and training sessions to meet these needs.
- Putting plan for carrying out the study based on patients' needs and collected data about the study setting.
- Determining teaching strategy that included the following teaching methods; lecture, discussion, pictures explanation, summarizing, and feedback.
- Determining teaching materials that included educational instructions booklet, teaching material was prepared e.g. demonstration, power point, data show and printed handout was helped in covering the theoretical and practical information.
- Determining timetable of educational sessions according to patients' circumstances.
- Determining the teaching place (department & outpatient clinics at Benha University Hospital).

The content of the educational program was designed to meet the patients' needs regarding knowledge, practice and minimize complications for patients post tympanoplasty. The general objective was to improve patients' knowledge, practice and health outcomes as well as minimize complications for patients post tympanoplasty. The form of booklet which was color printed and was supplemented by photos for more illustration to help patients to understand the content. It included two parts: The theoretical part; was about basic knowledge related to definition, signs, symptoms, causes, and methods of diagnosis and treatment of eardrum perforation , definition, indications, advantages, contraindications, and types, complications of tympanoplasty, factors that affect their occurrence and normal symptoms after tympanoplasty and the practical part; was about practical ear care skills after tympanoplasty, how to deal with pain through pharmaceutical and non-pharmacological

methods, instructions that must be followed after leaving the Hospital, modifications to the patients' lifestyle, and instructions .

٣- Implementation phase:

The implementation phase was achieved through the educational sessions. It was carried out into four sessions that included, two sessions for theory and two sessions for practice. The researcher dealed with all studied patients to avoid bias of data. Total number of the studied sample was ٨٠ patients. Thus, they were divided into ١٠ groups. Each group included ٨ patients in every session. The researcher was attended three days/week work schedules on Saturday, Tuesday and Thursday /week from ١١ pm to ٣pm) at otolaryngology department and outpatient clinic at Benha University Hospital.

Each session lasted for ٣٠-٤٠ minutes, started with a brief summary about what had been given through the previous session, then the objectives of the new topics, taking into consideration by using simple language to suite the level of all patients' education. Motivation and reinforcement during session were used in order to enhance motivation for the sharing in this, answered any raised questions and gave feedback. The final form of the pinned educational booklet was developed and given to each patient to ensure their understanding which implemented through ٤٠ sessions and total hours for all sessions ٢٠-٢٦ hours.

In the first session, the researcher introduced her-self, gave introduction on educational program and its importance and explained the objectives of the educational instructions. The patients received information about definition, signs, symptoms, causes, and methods of diagnosis and treatment of eardrum perforation.

In the second session, patients received information about definition, indications, advantages, contraindications, and types, complications of tympanoplasty, factors that affect their occurrence and normal symptoms after tympanoplasty

In the third session, patients carried out practical ear care skills after tympanoplasty.

In the fourth session, patients carried out and follow how to deal with pain through pharmaceutical and non-pharmacological methods, instructions that must be followed after leaving the Hospital, modifications to the patients' lifestyle, and instructions for periodic follow-up. Each session started with revision of knowledge or practice given in the previous session.

Discussion during the educational instructions' sessions were used to enhance learning. At the end of these sessions, the researcher informed the patients that they evaluated by the researcher immediately (٢weeks) from sessions.

٤- Evaluation phase: After the educational instructions, the researcher interviewed patients individually and evaluated them post ٢ weeks from implementation of educational instructions using the same pre-test tools patients' knowledge, assessment using (tool I part ٣), self-care practice using tool II, hearing handicap using tool III and post operative complications assessment using tool IV. Comparison between all patients' pre-test and post-test finding was done at the end of the study ٢ weeks to determine the effect of an educational instructions on minimizing complications for patients post tympanoplasty.

Results

Table (١) shows that, the personal data among studied patients, reveals that the age of ٥٠.٠٪ of them was ٤٠-<٥٠ years with a mean age of ٤٥.٧٤ ± ٧.٦١٣ years. Concerning gender, ٧٠.٠٪ of the studied patients were female. As for educational level, ٥٠.٠٪ of the studied patients had intermediate education, and working, as an employee as reported by ٦٠.٠٪ of them, moreover ٥٥.٠ % of them were married and residing in rural area.

Table (٢) shows that, the health history among studied patients, concerning current patient's history, ٦٥.٠٪ of them were diagnosed with ear drum perforation since more than three weeks, ٧٥.٠٪ had undergone

open surgery and the Length of hospital stay after surgery was ٢-٣ days as reported by ٨٠.٠٪ of the studied patients. Moreover ٣٠.٠٪ had experienced ringing in the ears, severe pain, and difficulty breathing as a complication after surgery. Regarding comorbid disease, ٦٥.٠٪ reported having chronic illness especially diabetes mellitus and hypertension among ٣٠.٨٪ of them. Whereas ١٠٠.٠٪ had no other ear diseases.

Table (٣) shows that, there was a statistically significant differences regarding basic knowledge about ear drum perforation between pre and post nursing instructions' implementation (p= ٠.٠٣٣*), in term of improvement in knowledge level. Where, causes of eardrum perforation and diagnostic methods of eardrum perforation were of the highest areas of correct knowledge post nursing instructions among ٩٠.٠٪ compared to ٤٠.٠٪ & ٣٥.٠٪, respectively pre instruction implementation (p value = ٠.٠١٩* & ٠.٠٤٥*, respectively).

Table (٤) displays that, there was a statistically significant differences regarding total patients' self-care practice after tympanoplasty between pre and post nursing instructions' implementation, in term of statistical significance improvement in self-care practice level. Where, dealing with the wound after tympanoplasty was of the highest area of satisfactory total self-care practice post nursing instructions' among ٧٥.٠٪ compared to ١٣.٨ % pre instruction implementation (p value = ٠.٠٣٩*).

Figure (١) shows that, there was a statistically significant differences regarding total patients' social and emotional responses in relation to hearing loss between pre and post nursing instructions' implementation (p= <٠.٠٠١**), in term of statistical significance improvement in total response level. Where, ٣٢.٥٪ had mild to moderate level post instructions and ٠.٠٪ of them had significant handicap level compared to pre nursing instructions' where ٩٠.٠٪ of them had mild to moderate level as well as ١٠.٠٪ had significant handicap level

Table (٥) shows that there was a statistically significant differences regarding to incidence of post operative complications between during hospitalization and post two weeks in term of lower incidence within two weeks post discharge. Where, the highest incidence of complications was bleeding among ٧٠.٠٪ of patients during hospitalization compared to its incidence within two weeks post discharge.

Table (٦) shows that, Multivariate linear regression model in this table presents that social and emotional responses of hearing handicap among the studied patients were best predicted by their age, presence of comorbid disease, incidence of complications, marital status, self-care practices and knowledge level (p= <٠.٠٠١**, <٠.٠٠١**, <٠.٠٠١**, ٠.٠١٦*, ٠.٠٠٦*& ٠.٠١٩*, respectively), accounting for ٧٧.٦ % of the variance of social and emotional responses.

Part I: Personal data and health history of the studied patients

Table (١): Frequency distribution of the studied patients regarding personal data (n=٨٠).

Patient's personal data	(No.)	%
Age (in years)		
21- <30 year	12	15.0
30-<40 year	20	25.0
40-<50 year	40	50.0
50- 60 year	8	10.0
Mean ± SD	45.74 ± 7.613	
Gender		
Male	24	30.0
Female	56	70.0
Marital status		
Single	16	20.0
Married	44	55.0
Widowed	8	10.0
Divorced	12	15.0
Educational Level		
Can't read and write	12	15.0
Compulsory education	4	5.0
Intermediate education	40	50.0
University education	24	30.0
Working status		
Working	40	50.0
Not working	40	50.0
If yes, the work is (n= 40)		
Employee	24	60.0
Farmer	8	20.0
Mannual works	8	20.0
Residence		
Rural	44	55.0
Urban	36	45.0

Table (٢): Frequency distribution of the studied patients according to their health history (n=٨٠).

Items	Patients' health history	(No.)	%
	Current patient history		
Time since diagnosis with ear drum perforation			
	Two weeks	٨	١٠.٠
	Three weeks	٢٠	٢٥.٠
	More than three weeks	٥٢	٦٥.٠
Type of performed surgical procedure			
	Surgical opening	٦٠	٧٥.٠
	Laparoscopic	٢٠	٢٥.٠
Length of Hospital stay after surgery			
	٢-٣ days	٦٤	٨٠.٠
	٤-٥ days	١٢	١٥.٠
	More than week	٤	٥.٠
Complications experienced after surgery #			
	No	٤	٥.٠
	Bleeding from the ear	٢٠	٢٥.٠
	Ringing in the ears	٢٤	٣٠.٠
	Severe pain	٢٤	٣٠.٠
	Difficulty breathing	٢٤	٣٠.٠
	High body temperature	٢٠	٢٥.٠
	Dizziness	٤	٥.٠
	Fainting	٤	٥.٠
Presence of comorbid disease	**Previous history**		
	Yes	٥٢	٦٥.٠
	No	٢٨	٣٥.٠
If yes, the disease is (n=٥٢) #			
	Diabetes mellitus	١٦	٣٠.٨
	Hypertension	١٦	٣٠.٨

	Coronary heart disease	١٢	٢٣.١
	Liver disease	٨	١٥.٤
	Respiratory disease	٨	١٥.٤
Suffer from other ear diseases	**Suffer from other ear diseases**		
	No	٨٠	١٠٠.٠

(#) Not mutually conclusive

Table (٣): Comparison between pre and post nursing instructions' regarding their total main knowledge items among studied patients (n=٨٠).

Total main items knowledge	**Pre-nursing instructions (n=٨٠)**				**Immediately Post nursing instructions (two weeks) (n=٨٠)**				**x^2 test**	**P value**
	Satisfactory ≥ ٧٥٪		Unsatisfactory < ٧٥٪		Satisfactory ≥ ٧٥٪		Unsatisfactory < ٧٥٪			
	No.	%	No.	%	No.	%	No.	%		
Basic knowledge regarding ear drum perforation	١٥	١٨.٨	٦٥	٨١.٢	٦٤	٨٠.٠	١٦	٢٠.٠	٤.٦١٥	٠.٠٣٣*
Knowledge regarding tympanoplasty and postoperative instructions	١٩	٢٣.٨	٦١	٧٦.٢	٦٧	٨٣.٨	١٣	١٦.٢	٤.٨٣٥	٠.٠٣١*
Complications post tympanoplasty	٢٤	٣٠.٠	٥٦	٧٠.٠	٦٦	٨٢.٥	١٤	١٧.٥	٧.٢٧٣	FE ٠.٠٠٨*

FE Fisher's exact test (*) Statistically Significant at ≤٠.٠٥

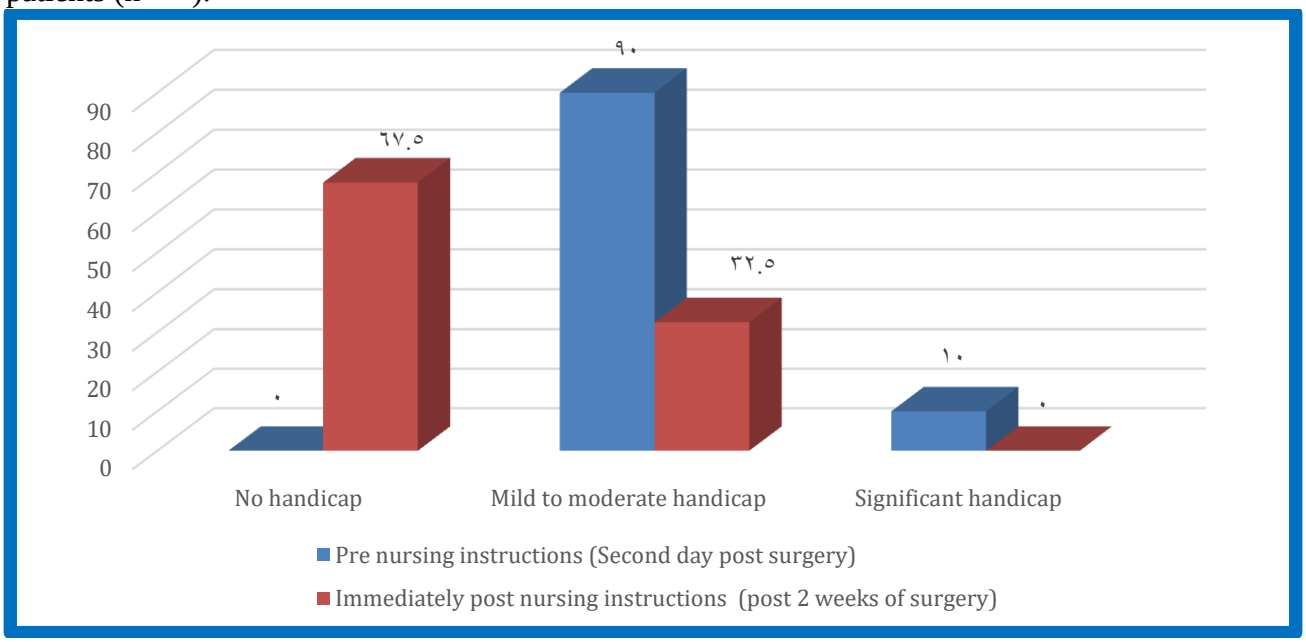
Table (٤): Comparison between pre and post nursing instructions' regarding their total main self-care practice items among studied patients (n=٨٠).

Total patients' self-care practice	**Pre-nursing instructions (n=٨٠)**		**Immediately Post nursing instructions (two weeks) (n=٨٠)**		**x^2 test**	**P value**
	Satisfactory ≥ ٧٥٪	**Unsatisfactory < ٧٥٪**	**Satisfactory ≥ ٧٥٪**	**Unsatisfactory < ٧٥٪**		

	No.	%	No.	%	No.	%	No.	%		
Dealing with the wound after tympanoplasty	١١	١٣.٨	٦٩	٨٦.٢	٦٠	٧٥.٠	٢٠	٢٥.٠	٤.٢٥١	٠.٠٣٩*
Dealing with pain and medications after tympanoplasty	٨	١٠.٠	٧٢	٩٠.٠	٥٥	٦٨.٨	٢٥	٣١.٢	٤.٠٤٠	٠.٠٤٤*
Precautions that must be followed after tympanoplasty	٨	١٠.٠	٧٢	٩٠.٠	٥٢	٦٥.٠	٢٨	٣٥.٠	٤.٧٨٦	٠.٠٢٩*
Follow-up after discharge from the hospital after tympanoplasty	١٠	١٢.٥	٧٠	٨٧.٥	٥٣	٦٦.٢	٢٧	٣٣.٨	٥.٨٢٢	٠.٠١٦*
lifestyle after tympanoplasty	٩	١١.٢	٧١	٨٨.٨	٥٧	٧١.٣	٢٣	٢٨.٧	٤.٠٩٢	٠.٠٤٣*

(*) Statistically Significant at ≤٠.٠٥

Figure (١). Comparison between pre and post nursing instructions' regarding their total social and emotional responses in relation to hearing loss among studied patients (n=٨٠).



. ****Highly significant at p ‹٠.٠٠١.**

Table (٥): Frequency distribution of the studied patients regarding incidence of post operative complications (n=٨٠).

Postoperative complications	During hospitalization		within two weeks post discharge (n=٨٠)	
	Yes	No	Yes	No

	No. (%)	No. (%)	No. (%)	No. (%)
Loss of hearing.	٨(١٠.٠)	٧٢(٩٠.٠)	٠ (٠.٠)	٨٠(١٠٠.٠)
Dizziness	٤٠(٥٠.٠)	٤٠(٥٠.٠)	١٦(٢٠.٠)	٦٤(٨٠.٠)
Ear infection	٥٢(٦٥.٠)	٢٨(٣٥.٠)	٣٥(٤٣.٨)	٤٥(٥٦.٢)
Taste disturbance	١٢(١٥.٠)	٦٨(٨٥.٠)	٠ (٠.٠)	٨٠(١٠٠.٠)
Mouth dryness.	٤(٥.٠)	٧٦(٩٥.٠)	٠ (٠.٠)	٨٠(١٠٠.٠)
Facial paralysis.	١٢(١٥.٠)	٦٨(٨٥.٠)	١(١.٢)	٧٩(٩٨.٨)
Hematoma	٨(١٠.٠)	٧٢(٩٠.٠)	٤(٥.٠)	٧٦(٩٥.٠)
Failure of the graft	٨(١٠.٠)	٧٢(٩٠.٠)	٤(٥.٠)	٧٦(٩٥.٠)
Tinnitus	٤٤(٥٥.٠)	٣٦(٤٥.٠)	١٢(١٥.٠)	٦٨(٨٥.٠)
Bleeding	٥٦(٧٠.٠)	٢٤(٣٠.٠)	٢٩(٣٦.٣)	٥١(٦٣.٧)
Allergy	١٦(٢٠.٠)	٦٤(٨٠.٠)	٠ (٠.٠)	٨٠(١٠٠.٠)

Table (٦): Regression of predictor variables for social and emotional responses of hearing handicap among studied patients post nursing instructions' implementation (n=٨٠)

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	٤٨.٩٥٥	٣.٢٤٠		١٥.١٠٨	.٠٠٠
Age	-١.٣٩٣-	.٢٤٧	-.٧٧٥-	-٥.٦٢٩-	<٠.٠٠١**
Gender	١.٢١٤	.٦٧١	.٣٥٨	١.٨٠٨	.٠٧٥
Marital status	.٤٩٨	.٢٠٠	.٢٩٧	٢.٤٨٢	.٠١٦*
Educational level	-.٠٩٣-	.١٥٨	-.٠٥٨-	-.٥٨٨-	.٥٥٨
Working status	.٧٥٨	.٤٧٥	.٢٤٤	١.٥٩٦	.١١٥
Time since diagnosis	-.٤٥١-	.٤٢٦	-.١٩٤-	-١.٠٥٩-	.٢٩٣
Period of hospitalization	-.٠٧٠-	.١٠٠	-.٠٧٧-	-.٦٩٥-	.٤٨٩
Presence of comorbid disease	-٢.٤٥٢-	.٤٠٤	-١.١٢٨-	-٦.٠٧٣-	<٠.٠٠١**
Knowledge level	.٩٣٢	.٣٨٧	.٣٧٣	-٢.٤٠٨	.٠١٩*
Self care practices	-.١٨٦-	.٠٦٥	-.٣٢٧-	-٢.٨٦٥-	.٠٠٦*
Incidence of complications	١.٢٩٣	.٣١٨	.٤١٣	٤.٠٦٥	<٠.٠٠١**
Adjusted R^2 = ٠.٧٧٦			**P value = <٠.٠٠١****		

(SEB) Standard Error B) Beta Co-Efficient **Highly significant at p ≤٠.٠٠١. * Significant at p ≤٠.٠٥

Discussion

Concerning the age, the current study findings showed that half of the studied patients were in age was ٤٠-<٥٠ years with a mean age of ٤٥.٧٤ ± ٧.٦١٣ years.

From the researcher point of view, this result may be because in this age patients are more susceptible to eardrum perforation because tissue weakness with age ischemic blood supply poor circulation in the can lead to slower tissue healing, making the eardrum more fragile and more susceptible to perforation when injured or infected. The immune system weakens with age, increasing the risk of middle ear infections. This infection can lead to increased pressure inside the ear, causing a perforated eardrum. improper use of ear cleaning tools, older adults sometimes use cotton swabs or sharp tools unsafely due to poor eyesight or balance issues, which can cause accidental puncture with age, the body's tissues, including the

eardrum, lose their elasticity, making them less able to with stand pressure or shock., including deterioration in hearing.

This result was consistent with **Tshifularo(٢٠٢٢),**who conducted a study entitled " Tympanoplasty success based on surgeon and patient-reported outcomes perspectives: a ١٠-year review in a tertiary center "and stated that majority of patients were between the age of ٢٦ and ٤٥ years.

Also, this result was consistent with **Redkar, et al., (٢٠٢٥),** who carried out a study entitled " Age-related impact on tympanoplasty results in adult individuals "and stated that half of the studied patients were more than ٤٠ years.

Furthermore,this result was accordance, **Salvador, et al .,(٢٠٢١),**who conducted a study entitled " Type I tympanoplasty: surgical success and prognostic factors " and reported that Patient age ranged from ١٨ to ٦٩ years, with a mean age of ٣٩.٧ ± ١٤.١ years.

Also, this result was accordance **Muniraju&Hegde(٢٠٢٠),**who conducted a study entitled " A comparative study of preoperative and postoperative hearing after type I tympanoplasty using temporalis fascia graft at Dr. BR Ambedkar Medical College, Bengaluru "and found half of the studied patients were in age was ٤٠-<٥٠ years.

While this result was in the contrary with, **Jaiswani, et al., (٢٠٢١)**,who conducted a study entitled " Does age of patient impact the outcome of tympanoplasty? A study in a tertiary care center " and reported that majority of studied patients were ٢٠ years.

Owing to sex, result of the present study revealed that about more than two third of the studied patients were females, from the researcher point of view, due to the frequent and sometimes incorrect use of ear cleaning tools such as cotton swabs, which causes a direct scratch or perforation of the eardrum, pushing the wax inwards and causing blockage and inflammation, leading to weakness and rupture of the eardrum.

This result was supported by **Al Busaidi & Al Rahbi(٢٠٢٤),**who conducted a study entitled " Outcome of type ١ tympanoplasty in Al Nahdha Hospital and influencing factors: A retrospective study "and found that more than half of patient were female.

This result was supported by **Tshifularo, (٢٠٢٢),** and reported that more half of the studied patients were female.

In addition, **Arndt, et al., (٢٠٢٥),** who conducted study entitled " Long-term outcomes of tympanoplasty with persistent air-bone gap in adults with chronic otitis media: hearing, health care utilization and quality of life "and reported that three quarters of the studied patients were female.

Furthermore, **Asfaha, et al., (٢٠٢٥),** who conducted study entitled " Tympanoplasty in Northern Ethiopia: success rates, failure factors, and audiometric improvements ". . and reported that two third of the studied patients were female

While this result was in the contrary with **Salvador, et al., (٢٠٢١),** who reported that majority of the studied patients were male.

Regarding marital status, results of the present study revealed that more than half of the studied patients were married. From the researcher point of view, this result may be because due to lack of interest in personal health after marriage and preoccupation with family responsibilities, they may neglect ear symptoms such as secretions or pain, which leads to the development of a perforated eardrum.

This result was agreed with **Badruddin, et al., (٢٠٢١)**, who conducted study entitled " Time to success and Its prognostic factors among patients with myringoplasty surgery "and reported that three fifth of the studied patients were married.

Concerning the educational level, results of the present study illustrated that half of the studied patients had intermediate education, from the researcher point of view, this result may be because lack of health awareness, People with average education may not have the same level of medical or health knowledge, which causes them to use inappropriate ear cleaning tools (such as cotton swabs, pins, or even pens), Ignore the symptoms of ear infections or fail to

recognize their seriousness, leading to their progression and perforation of the eardrum. Not knowing the difference between a simple infection and a condition requiring immediate medical treatment. Lack of regular checkups, some people only see a doctor when the problem worsens. Thus, ear infections may develop without early treatment, leading to fluid accumulation behind the eardrum and increased pressure, leading to a perforation.

This result was in accordance with **Ibrahime, et al., (٢٠٢١)**, who conducted study entitled " Effect of designed nursing guidelines on outcomes of patients undergoing tympanoplasty"and reported that majority of the studied patients had secondary education.

Owing to the occupation, results of the present study illustrated that three fifth of the studied patients were working, as an employee, from the researcher point of view, this result may be because many employees use headphones or earbuds for extended periods of time while working, especially in call centers office jobs that require continuous calls or online meetings this can lead to excessive sound pressure in the ear recurrent ear canal infections due to poor ventilation or pollution, which can later lead to a perforated eardrum. Working in environments with noise or air pressure such as factory employees, airports workshop these environments may cause sudden pressure changes or loud noises that affect the middle ear and may lead to a ruptured eardrum if appropriate hearing protectors are not used, neglecting to see a doctor, employees are often busy and stressed at work.

This result was in accordance with,**Ma, et al., (٢٠٢٤),** who conducted study entitled " Therapeutic effect of tympanoplasty on patients with chronic otitis media with tinnitus and influencing factors".and reported that majority of the studied patients working.

While this result was in the contrary with **Ibrahime, et al ., (٢٠٢١),** who reported that majority of the studied patients not working

Also, this result was in the contrary with **Li, et al (٢٠٢٠),**who conducted a study entitled " Analysis on the correlation between eustachian tube function and outcomes of type I tympanoplasty for chronic suppurative otitis media"and found that large percentage of patients undergoing tympanoplasty was not work.

Pertaining residence, results of the present study illustrated that more than half of the studied patients resided in rural areas. From the researcher point of view health awareness in rural areas, awareness of ear health problems and the importance of treating ear infections early is reduced. Many people ignore the symptoms of ear infections, which can lead to the development of inflammation and a perforated eardrum. Some people in rural areas may use traditional or non-medical treatments, such as inserting oils or herbs into the ear, which can cause direct damage to the eardrum. Delay in seeking treatment, poor hygiene and water, Poor environmental conditions, such as water pollution and poor personal hygiene, can lead to increased rates of infections, including ear infections.

This result was in accordance with **Younis, et al., (٢٠٢٥)**, who conducted study entitled " outcomes of myringoplasty operation in dry and wet ears in adults "and reported that three fifth of the studied patients resided in rural areas.

Current patient history

Owing to Time since diagnosis with ear drum perforation, results of the present study illustrated that nearly two third of the studied patients were diagnosed with ear drum perforation since more than three weeks, this result was in accordance with **Charoensawatsiri, et al.,(٢٠٢٥).** conducted study entitled " Incidence of tympanic membrane perforation affected by intratympanic steroid injection" and found that majority of the studied patients were diagnosed with ear drum perforation since more than four weeks.

Concerning type of performed surgical procedure, results of the present study illustrated that three quarter of the studied patients had undergone open surgery. From the researcher point of view better access to specific areas within the ear large or

peripheral holes (close to the ear canal wall) are more difficult to access with an endoscope. Traditional surgery gives the surgeon greater freedom of movement and a deeper view. Lack of experience or equipment in some centers about Laparoscopic surgery is needed some hospitals or surgeons are not sufficiently trained to use an otoscope and they do not have the necessary precision equipment, so they resort to microsurgery. The endoscope requires only one hand. When using the endoscope, one hand holds the camera, and the other performs the surgery. In complex cases, the surgeon needs to use both hands precisely, which is difficult with the endoscope.

This result was in accordance with **Lin, et al., (٢٠٢٤)** who conducted study entitled " Ergonomics of various modalities for ear surgery"and found that most of the studied patients had undergone open surgery.

Regarding length of Hospital stay after surgery, results of the present study illustrated majority of the studied patients' length of hospital stay after surgery was ٢-٣ days, From the researcher point of view the procedure itself is uncomplicated in most cases. Tympanoplasty usually takes ١ to ٢ hours. The procedure itself is uncomplicated in most cases. Tympanoplasty usually takes ١ to ٢ hours and Primary recovery takes place at home and to reduce costs and infections.

This result was in accordance with **Tan, et al., (٢٠٢١)** , who conducted study entitled " Application of enhanced recovery after surgery in perioperative period of tympanoplasty and mastoidectomy"and found that the length of postoperative Hospital stay decreased for most patients.

Also, this result was in accordance, **Kawale, et al., (٢٠٢٣)** , who conducted study entitled " Endoscopic versus microscopic type ١ tympanoplasty (myringoplasty) in a rural tertiary care hospital in india "and found that most of the patients discharged on postoperative days ٢ and ٣.

Owing to complications experienced after surgery, results of the present study illustrated less than third of the studied patients had experienced ringing in the ears(tinnitus), severe pain, and difficulty breathing as a complication after surgery, From the researcher point of view pain common expected due to surgical intervention in the middle ear, with an incision made in the ear canal or behind the ear, also Pain occurs as a result of local irritation and mild inflammation or swelling after surgery. Tinnitus is a common symptom after surgery due to irritation of the auditory nerve, changes in pressure within the middle ear and presence of fluid or temporary infection after surgery. Difficulty breathing is a common symptom after surgery as a side effect of anesthesia.

This result was in accordance with **Ahmad, et al., (٢٠٢٤)** , who conducted study entitled " Endoscopic double flap tympanoplasty", and found that third of the studied patients had experienced post operative pain. Also, this result was in accordance, **Reynders, et al., (٢٠٢٥)** , who conducted study entitled " Outcomes of tympanoplasty with an autologous two-piece perichondrium-cartilage graft in a tertiary care setting". who found that the most common complications in patients were pain.

This result was in accordance with **Reynders, et al., (٢٠٢٥)** ,who illustrated that quarter of the studied patients had experienced ringing in the ears.In addition this result was in accordance with **Tan, et al., (٢٠٢١),**who illustrated that patients had difficulty breathing post tympanoplasty.

While this result was in the contrary with **Tan, et al., (٢٠٢١),** who illustrated that pain reduce and improve comfort.

Also, this result was in the contrary with **Samarei, et al., (٢٠٢٤)**, who conducted a study entitled " Comparing success rate of two surgical approaches of tympanoplasty in patients with chronic otitis media "and illustrated that pain reduce.

Furthermore, result was in the contrary with **Yeh, et al ., (٢٠٢٥)**, who conducted a study entitled " The impact of tympanoplasty on tinnitus improvement in Patients with chronic otitis media", and illustrated that patients experienced a reduction in tinnitus severity following tympanoplasty.

Also, this result was in the contrary with **Gupta & Singh (٢٠٢٥)**, who conducted study entitled " Assessment of quality of life in chronic otitis media patients undergoing type I tympanoplasty"and illustrated that patients reported no tinnitus postoperatively.

Previous history:

Regarding presence of comorbid disease, results of the present study illustrated nearly two third of the studied patients had reported having chronic illness especially diabetes mellitus and hypertension. From the researcher point of view diabetes causes damage to small blood vessels, especially in the middle ear, this reduces blood flow to the eardrum, making it more fragile and less able to resist infection or heal, also diabetes causes slow wound healing even a small perforation in the eardrum may not heal in a diabetic patient because tissue regeneration is impaired. The middle ear contains a delicate network of blood vessels so hypertension Increased intravascular pressure.

This result was in accordance with **Sajid, et al., (٢٠٢١)**, who conducted a study entitled"Magnitude of diabetes mellitus in patients of sudden sensorineural hearing loss and its effect on corticosteroid therapy " and illustrated that most of the studied patients had diabetes mellitus.

Also, this result was in accordance with **Malas, et al (٢٠٢٥)** , who Conducted a study entitled " fascia tympanoplasty: A tertiary center experience". and found that two third of patients had a documented history of diabetes mellitus and majority of patients had a diagnosis of hypertension.

Furthermore, this result was in accordance with, **Tshifularo,(٢٠٢٢)** , who found that factors that were statistically insignificant in affecting graft take such as the presence of comorbidities such as diabetes mellitus

This result was in the contrary with **Arndt, et al., (٢٠٢٥)** , who conducted study entitled " Long-term outcomes of tympanoplasty with persistent air-bone gap in adults with chronic otitis media: hearing, health care utilization and quality of life" and illustrated that most of the studied patients no had diabetes mellitus.

Owing to suffer from other ear diseases, results of the present study illustrated most of the studied patients had no other ear diseases, this result was in accordance with **Devi, et al., (٢٠٢١)**, who conducted study entitled " Effect of type ١ tympanoplasty on the quality of life of patients suffering from chronic otitis media (safe type) "and illustrated that majority of the studied patients had no other ear diseases.

Owing to total knowledge level pre and post nursing instructions', results of the current study revealed that there was a statistically significant differences regarding total patients' knowledge about tympanic membrane perforation and tympanoplasty between pre and post nursing instructions implementation,in term of improvement in knowledge level. Where, knowledge regarding tympanoplasty and postoperative instructions was of the highest area of satisfactory total knowledge post nursing instructions. From the researcher point of view, this result may be because nursing instructions had great role in improving total knowledge of studied patients and this reflected importance of post nursing instructions' in raising level of knowledge among patients and the need for continuous refreshment of their knowledge, most patients have a strong desire to learn more knowledge about their conditions and also showed the effect of the nursing instructions'.

This results came in agreement with **Ibrahime et al.,(٢٠٢١),** who illustrated both study and control group patients didn't have enough knowledge before nursing instructions 'after application nursing instructions', study group patients showed statistically significant improvement in their level of knowledge than the control group.

These results came in agreement with **Collinson, (٢٠٢٠)** , who conducted a study " entitled New Zealand speech language therapists' knowledge of hearing loss and perspectives on collaboration with the audiology profession" and found that before application the teaching guidelines all the studied sample were having poor knowledge, however after application the guidelines they

found significantly improve in knowledge level.

Regarding total main self-care practice items, result of the current study revealed, that there was a statistically significant differences regarding total patients' self-care practice after tympanoplasty between pre and post nursing instructions' implementation, there were significance improvement in self-care practice level.

This findings were agreed with **Yaseen, et al., (٢٠٢٠)** , who conducted a study entitled" Evaluation of graft taking and hearing threshold after tympanoplasty. " and showed that Patients were evaluated preoperatively and followed up for ٦ months postoperatively and found that improvement in self-care practice level.

Regarding total social and emotional responses in relation to hearing loss, result of the current study revealed that there was a statistically significant differences regarding total patients' social and emotional responses in relation to hearing loss between pre and post nursing instructions' implementation there was statistical significance improvement in total response level.

The findings of this study were agreed with **Jaglan, et al., (٢٠٢٥)** , who conducted a study entitled " Surgical outcomes in chronic otitis media: hearing and quality of life improvements" and showed that post-operative evaluations demonstrated significant improvements in both audiometric outcomes and QoL.

Post operative complications post nursing instructions'

Regarding incidence of post operative complications, result of the current study revealed that there was a statistically significant differences regarding to incidence of post operative complications between during hospitalization and within two weeks post discharge. Where, the highest incidence of complications was bleeding among ٧٠.٠٪ of patients during hospitalization compared to within two weeks post discharge (p value = <٠.٠٠١**).

The findings of this study were agreed with **Wu, et al (٢٠٢٣),**who conducted a study entitled "Predictors of Functional Outcomes and Recovery Time Following Tympanoplasty" and reported that incidence of post operative bleeding decreased between majority of patients.

Also, the findings of this study were agreed with **Moneir, et al (٢٠٢٣),**who conducted a study entitled "Correlation of Eustachian tube function with the results of type ١ tympanoplasty: a prospective study"and reported that majority of patients no have complications post tympanoplasty

Regression of predictor variables for social and emotional responses of hearing handicap among studied patients post nursing instructions' implementation

Multivariate linear regression model in this table presents that social and emotional responses of hearing handicap among the studied patients were best predicted by their age, presence of comorbid disease, incidence of complications, marital status, self-care practices and knowledge level (p= <٠.٠٠١**, <٠.٠٠١**, <٠.٠٠١**, ٠.٠١٦*, ٠.٠٠٦*& ٠.٠١٩*, respectively), accounting for ٧٧.٦ % of the variance of social and emotional responses.

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