

Effect of Post-Operative Nursing Instruction on Patient Outcomes undergoing Endoscopic Sinus Surgery

Shimaa Magdi Farghaly¹, Mishmisha El sayed Ibrahim Ramadan²

¹(Medical Surgical Nursing, Faculty of nursing/Cairo University-Egypt)

²(Medical Surgical Nursing, Faculty of nursing/Cairo University-Egypt)

Abstract

Background: Endoscopic sinus surgery is one of the commonest procedures performed by a rhinologist, there is no standardized approach to postoperative endoscopic sinuses surgery care. Also, there are numerous reported strategies and debate regarding the optimal postoperative care protocol. **The Aim** was to investigate the effect of postoperative nursing instructions on selected outcomes among patients undergoing endoscopic sinus surgery. **Subjects and Methods: Design:** A Quazi-Experimental posttest time series control group design. **Sample:** purposive sample of 60 adult patient's post endoscopic sinus surgery were recruited. **Setting:** The study was conducted at ENT departments at El Kaser El Aini hospital in Cairo. **Data was collected through:** Socio-demographic & medical data form, Knowledge assessment form, selected postoperative outcomes assessment form, and the numeric pain intensity scale. **Results:** the study result show an improvement in the knowledge score of the study group in the opposite for the control group between pre and post-intervention, in addition to the rate of postoperative outcomes after the first & second week. There was a statistically significant difference in pain mean score between before and after intervention among both groups. **Conclusion:** The implementation of post-operative nursing instruction was more effective in improving the total patient knowledge scores, decreasing the pain intensity, and the outcomes of the study group than the scores of the control group who received routine hospital care. **Recommendations** provide a postoperative nursing guideline for the patient undergoing endoscopic sinus surgery to improve the patient outcome.

Key Word: Functional Endoscopic Sinuses Surgery, Nursing Instructions, Postoperative Outcomes.

Introduction:

Chronic rhino sinusitis (CRS) is a disabling inflammatory disease of the Sino-nasal mucosa that causes symptoms of nasal congestion, discharge, facial pressure, and olfactory dysfunction. Chronic rhino-sinusitis is a common chronic disease and one of the most common reasons for patients to seek medical attention, and the cost to society is high in terms of health resource utilization, loss of productivity, and absenteeism from work. Despite extensive drug therapy, a subset of patients with refractory disease often requires surgical management in the form of endoscopic sinus surgery (ESS) (Kwon & O'Rourke, 2021). The World Health Organization ranks chronic respiratory disease as one of the top 4 health problems of humanity. Chronic rhino sinusitis (CRS)

affects more than 30% of the population worldwide. The socio-economic impact of chronic upper respiratory diseases in Europe is estimated at more than 150 billion euros per year. The prevalence of CRS in African countries is increasing due to increasing urbanization and pollution. Unmet needs in CRS can be identified in several areas: education, research, and clinical practice. Furthermore, the enormous socioeconomic burden of CRS on healthcare systems is expected to increase significantly in the future, justifying new healthcare policies at national and international levels (Albu, 2020). The earliest postoperative outcome for patients undergoing endoscopic sinus surgery is pain. Some patients experience severe pain after surgery, while others may experience significant pain for several days. Bleeding is common in the first few days after surgery

when bloody nasal discharge is seen. Some patients may notice dramatic improvements in their nosebleeds, facial pain, and edema immediately after surgery, while others may not notice any improvement for several days or weeks. Both experiences are normal. Post-surgery nasal congestion can be related to a number of factors, including packing, crusting, and normal post-surgery swelling (Thomas, & Sugirtha, 2021). The main goals of early postoperative care are to reduce mucosal inflammation and infection, short-term improvement in appointment patient symptoms, promote the early return of ciliary function, and prevent complications. After ESS, the milieu of old blood, exposed bone, unresorbed packing, and retained secretions may predispose to infection and inflammation and provide a potential setting for scarring and early disease recurrence (Khanna & Sama, 2019). The earliest postoperative outcome for patients undergoing endoscopic sinus surgery is pain. Some patients experience severe pain after surgery, while others may experience significant pain for several days. Bleeding is common in the first few days after surgery when bloody nasal discharge is seen. Some patients may notice dramatic improvements in their nosebleeds, facial pain, and edema immediately after surgery, while others may not notice any improvement for several days or weeks. Both experiences are normal. Post-surgery nasal congestion can be related to a number of factors, including packing, crusting, and normal post-surgery swelling (Litvac, 2018).

The postoperative nursing instructions in current study encourage the patients in the study group to perform activities, this was done in order to assist in helping them to be as independent as possible and to promote emotional sense of security, as well as helped the postoperative patients to become more adapted in personal care and gain confidence in their abilities to maintain domestic activities after hospitalization. Nurses play a central role in educating and supporting the patient. There is an urgent need to educate patients about the procedure at the time of scheduling the appointment. This helps in better understanding, as the stress on the day of the

procedure clouds the understanding and comprehension of the patients. In addition, the instructions are an effective strategy to improve the knowledge of patients undergoing endoscopy. This can be made more effective by using appropriate audiovisual aids and incorporating the experiences of patients who have already undergone the procedure (Thomas, & Sugirtha, 2021). The aim of the current study is therefore to investigate the effect of postoperative care instructions on selected outcomes in patients after endoscopic sinus surgery.

Significance of the study

Sinus surgery using a nasal endoscope is the most commonly recommended procedure when the medical therapy fails for people with chronic sinusitis. Endoscopic sinus surgery is one of the commonest procedures performed by a rhinologist. Over 250,000 ESS cases are performed annually in the USA (Khanna & Sama, 2019). In Egypt, according to statistical office of ENT 36 department at a university hospital in Cairo, Egypt (2021) about 3-4 patients are admitted to the section per week with chronic Rhino Sinusitis for ESS.

There is no standardized approach to postoperative endoscopic sinuses surgery care. Also, there are numerous reported strategies and debate regarding the optimal postoperative care protocol. Hence the primary goals of early postoperative care following endoscopic sinuses surgery are to reduce mucosal inflammation and infection, improve short-term patient symptoms, promote early return of ciliary function, and prevent complications. So different nursing interventions need to be investigated and an early postoperative care following endoscopic sinus surgery (ESS) has been suggested to minimize avoidable complications and minimize the outcomes like nose bleeding, facial pain and edema (Rudmik et, al. 2012).

Education and a patient-centered attitude are the key nursing steps towards a better management of chronic rhino sinusitis. The major responsibility of health care provider is to enhance the self-care by

demonstrating and instructing early postoperative care following endoscopic sinus surgery. The nursing role as a researcher is conducting a clinical trial to improve self-care among the patients additionally as an educator and counselor must assess the patient to demonstrate effective self-care. ENT nursing specialty is wide and very important area of nursing researches. Hopefully as a nursing researcher in medical surgical nursing specialty can develop scientific background knowledge about postoperative ESS care, add an evidence based nursing practice and increases awareness of health teaching, caring pre and post-operative ESS.

Operational definitions:

Post-operative nursing instruction: In the current study, refers to patient knowledge regarding postoperative precaution and avoidance, how to prevent the nasal swelling post-surgery, proper nutrition, warning signs as measured by knowledge assessment form.

Pain: In the current study, it refers to self-reported headache/facial pain as measured by numerical pain intensity scale (0-11) (Smeltez & Bare, 2017).

Outcomes: In the current study refers to some medical problems that may occur postoperatively as bleeding, infection, blockage, discharge, etc... as measured by postoperative outcomes assessment sheet. As well, knowledge as an outcome will be measured by knowledge assessment form.

Aim of the study

To investigate the effect of postoperative nursing instructions on selected outcomes among patients undergoing endoscopic sinus surgery as follow:

- Improve the mean knowledge score about postoperative intervention among the participants
- Decrease the rate of postoperative complications
- Decrease the mean score of pain

Research Hypotheses:

H1: The mean knowledge score of experimental groups will be different from the mean knowledge scores of the control groups.

H2: There will be a statistically significant difference in the pain intensity score between the control and experimental groups.

H3: The mean score of postoperative outcomes of experimental groups will be different from than mean scores postoperative outcomes of the control groups

Material and Methods:

Design:

Quasi-Experimental posttest time series control group design will be used to achieve the aim of the current study. This design is one of the experimental designs in which the study sample is divided into two groups, an experimental group (1) and a control group (2), the experimental group receives the experimental intervention and the control group receives the routine treatment and a posttest is given to both groups. Time Series Designs is a sub-type of quasi-experimental in which measurements of the same variables are taken at different points in time, often with a view to studying social trends. In the current study this design help to evaluate the effect of postoperative instructions (intervention / independent variable) , on selected postoperative outcomes (dependent variable) among patients undergoing endoscopic sinus surgery (ESS) (Moffatt et al., 2021).

Setting:

The current study was conducted at ENT 36 and 13 department in one of the governorate hospital in Cairo, Egypt. ENT 36 department is located in the third floor and consist of 4 rooms with 6 bed capacity in each. 13 department is located in the second floor and consist of 2 rooms with 8 bed capacity in each. The average duration in which the patient stayed at the hospital after surgery was 1–2 days.

Subjects & selection method: The study subjects was drawn from chronic rhino sinusitis patients who admitted to ENT 36 and 13 department in one of the governorate hospital in Cairo, Egypt and underwent FESS before surgery. The sample collected with 6 months but not less than 60 patients from November 2021 to May 2022, the participants were divided consecutively into two groups (each group had 30 patients) as follows:

Group I (N=30 patients) – study group took postoperative nursing instruction; and

Group II (N=30 patients) - control group took routine hospital care.

Inclusion criteria:

1. Either sex
2. Aged ≥ 18 years,
3. Patients with chronic rhino sinusitis (CRS) for the first time.
4. Undergoing sinus surgery by the rigid endoscope

Exclusion criteria:

1. Patients with bronchial asthma or allergy,
2. Patients had nasal polyps,
3. Patients complain of coagulation disorders,
4. Patients took anticoagulant medications
5. Patients with genetic disorders

Data Collection Tools :

The researchers utilized following tools to collect the relevant data:

First tool: Socio-demographic and medical data form developed by the researcher to collect data pertinent to age, gender, education, occupation, marital status & place of residence. Patients' past medical history, surgical history, family history, and reason for surgery.

Second tool: A knowledge assessment form was developed by the researcher after reviewing the related literature. It consists of 32 true/false questions divided into 5 major categories as the following: 7 questions to

collect data pertinent to wound dressing, 4 questions about proper nutrition, 5 questions about caring for swelling and pain, 10 questions about avoided activities after surgery, and 6 questions asking the patient about warning signs that needed for doctor consultation. **It was scored from** (0 - 1), (0) for the incorrect answer while (1) was given for the correct answer, while the total score was divided into two categories, more than 80 % indicated a satisfactory level of knowledge, while less 80% indicated an unsatisfactory level of knowledge, with Cronbach's alpha reliability (r) of 0.966 for the current study.

Third tool: Selected postoperative outcomes assessment form, it developed by the researcher after reviewing the related literature and consists of 9 yes or no questions to collect data pertinent to some post-operative health problems as bleeding, infection, vision problems, headache, etc... Hence, yes meant the patient complained of these health problems and no meant didn't complain with Cronbach's alpha reliability (r) of 0.812 for the current study.

Fourth tool: The numeric pain intensity scale was adopted from **Smeltez, Bare, Hinkle, Cheeve & Bare (2017)**. It is a 10-point scale scored from 0 to 10 for adult patients self-reporting pain intensity scores as 0 indicates no pain, 1-3 mild pain, 4-6 moderate pain, and 7-10 severe pain.

Ethical Consideration

The approval was obtained from the Research and Ethics Committee of the Faculty of Nursing - Cairo University (IRP Approval Number: 2019041701), and official permission was obtained from hospital administrators where the study was conducted. Moreover, Informed consent was obtained from each subject after explaining the nature and purpose of the study. The researcher emphasized that participation in the study was entirely voluntary and patients could withdraw from the study at any time without affecting the medical care they received. Moreover, the participants were informed that the data

collected will not be reused for any other research purpose without their permission.

Procedure methodology:

Official permission to conduct this study was obtained from Research and Ethics Committee of the Faculty of Nursing - Cairo University & the hospital director. The study was conducted throughout three phases; preparatory, implementation, and evaluation phase.

Preparatory phase: Firstly, the researcher conducted review of the related literature regarding postoperative ESS care and prepared the post-operative nursing instruction, prepared the tools for data collection and constructed the content validity. Once official approval was obtained from the hospital director and the head of the unit, then an initial interview was conducted with the patients who meet the inclusion criteria and they were informed about the nature and purpose of the study, then obtained written consent from those who agreed to participate.

Implementation phase: an individualized interview session was conducted by the researcher with each patient to collect the demographic and medical data from both groups. Firstly, the researcher started interviewing the experimental subjects the day before surgery in the surgical department, assessed the patient's knowledge about postoperative care, and then, the researchers explained and gave them pamphlet about postoperative instructions and reassess the patients' knowledge again at the end of the session. The time of interview was 30 to 45 minutes approximately.

Nursing instruction regarding postoperative included the following:

- How to follow the surgical site.
- What to do and what not to do following surgery.
- The patient's post-operative nutrition.
- The ways to reduce and avoid facial swelling.
- the warning signals and when to see a doctor.

As for the control group interviewed preoperative, collect the demographic and medical data, assessed for postoperative instruction, but received routine hospital care as preoperative preparation (took laboratory test, cannulation, checked by anesthetist.

Evaluation Phase: post-operative in the second day before discharge the researcher reassessed patient knowledge regarding postoperative care for experimental and control group using tool 2. The experimental and the control group were interviewed by the researchers during follow-up in the section/out-patient clinic or by telephone to monitor the selected postoperative outcomes after 1 and 2 weeks post-surgery using tool 3 and 4 and answered any question, the interview took about 15 to 20 minutes.

During the follow up if any problems arise with the participants, the researcher referred them to the physician and answer in query from the patient.

Statistical analysis

Obtained data was tabulated, computed and analyzed using statistical package for social sciences (SPSS) program version 25. Descriptive statistics including frequency and percentage distribution, mean and standard deviation utilized. Paired t-test was used to determine the difference between groups. Moreover. A probability level of 0.05 was adopted as the level of significance for testing all hypothesis.

Result:

Table (1) shows that (50%) of the control group' their age ranged between 18 < 30 years old with a mean age of 32.83 ± 8.64 years, and (40%) of the study group' their age ranged between 30 -< 40 years old with a mean age of 35.30 ± 10.20 respectively. The same table illustrated that (70%) of the control was male and (60%) of the study group was female. Regarding educational level (40% & 33.35%) of the control and study groups had a university education. Concerning marital status (70% & 80%) of the control and study group

were married, and 60% followed by 50% of the control and study group weren't working, in addition to 70% & 63.3% of them living in urban areas respectively.

Figure (1) showed that nasal obstruction and snoring during sleep (70% & 50%) were the most frequent reason for seeking surgery among the control group for seeking surgery to correct it while pain and headache (63.35% & 60%) were the most frequent cause for surgery among the study group.

Table (2) revealed that (80% & 83.3%) of the control and study groups were not smoking respectively, (90 % & 90%) followed by (80% & 70%) in both groups who didn't have medical or surgical history. Regarding the history of allergy to food or medication (86.7% & 93.3%) of the control and study group had no allergy to anything respectively.

Table (3) showed there was no meaningful reduction in the mean knowledge score for the control group between pre & post-intervention, and there were statistical differences in the mean

knowledge score for the study group between pre and post-intervention.

Table (4) that, nasal septal perforation, poor wound healing, anosmia, fever, eye swelling, and bleeding were the most frequent complication after the first week represented (60%, 40%, 40%, 40%, 20% & 20%) respectively followed by nasal septal perforation, anosmia, and bleeding represented (20%, 20% & 20%) after 2 weeks. Regarding the study group, the most frequent complication after the first week was poor wound healing, bleeding, anosmia, nasal septal perforation, and loss of taste represented (53.3%, 50%, 46.7%, 40%, & 30%) respectively followed by poor wound healing, nasal septal perforation, anosmia, loss of taste, and bleeding represented (16.7%, 6.7%, 6.7%, 6.7%, & 6.7%) after 2 weeks.

Table (5) illustrates that the mean scores of pain intensity in the study group pre-and post-intervention were (5 ± 2.61 & 1 ± 1.68 respectively). On the other hand, in the control group it was (7.40 ± 2.77 & 2.60 ± 2.45 respectively) pre-and post-intervention. It appeared from table 5 that there was a statistically significant difference in pain mean score before and after intervention among both groups ($P = .000$).

Table (1). Frequency and Percentage distribution of Demographic Characteristics for both group (n=60).

Variables	Control group N=30		Study group N=30	
	No.	%	No.	%
Age				
18-<30	15	50	9	30
30-<40	3	10	12	40
40-<50	12	40	4	13.3
50-<60	--	--	5	16.7
Mean \pm SD		32.83 \pm 8.64		35.30 \pm 10.20
Gender				
Male	21	70	12	40
Female	9	30	18	60
Level of education				
Can't read and write	--	--	5	16.7
Primary education	6	20	2	6.7
Preparatory education	3	10	4	13.3
Secondary education	9	30	9	30.0
University education or other	12	40	10	33.3
Marital status				
Single	9	30	5	16.7
Married	21	70	24	80.0
Widow	--	--	1	3.3
Occupation				
Not work	18	60	15	50.0
Work	12	40	15	50.0
Place of resident				
Rural	9	30	11	36.7
Urban	21	70	19	63.3

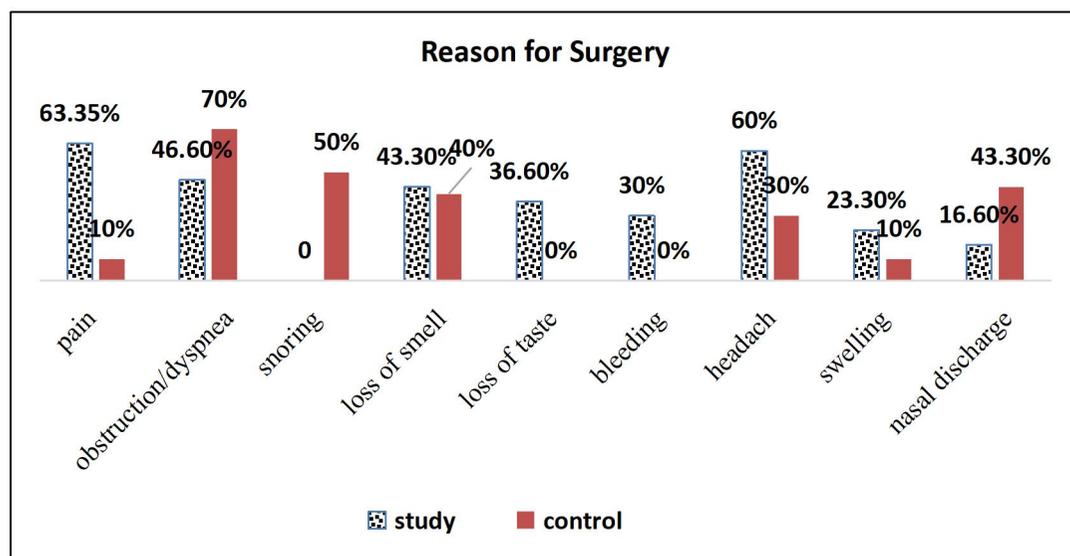
Figure (1) Percentage distribution for the reason of surgery (FESS) among the study sample (n=60)

Table (2). Frequency and Percentage distribution of selected medical related data for the study and control group (n=60)

Variables	Control group N=30		Study group N=30	
	No.	%	No.	%
Smoking				
Not smoking	24	80	25	83.3
Smoking	6	20	5	16.7
Past medical history				
Non	27	90	27	90.0
Diabetes	2	6.7	3	10.0
HTN	1	3.3	--	--
Past surgical history				
Non	24	80	21	70.0
Appendectomy	4	20	9	30.0
Thyroidectomy	1	3.3	--	--
Tonsillectomy	1	3.3	--	--
Allergy				
Non	26	86.7	28	93.3
Food	3	10	2	6.7
Medication	1	3.3	--	--

Table (3). Frequency and percentage distribution of mean knowledge score before and after intervention among both groups (n=30/each group)

Variables	Control group N=30				Study group N=30				T	P
	Before		After		Before		After			
	intervention	intervention	intervention	intervention	intervention	intervention	intervention	intervention		
	No.	%	No.	%	No.	%	No.	%		
Knowledge Level										
Satisfactory	3	10	3	10	9	30	29	96.7	.522	.000
Unsatisfactory	27	90	27	90	31	70	1	3.3		
Mean ± SD	32.8± 5.49		34.50± 9.33		41.03±12.47		60 ± 3.18			

Table (4). The deference of postoperative selected outcome after FESS among both groups (n=60).

Variables	Control group N=30				Study group N=30				T	Significant
	After week		After 2weeks		After week		After 2weeks			
	No.	%	No.	%	No.	%	No.	%		
Infection										
- Fever above 38	12	40	--	--	4	13.3	1	3.3		
-Purulent Discharge	3	10	3	10	6	20	1	3.3		
	Local Reactions									
-Nasal backing	--	--	--	--	3	10	--	--		
Changes in nasal sensation										
-Pain	3	10	--	--	11	36.7	1	3.3		
-Numbness	--	--	--	--	6	20	--	--		
-Loss of smell	12	40	6	20	14	46.7	2	6.7		
-Loss of taste	3	10	3	10	9	30	2	6.7		
Orbital Complications										
Blurred vision	3	10	--	--	1	3.3	--	--		
-Double vision	3	10	--	--	2	6.7	--	--		
-Loss of vision	--	--	--	--	1	3.3	--	--		
-Eye swelling	6	20	--	--	3	10	--	--		
Bleeding	6	20	6	20	15	50	1	6.7		
Nasal Obstruction	--	--	--	--	2	6.7	--	--		
Headache	18	60	6	20	12	40	1	6.7		
Poor wound healing	12	40	--	--	16	53.3	5	16.7		
T									-62.027	-85.893
Significant									.000	.000

Table (5). Mean and standard deviation of the numerical pain scale for the study and control group pre and post intervention (n=60).

Variables	Control group N=30				Study group N=30				T	Significant
	After week		After 2weeks		After week		After 2weeks			
	No.	%	No.	%	No.	%	No.	%		
Pain										
No pain	--	--	12	40	1	3.3	18	60	.546	.000*
Mild	3	10	6	20	9	30	9	30		
Moderate	6	20	12	40	12	40	3	10		
Sever	21	70	--	--	8	26.7	--	--		
Mean ± SD	7.40 ± 2.77		2.60 ± 2.45		5 ± 2.61		1 ± 1.68			

*High statistical significant difference P ≤0.05

Discussion:

Instructional guidelines, such as postoperative care, when added to current evidence-based practice, management, and discharge data, could offer a patient-centered strategy to enhance the standard of care. The current study found that two thirds of both groups were under the age of thirty, with mean ages of 32.83 ± 8.64 and 35.30 ± 10.20 years respectively, for the control and study groups. Additionally, two thirds of both groups were female, married, and residents of urban areas, while one third had a university degree and more than half were unemployed.

This conclusion conflicts with **Al-Abbasi, Al-Uraibi, and Atshan (2020)**, who discovered that almost two thirds of the study sample were men, and their ages ranged from forty to fifty years. According to **Akita et al. (2020)**, their participants had a median age of fifty-seven years and 60.6% were male. Our findings were confirmed by **Afolabi et al. (2020)**, who discovered that the participants in their study had an average age of 35.9 ± 1.9 years, with a higher incidence among young adults in their third and fourth decades of life. They also discovered that more females than males participated in the study, which supports our findings.

The most common symptoms among the study group in the current study sample prior to surgery were pain, headache, dyspnea/nasal obstruction, and loss of smell, while the control group complained of sleepiness, snoring, loss of smell, and nasal discharge. In a similar vein, **Afolabi et al. (2020)** noted that among the study samples, nasal discharge, nasal blockage, nasal growth, hyposmia/anosmia, and allergies were the most frequent causes of FESS surgery. Additionally, **Al-Abbasi et al. (2020)**, who mentioned that nasal obstruction, nasal discharge, chronic rhino sinusitis, and headache were the main presenting symptoms among their participants.

The current study demonstrates that the study group had a satisfactory level of knowledge postoperatively, but almost all of the control group hadn't. Besides, a statistically

significant difference was found between the groups. The researcher's opinion for a satisfactory level of knowledge about postoperative care and endoscopic sinus surgery among the study group was the written instructions, which were given to

Participants' early pre-surgery, giving them a chance to read and ask questions to the researcher during the follow-up sessions.

The current study's findings concur with **Hwang, Nayak, and Wang (2021)**, who found that the patient's active engagement in adhering to postoperative instructions was essential to the success of sinus surgery and increased the likelihood of favourable surgical outcomes. Early nursing instructions are crucial in order to maintain respiratory function after functional endoscopic sinus procedures. It also helps to avoid postoperative problems.

The current study's findings illustrate that two-thirds of the control group experienced severe pain after week followed by fourth of them complain of moderate/no pain. While fourth percent of the study group suffered from moderate pain in the first week followed by sixty percent of the participant hadn't pain. Generally, the proportion of study group participants who reported pain had decreased in the intensity rather than control group. The researcher supposed this change due to the effect of nursing guideline on decreasing pain intensity among the participant, beside the application of nursing instruction by the participant as mentioned during follow up. These results were in agreement with **Lourijesen et al., (2022)**, who confirmed that patient education is effective in reducing the incidence of pain both at rest and during movement and should form part of any acute pain management strategy.

The results of our investigation showed that one week postoperatively, there was headache, fever, anosmia, bleeding, and eye edema among the control group, but after two weeks, anosmia, hemorrhage, and headache were still present among them. Even though there was poor wound healing, headache, bleeding, pain, anosmia, and taste loss was

common after the first week, thankfully, all of them were on the verge of being treated after two weeks of surgery among the study group, and there was a statistically significant difference between both groups in the incidence of complications. From the researcher's point of view, this complication may arise with the inflammatory response after surgery, beside the recurrent inflammation before surgery, which may be attributed to this complication.

The findings of **Abasi et al. (2020)** were consistent with the findings of the current study, which indicated that severe bleeding and anosmia were the most frequent post-FESS complications. Fortunately, none of the patients experienced CSF leakage, retro-orbital hemorrhage, or blindness. Our results disagreed with **Khademi, Kazemi, Divanbeigi, and Afzalzadeh (2022)**, who showed that orbital injuries, meningitis, cerebrospinal fluid leaks, and irregular bleeding were the main consequences of functional endoscopic sinus surgery. Triamcinolone acetonide aqueous nasal spray and FESS together had a superior therapeutic impact on patients with CRS, according to **Hao, Gu, and Li (2022)**, who also noted minor inflammation, fewer problems, enhanced clinical symptoms, and improved olfactory function.

Additionally, Akita et al. (2020) found that the sphenopalatine foramen was the prevalent site of bleeding, and the median time to postoperative hemorrhage was the seventh day following surgery. According to the study's results, one-fourth of the study sample suffered complications such as orbital abscess, nasal adhesion, excessive crust formation, hemorrhage, infection, and oroantral fistula.

The current study's findings showed that the proportion of study group participants who reported pain had decreased in the intensity rather than control group. The researcher supposed this change reflect the effect of nursing guideline on decreasing the pain intensity among the participant, beside the application of nursing instruction by the participant as mentioned during follow up. These results were in agreement with

Lourijsen et al., (2022), who confirmed that patient education is effective in reducing the incidence of pain both at rest and during movement and should form part of any acute pain management strategy. In the control group, two-thirds of the patients experienced severe pain.

According to the results of the current study, the most common complications following sinus surgery between the control and study groups were statistically different after one week. However, after two weeks (post-assessment), the study group had improved in the most common complication after receiving postoperative nursing instructions, which could elaborate the impact of postoperative nursing instructions on improving postoperative outcomes.

Other study added that two third of the study sample had complete symptom remission, six percent had residual disease after surgery with an unsatisfactory result, and tenth of the study sample experienced a recurrence of symptoms (**Afolabi et al., 2020**). In addition to **Abasi, et al (2020)** noticed that, the most of the study sample was improved postoperative. According to the results of the current study, the most common complications following sinus surgery between the control and study groups were statistically different after one week. However, after two weeks (post-assessment), the study group had improved in the most common complication after receiving postoperative nursing instructions, which could elaborate the impact of postoperative nursing instructions on improving postoperative outcomes

In agreement with **Siu, Dong, Inthavong, Shang, and Douglas (2020)**, who came to the conclusion that using available resources and initiating inpatient nursing care early can improve postoperative outcomes after FESS. Additionally, the early postoperative instructions technique, according to **Jakobsen, Hodgall, and Seibaek (2021)**, causes patients to stay in the hospital for a shorter period of time and achieve better functional outcomes. **Jin, Sun, and Jiang (2021)**, reported that enabling patients to gain independence as soon

as possible after surgery is essential for their continuous rehabilitation and enhancing health outcomes.

Conclusion

According to the study's findings, the knowledge scores of the study group after receiving postoperative nursing instructions were greater than those of the control group, which got standard hospital care. Additionally, the study group's postoperative nursing instructions resulted in a lower score for pain and post-operative outcomes than the control group, which got standard hospital care. Consequently, the research premise was accepted.

The study recommended that:

- A big probability sample should be used for the research's replication in order to increase generality.

- Creating a post-operative rehabilitation programme that takes the patients' physical and mental needs with chronic sinusitis into account.

Constraints of the research

- Due to the study's small sample size of patients who had elective FESS, it had some limitations. Furthermore, our follow-up period was chosen at two weeks, and potential issues may have arisen beyond that time.

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