- *Basic Research*

Systematic nursing strategy for chronic rhinosinusitis patients with polyps undergoing endoscopic sinus surgery and its effect on their outcomes

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Abstract

Context: Chronic rhinosinusitis with polyps is a broad spectrum of infections and inflammatory conditions that impact both the nasal and paranasal sinus mucosa concurrently. This condition greatly influences the quality of life for patients. **Aim:** evaluate the effect of systematic nursing strategy for chronic rhinosinusitis patients with polyps undergoing endoscopic sinus surgery on their outcomes. **Methods:** the study employ a quasi-experimental (pre/posttest) research design to achieve the study aim. The study was conducted in Benha University Hospital at the ENT department and ENT outpatient clinic on a purposive sample of 105 the study used the following tolls**:** Structured patients' interviewing questionnaire**,** Visual Analogue Pain Scale**,** Sino Nasal Outcome Test 22, and Sleep Quality Scale. **Results**: Showed that that 79.1% of the participants had poor knowledge level pre systematic nursing strategy implementation. In comparison, 97.2% of them had good knowledge after one week of implementation, which declined to 91.4% at follow up after systematic nursing strategy implementation. The mean score of pain was 7.142±2.054 pre systematic nursing strategy implementation which decrease significantly to 5.647±1.726, and 2.000±1.808 post one week and follow up respectively. The SNOT 22 total mean score pre implementation was 49.704±6.111, decreased significantly to 38.428±6.723 post one weeks and 30.104±4.406 follow up post two weeks of nursing strategy implementation, which indicates better QoL ($p < 0.001$). Besides, a significant decrease in sleep quality the total mean score after one week to 30.838±7.424 and at follow up post two weeks systematic nursing strategy implementation to 25.638±5.255 compared to 69.438±6.369 pre implementation. **Conclusion:** The application of a systematic nursing strategy for individuals undergoing endoscopic sinus surgery due to chronic rhinosinusitis with polyps was successful in enhancing the outcomes and well-being of the patients. **Recommendations:** Systemic nursing strategy should be applied in all departments in hospital to improve patients' outcomes.

Keywords: Endoscopic sinus surgery, Chronic rhinosinusitis, , nasal polyps, nursing systemic intervention, outcomes.

Introduction:

The term "chronic rhino sinusitis" (CRS) denotes a cluster of conditions characterized by inflammation in the mucous membrane of the nasal passages and the paranasal sinuses. Among these is chronic rhinosinusitis with nasal polyposis (CRSwNP), a prolonged inflammatory syndrome associated with significant morbidity. This syndrome predominantly impacts individuals in their middle-aged years (with an average onset age of 42), and it is typically diagnosed in individuals ranging from 40 to 60 years old. Non-allergic diseases like cystic fibrosis can cause CRSwNP. According to estimates, 25–30% of people with chronic rhino sinusitis (CRS) also have CRSwNP. **(1)**. The aetiology of CRS is complex and uncertain, and it is intimately linked to recurrent infections, colds, and nasal congestion, as well as to dietary causes, allergic reactions, personal hygiene, hereditary variables, chronic inflammation, and other factors. With a prevalence of more than 15%, chronic sinusitis and nasal polyps have recently demonstrated a clear rising trend. Nasal congestion, olfactory abnormalities, headaches, and other mild clinical signs those are difficult for patients to recognize early on in the disease **(2)**.

The societal burden resulting from healthcare resource utilization, decreased productivity, and work absenteeism is substantial due to the widespread occurrence of chronic rhinosinusitis. This condition is also among the most frequently addressed issues in medical care settings. A subgroup of patients with treatment-resistant cases often requires endoscopic sinus surgery (ESS) as a surgical solution, even after undergoing extensive pharmacological treatments. **(3)** .

chronic respiratory illnesses are ranked by the World Health Organization's (WHO) top four global health challenges. Over 30% of the world's population is afflicted by chronic rhinosinusitis (CRS). In African nations, the incidence of CRS is on the upswing due to increased urbanization and environmental pollution. Within the realm of CRS, several unfulfilled needs exist, spanning clinical practice, research, and education. Furthermore, the significant socioeconomic strain that CRS imposes on healthcare systems is projected to surge in the coming years, underscoring the need for updated healthcare policies on both national and international scales. **(4).**

Options for treating patients with CRSwNP remain limited. The primary objective of managing chronic rhinosinusitis is to clear the airway, enhance the sense of smell, eliminate polyps, and enhance patients' quality of life. Initial treatment for chronic rhinosinusitis, with or without polyps, involves medical approaches such as antibiotics, saline irrigation, topical and systemic glucocorticoids, and leukotriene agents. Surgical intervention is reserved for

those unresponsive to medical therapy, while allergic fungal sinusitis typically requires surgery as the initial step. The established surgical procedure for chronic rhinosinusitis is functional endoscopic sinus surgery (FESS). Existing literature indicates that patients who undergo FESS experience a positive and noteworthy enhancement in their quality of life.. **(5)**.

As CRSwNP advances, it can lead to conditions like otitis media, loss of olfactory function, visual irregularities, and other ailments. Moreover, its recurrence rate is notable, significantly diminishing the quality of life for patients. Minimally invasive endoscopic sinus surgery emerges as a highly effective remedy for chronic sinusitis with nasal polyps, as it adeptly eliminates the growth, strives to retain healthy mucosa, and enhances ventilation and drainage within the nasal cavity and sinuses. Nevertheless, after the procedure, the use of nasal packing is necessary, giving rise to discomfort and negative emotions encompassing anxiety, apprehension, and a sense of deviation from the norm for the patient. These psychological strains could amplify the perception of pain and exert an influence on the overall prognosis. Thus, alleviating postoperative pain and anxiety, alongside enhancing patients' quality of life and prospects, have evolved into central objectives for postoperative care.

The concept of "systemic nursing intervention" encompasses a range of constructive nursing actions employed within the nursing process. This approach centers not only on the monitoring of vital signs, but also on offering psychological guidance, sleep management, and guidance for rehabilitative exercises. Its purpose is to enhance the efficacy of disease treatment and, in the end, to elevate the overall quality of life (QOL) [(2)]. Recently, this approach has gained widespread adoption in fields like oncology, neurology, and respiratory care, revealing its affirmative impact on promoting patients' recovery and outcomes [(7)]

Significance of the study:

Chronic rhinosinusitis stands as a persistent disorder imposes a substantial economic burden on society. It is estimated that approximately 20 million individuals are afflicted by this condition, averaging one out of every seven people in the United States. The enduring impact of chronic rhinosinusitis negatively affects patients' quality of life, hampers daily routines, and leads to notable healthcare expenditures. Given the escalating occurrence and prevalence of the disorder, it becomes imperative to scrutinize both the condition itself and

the outcomes of its treatment (8). When medical treatments prove ineffective for individuals with chronic sinusitis, endoscopic sinus surgery guided by a nasal endoscope emerges as the commonly recommended approach. A prominent method performed by rhinologists is functional endoscopic sinus surgery (ESS), with over 250,000 procedures carried out annually in the United States (9). According to the statistical records of the Ear, Nose, and Throat (ENT) department at a university hospital in Benha, Egypt (2022) (10), approximately 145 adult patients suffering from chronic rhinosinusitis and nasal polyps are admitted to this department each year for ESS.

The impact of a comprehensive nursing strategy on the outcomes of patients with chronic rhinosinusitis with nasal polyposis (CRSwNP) who undergo endoscopic sinus surgery has received limited attention in Egypt. Consequently, this study aims to assess the influence of the systemic nursing strategy on enhancing the quality of life, sleep, and pain management for patients with CRSwNP following endoscopic sinus surgery.

Operational definitions:

Patient Outcomes:

In this study patients' outcomes refers to pain, sleep quality and quality of life for patients with CRSwNP .

Aim of the study:

This study aimed to evaluate the effect of systematic nursing strategy for chronic rhinosinusitis patients with polyps undergoing endoscopic sinus surgery on their outcomes.

Research Hypotheses

H1: Patients with chronic rhinosinusitis patient with polyps will have significant knowledge score increase after systematic nursing strategy implementation compared to before implementation.

H2: The patients' mean score of pain severity will be significantly decreased after systematic nursing strategy implementation than before.

H3: Patients' quality of life score will be better post systematic nursing strategy implementation than before.

H4: Patients' quality of sleep will be better after systematic nursing strategy implementation compared to before implementation.

Subjects and Method

Research design

The study employ a quasi-experimental research (pre/post-test) design to achieve the the study aim.

Setting

This study was implemented in Benha University Hospital, Qalyoubia, Egypt at the ENT department and ENT outpatient clinic at The ENT department located in the fourth floor of surgical building contains two patients' rooms (one for females and one for males). Each room including 12 beds, and other room for preparing of medication and dressing which served patients with ENT diseases from around the governorate of Qalyoubia. It offers medical and surgical care for patients for free cost.

Sample

Type: Purposive sample of patients who diagnosed with CRSwNP admitted to aforementioned setting.

Inclusion criteria: Adult patients, from both genders, at with age range of 20 to 60 with a sufficient mental capacity to participate in the study.

The following Patients with bronchial asthma, those who have genetic disorders, and those who complain of coagulation abnormalities were excluded from the study**.**

Size: The sample size was determined utilizing the Epi info (7) statistical software, drawing from data in the prior year's admission records within the ENT department of Benha University Hospital Census (2022). This estimation was performed at a 95% confidence level, with a permissible margin of error set at 5%. Consequently, the final calculated sample size amounted to 105 participants.

Tools for data collection

The following tools were used for data collectino:

Tool I: Structured patients' interviewing questionnaire: The researcher developed this questionnaire after reviewing the related and recent literature in Arabic language **(*Farghaly & Ramadan,2022*) [(11)]and Hwang *etal., (2021)*[(12)].**It involved three sections as following:
Section I. Patient's socio demographic characteristics: This section aimed to assess of patient's age, gender, residence, qualifications, occupation, and marital status.
Section II. Medical data of the studied patients: It aimed to assess past medical history such as onset of diagnosis, chronic diseases, previous surgeries and medication. **B**. Current medical history, including information on history of smoking, allergies, and surgical reasons.

section III. This section aimed to assess the patients' knowledge about CRSwNP it contained two sub-sections:

Section 1: Patients' Knowledge about CRSwNP: it included ten MCQa such as definition (2 questions), causes (1 question), signs and symptoms (2 questions), diagnosis (2 question), treatment (1 question), complication (1 question) and prevention (1 question)

Section 2: Patients 'Knowledge about endoscopic sinus surgery: it consist of 22 true & false questions related to purpose (1 question), instruction preoperative (2 questions),bleeding after surgery (3questions), pain (2questions), nutrition(2questions),smoking (1 question) daily activity living (5 questions) and warning singes (6 questions).

Scoring system for knowledge subsection:

Correct responses were assigned a score of one, while incorrect answers were assigned a score of zero. The cumulative scores were then added up and transformed into a percentage-based score. The overall knowledge score, set at 32 degrees, equates to 100%, and it is categorized as follows:

Poor level of knowledge: Less than 50% (less than 16 degrees).

Average level knowledge: Between 50% and 75% (between 16 and 24 degrees)

Good level of knowledge: More than 75% (more than 24 degrees).

Tool II: **The Pain Visual Analogue Scale**. Adopted from Delgado et al. (2018) (13), the visual analogue pain scale encompassed a complete score spectrum spanning from 0 to 10. Larger values indicated more severe pain. This scale was categorized as follows:

- 0 was regarded as "no pain".
- It was deemed "mild pain" between 1-3.
- The range of "moderate pain" was 4-6.
- "Severe pain" was defined as between 7-9.
- 10 were deemed to be the "worst pain possible.

Tool III: Sino Nasal Outcome Test 22 (SNOT22): it was adopted and validated by **(Hopkins et al., 2009) [14]** It is a disease-specific QoL questionnaire designed specifically for CRS. This survey provides a symptom assessment using a scale of 0 to 5 across 22 criteria associated with sinonasal function. The first three domains (rhinological symptoms, extranasal rhinological symptoms, and ear/facial symptoms) address sinus-related symptoms, while the fourth and fifth domains assessing the associated psychological dysfunction and sleep dysfunction, encompass overall health-related quality of life (QoL), with higher scores indicating a more negative impact on disease-specific QoL. Scores can range from a minimum of 0 to a maximum of 110.

Tool V: Sleep Quality Scale (SQS): **Howell et al. (2008) [15] develop this scale** and used by the researcher to assess the sleep quality. It comprised 28 items. The Sleep Quality Scale (SQS) assesses sleep quality across six domains: daytime symptoms, restoration following the sleep, sleep initiation and maintenance problems, waking difficulties, and satisfaction with sleep.

Scoring Method: Using a four-point Likert scale, participants indicate the frequency of specific sleep behaviors (0 = "few," 1 = "sometimes," 2 = "often," and 3 = "almost always"). Before calculating the overall score, responses to questions related to domains 2 and 5 (restoration following the sleep and sleep satisfaction) are reversed. The total scores range from 0 to 84, where higher values indicate more pronounced sleep-related difficulties.

Systemic Nursing Strategy.

Drawing from patient needs evaluation, literature analysis, personal expertise, and expert input, the researchers formulated a comprehensive nursing strategy interventions. A booklet was crafted, employing Arabic language text alongside vivid colored illustrations.

Procedures

Administrative design and ethical consideration

After securing initial authorization from the Scientific Research and Ethics Committee of the Faculty of Nursing at Benha University (code no. RECMSNP 10), this research was carried out. Subsequently, formal endorsements were obtained from the head of the ENT departments at Benha University Hospital and the dean of the faculty of nursing. Throughout the study, meticulous attention was given to ethical considerations. All participants were informed about the study's aims, objectives, and their entitlement to discontinue participation at any point. Verbal consent was additionally obtained from the participating patients. Researchers ensured the confidentiality and anonymity of all subjects.

Preparation of the study instruments: The researchers engaged in a comprehensive analysis of relevant literature reviews and pertinent studies To formulate and select the data collection tool for this study. This encompassed a range of sources such as textbooks, evidence-based articles, online publications, and scholarly journals, aiming to enhance the theoretical comprehension of the research problem across its diverse dimensions.

Content validity and reliability:

A panel of five specialists from the medical-surgical nursing department at Benha University's Faculty of Nursing undertook the validation process for the instruments' content. Adjustments were implemented based on the panel's evaluation of the content's suitability, comprehensiveness, and sentence clarity. For evaluating reliability, Cronbach's alpha test was applied, yielding values of 0.089 for the structured interview questionnaire and 0.857 for the visual analogue scale. In terms of the SNOT-22, a study by Husain et al. in 2022 reported a Cronbach's alpha of 0.93 (16), while for the SQS, Howell et al. in 2008 reported a Cronbach's alpha of 0.81 (15).

Pilot study:

A preliminary study was conducted involving a subset of patients constituting 10% of the overall sample size, totaling 10 participants. This pilot study aimed to assess the practicality and comprehensibility of the employed instruments, as well as to gauge the time required to complete them. No alterations were made to the questionnaire following this pilot phase. Consequently, the participants in the pilot study were incorporated into the complete study sample.

Field work:

Data collection extended over a span of 6 months, starting from October 2022 and concluding in March 2023. The researchers employed the existing tools to gather data by attending the ENT department on a thrice-weekly basis (both morning and afternoon shifts), from 10:00 AM to 4:00 PM. The study comprised four distinct phasesas following:

Assessment Phase: During this stage, the researchers engaged in patient interviews, wherein they elucidated the study's objectives and requested their participation. Subsequently, each patient was individually interviewed to gather demographic information and medical history. Moreover, the researchers evaluated the patients' understanding of chronic rhinosinusitis and endoscopic sinus surgery. Additionally, assessments were conducted to gauge the severity of pain, quality of life, and sleep quality. These interviews lasted approximately 45 minutes each.

Planning Phase:

Utilizing the information acquired during the assessment phase, the researchers examined relevant literature, formulated an educational program employing a methodical nursing strategy, and produced an educational booklet. This booklet was crafted in straightforward Arabic language and featured accompanying illustrations. The researchers also established the number of sessions, their content, diverse teaching approaches, and instructional materials.

Booklet includes information about definition of CRS and nasal polyps, signs and symptoms of CRSwNP, causes, complications ,prevention , treatments ,endoscopic sinus surgery, preoperative instructions and postoperative instructions(care of surgical site, pain control, bleeding, diet , follow up and warning signs).

The study employed the following teaching methods: lecture/discussion including a simplified instruction. Media for teaching and training included: booklet, pictures, and power point presentation.

Implementation phase :

In this phase the researchers interviewed with each patient separately pre operatively(one day before surgery) and start application of systematic nursing strategy in the form of teaching sessions which includes**; first session included health teaching** in the form of information about definition of CRS and nasal polyps, signs and symptoms of CRSwNP, causes, complications ,prevention , treatments, endoscopic sinus surgery ,purpose ,benefits , preoperative instructions)This session take about 45minutes.

Second session included psychological support. Researchers start interacting with patients to learn about their emotions and level of anxiety related to surgery. As they begin to build confidence and trust, researchers start to support them. The second session continued for 15 minutes.

Third session included health practices to deal with postoperative problems as (bleeding, pain , nasal congestion ,headache and infection , sleeping problems and daily activity living practices) This session take about 30minutes.

Fourth session included postoperative diet : instructions about well- balanced diet as increase fluid intake post operatively, eat more vegetables, fruits to increase vitamin C intake, and increase food protein. The instruction also include avoidance of spicy food and high-fat and, and give up smoking and alcohol. This session takes around 15 minutes.

The fifth session was the discharge and follow up instructions: The researchers emphasized the significance of post discharge follow-up and warning signs that required physician visit.

Evaluation phase:

Evaluating the effect of implementing systemic nursing strategy for CRS patients with polyps following endoscopic sinus surgery on their outcomes. Each patient underwent two evaluations: the first after one week and the second after two weeks of the systematic nursing strategy implementation.

Statistical analysis of the data:

The Statistical Package for the Social Sciences (SPSS), version 21 (SPSS Inc., Chicago, IL), was employed to gather, categorize, digitize, organize, and analyze the collected data. Descriptive statistical methods were utilized, encompassing metrics such as mean, standard deviation, frequency, and percentages. Various statistical tests were employed, including the Paired (t) test to compare mean scores within the same sample across different study phases. Additionally, the Chi-square test was employed for numerical and percentage distributions, while the Spearman correlation test (r) was used to determine correlations between the study varaibles across various study phases. In interpreting the results, a significance level was considered highly significant when $p \leq 0.001$, significant when $p \leq 0.05$, and insignificant when $p > 0.05$.

Results

Table1: displays the socio-demographic characteristics of patients with CRS with polyps. The table shows that 49.5% of study sample aged between 40 -50 years with a mean age of 38.781 ± 5.898, (60%) of them were males as well as, 62% lives in rural areas, 68.6% of them had secondary education and 86.7% are workers also, 93.3% were married.

Table 2: displays the patients'' medical data. The table shows that 60.7% of the study sample were diagnosed with chronic rhinosinusitis with polyps since > 3 years, the majority 91.4 % of them not suffer from chronic diseases, 11.4 % had previous surgery as tonsillectomy among 66.6% of them. 54.3% of them used nasal solutions as a previous medication, concerning present history, 81% of the studied patients not smokers, 78% of them not suffering from allergy.

Figure 1 depicts that 76.1% of the examined patients indicated that pain was the primary reason for surgery, while 74.2% experienced surgery-related headaches.

Table 3: compares the patient's knowledge about CRS with polyps and endoscopic sinus surgery pre, post one week, and post two weeks of systematic nursing strategy implementation. The table shows a highly statistically significant increase in the total knowledge mean score after one and two weeks of implementing the systematic nursing strategy (P=0.000).

Figure 2: compares the patients' total knowledge level about CRS and endoscopic sinus surgery pre, after one week and at follow up. The table illustrates that 9.1% of the CRS patients had poor knowledge level before systematic nursing strategy application while , post one week 97.2% of them had good knowledge ,which declined to 91.4% of them at follow up systematic nursing strategy implementation.

Table 4: compares the pain severity before, after one week, and at follow up systematic nursing strategy application. Also, the table reveals the pain mean score of 7.142±2.054 pre systematic nursing strategy implementation which decrease to 5.647±1.726 , and 2.000±1.808 post one week and follow up respectively with a highly statistically significant differences in pain mean score before, post, and at follow up after systematic nursing strategy implementation .

Table 5: compares the studied patients' quality of life by SNOT 22 before , after one week, and follow up after systematic nursing strategy application. It shows a SNOT 22 total mean score of 49.704±6.111 before implementation, decreased significantly to 38.428±6.723 post one weeks and 30.104±4.406 follow up post two weeks nursing strategy implementation , which indicates better QoL ($p<0.001$).

Table 6: shows comparison of patients' sleep quality before, after one week, and follow up systematic nursing strategy implementation. The table also reveals a statistically significant reduction in the sleep quality total mean score one weeks after implementation to 30.838±7.424 and at follow up post two weeks systematic nursing strategy implementation to 25.638±5.255 compared to 69.438±6.369 pre implementation, which indicates better quality of sleep at p value =0.000.

Table7: demonstrates the correlation between total pain, total QOL, and total sleep quality with total knowledge about chronic rhinosinusitis among patients post one week and follow up post two weeks. The table demonstrates a negative statistically significant correlation between patients' their total pain, total QOL ,and total sleep quality with total knowledge and with P-value ≤ 0.05.

Table (1): Frequency and percentage distribution of socio -demographic characteristics the studied patients (no=105).

Variables	CRS patients	
	N	%
Age		
20-30	10	9.5
31- 40	39	37.1
41-50	52	49.5
51-60	4	3.8
X ± SD	**38.781 ± 5.898**	
Gender		
−Male	63	60
−Female	42	40
Residence		
−Rural	65	62
−Urban	40	38
qualifications		
-Read and write	4	3.8
−Preparatory	5	4.8
−Secondary	72	68.6
−University	24	22.9
Occupation		
−Not work	14	13.3
−Work	91	86.7
Marital status		
−Single	7	6.7
−Married	98	93.3

Table (2): Frequency and percentage distribution of the studied patients' medical data (no=105).

Variables	CRS patients	
	N	%
Past history		
Onset of diagnosis		
<1 years	5	4.8
1<3years	30	28.6
>3 years	70	60.7
Suffering from Chronic diseases		
Yes	9	8.6
No	96	91.4
If yes (no=9)		
-hypertension	3	33.3
Diabetes	5	55.6
Cardiac	1	11.1
Previous surgery		
Yes	12	11.4
No	93	88.6
If yes (no=12)		
Nose surgery	2	16.7
Tonsillectomy	8	66.6
Thyroidectomy	2	16.7
Previous Medication		
Nasal solution	57	54.3
Corticosteroids	39	37.1
Antibiotics	9	8.6
Present history		
Smoking		
-yes	20	19
No	85	81
Allergy		
yes	23	22
No	82	78
If yes (no=23)		
-food allergy	1	4.3
Medication allergy	8	34.8
Dust and smoke	14	60.9

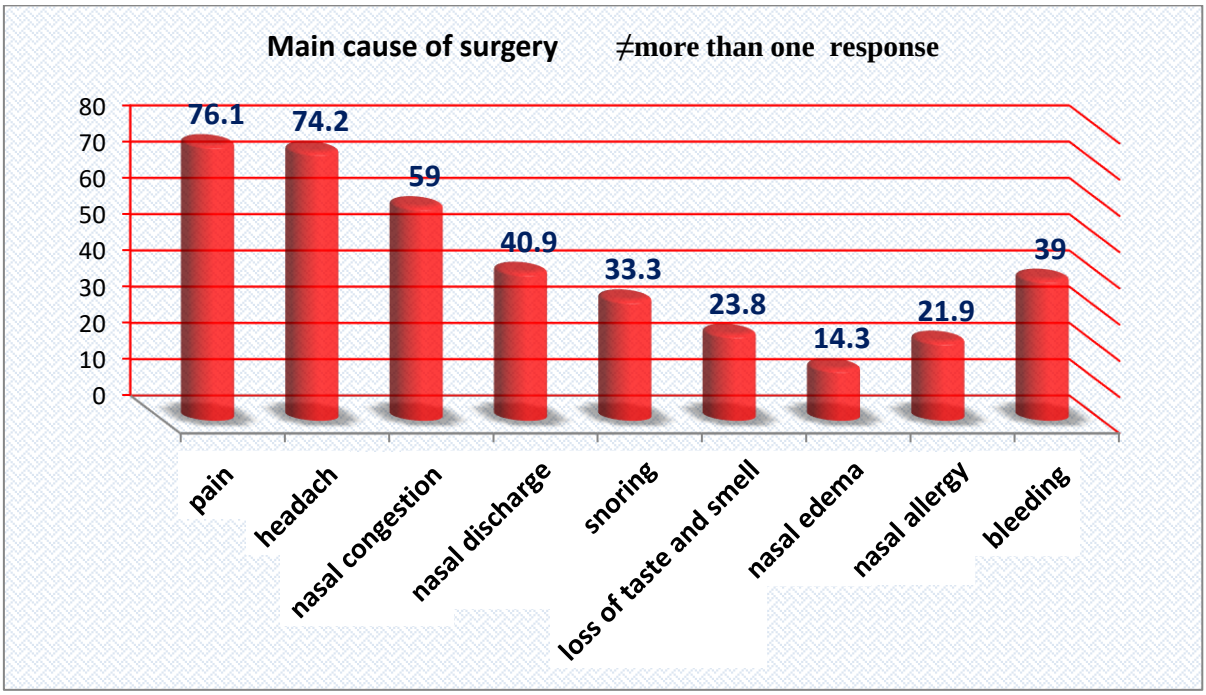
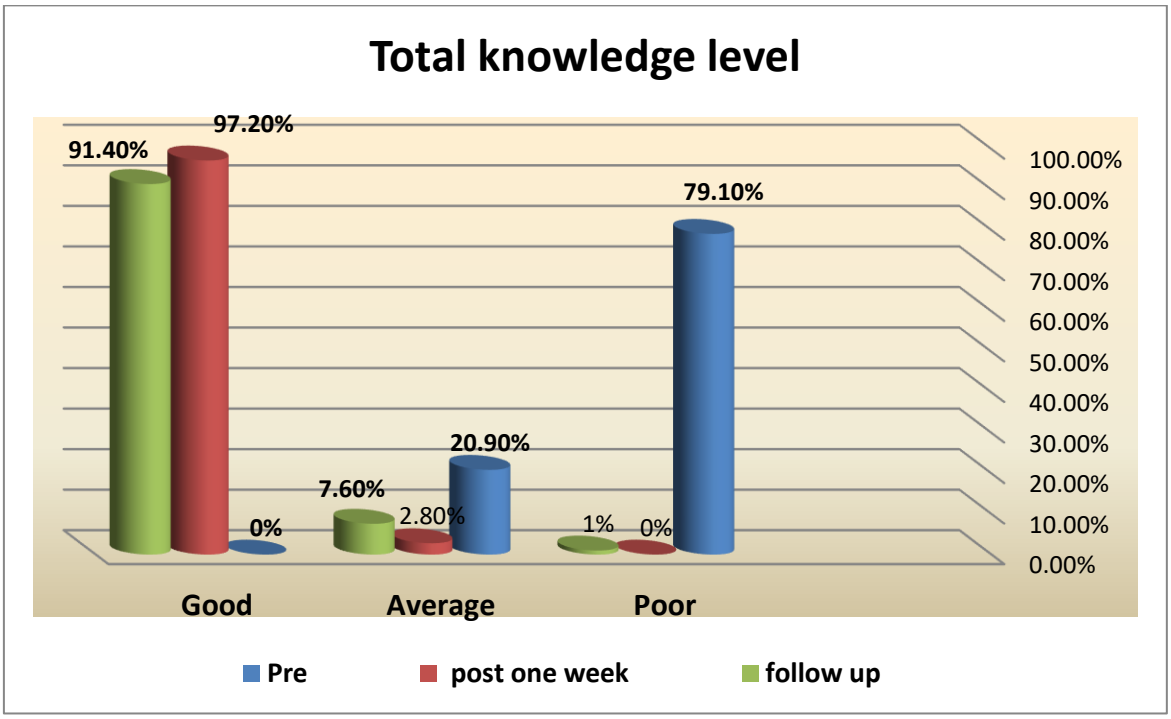


Figure (1) : Percentage distribution of the studied patients' main cause of surgery (No=105).

Table (3) : Comparison of studied patients 'knowledge score pre , post and follow up systematic nursing strategy implementation. (No=105).

Items	Pre	Post one week	Follow up (post two weeks)	T 1(P 1)	T^2 2(P 2)
	X ± SD	X ± SD	X ± SD		
General Knowledge related to chronic rhinosinusitis and polyps	3.771± 3.098	9.361 ± 1.152	8.533 ± 1.575	T: -17.327 P =0.000**	T: -14.037 P =0.000**
Knowledge related to endoscopic sinus surgery	8.200 ± 2.683	21.038 ±1.680	19.942 ± 1.890	T: -41.547 P=0.000**	T: -36.660 P=0.000**
Total knowledge	11.971 ± 4.204	30.400 ± 2.559	28.476 2.568	T-38.361 P=0.000**	T: -34.323 P=0.000**

T 1(P 1) indicates the difference between pre implementation and after one week
T 2(P 2) indicates the difference between pre and after two weeks



Figure(2) Comparison of studied patients' total knowledge level about chronic rhinosinusitis and endoscopic sinus surgery before, after one week, and at follow up systematic nursing strategy application. (No=105).

Table 4): Comparison of the studied patients' pain severity pre , post and follow up systematic nursing strategy implementation(no =105)

Pain severity	Pre		Post one week		Follow up (post two weeks		X^2_1 (p_1) value	X^2_2 (p_2) value
	No	%	No	%	No	%		
No pain	0	0	0	0	27	25.7	X^2_1=46.381 $P_1 < 0.001$	X^2_2=135.498 $p_2 < 0.001$
Mild pain	6	5.7	4	3.8	45	42.9		
Moderate pain	18	17.1	63	60	31	29.5		
Severe pain	69	65.7	38	36.2	2	1.9		
Worse pain	12	11.4	0	0	0	0		
Mean ±SD	**7.142±2.054**		**5.647±1.726**		**2.000±1.808**		**T1=5.710 P=0.000****	**T2=19.257 P=0.000****

$X^2_1(p_1)$: indicates the difference between pre implementation and after one week
$X^2_2(p_2)$: indicates the difference between pre and after two weeks

Table (5): Comparison of studied patients quality of life before, post and follow up systematic nursing strategy application (no=105).

Item	Pre	Post one week	Follow up (Post two weeks)	T 1(P 1)	T^2 2(P 2)
	X ± SD	X ± SD	X ± SD		
QoL (SNOT 22) test	49.704±6.111	38.428±**6.723**	30.104±4.406	T:12.717 P =0.000**	T:26.652 P =0.000**

Table (6) Comparison of sleep quality pre , post and follow up systematic nursing strategy application (No=105).

Item	Pre	Post one week	Follow up post two weeks	T 1(P 1)	T^2 2(P 2)
	X ± SD	X ± SD	X ± SD		
Sleep quality scale (SQS)	69.438±6.369	30.838±7.424	25.638±5.255	T:40.434 P =0.000**	T:54.350 P =0.000**

Table (7) Correlation between total knowledge of chronic rhinosinusitis, total pain ,total QOL ,and total sleep quality among patients post one week and follow up post two week. (no=105).

Items	Total knowledge			
	Post one week		Follow up post two weeks	
	R	P	R	p
Total visual analogue pain scale	**-.197**	**. 044***	**-.319**	**.001****
Total Qol(SNOT22)	**-.241**	**.013***	**-.209**	**.032***
Total Sleep quality scale (SQS	**-.274**	**.011***	**-.192**	**.049***

Discussion

The World Health Organization reported the top four health problems facing humanity, are chronic respiratory diseases. **(Albu, 2020)** [(4).] The societal impact of chronic rhinosinusitis is considerable, encompassing healthcare resource utilization, diminished productivity, and work absenteeism. This condition is prevalent and stands as one of the prevalent reasons patients seeking medical attention. A subgroup of patients with unresponsive cases often requires endoscopic sinus surgery for treatment, even after undergoing substantial pharmacological interventions **(Kwon & O'Rourke, 2021**) [(3).] The systematic nursing strategy is a scientific, organized, humanized approach to nursing. It contains several nursing interventions, including assisting patients in adhering to a doctor's prescription, maintaining nasal cavity care, raising self-care knowledge, assuring surgical efficacy, and minimizing complications. With the help of this nursing strategy, the nursing process is more tightly connected, nursing measures are further optimized, and makes clinical nursing more comprehensive and systematic. This study aimed to evaluate the systematic nursing strategy for chronic rhinosinusitis patients with polyps undergoing endoscopic sinus surgery and its effect on their outcomes.

The present study reveals the patients' socioeconomic attributes of the patients, indicating that nearly half of the sampled individuals were aged 40 years or older, with an average age of 38.781 ± 5.898. A majority of the participants were male and resided in rural regions, while approximately two-thirds of them possessed a secondary level of education. Moreover, the majority of them are workers and married. These results agreed with **Al-Abbasi et al., (2020)** [(17),] who conducted a study about " Functional endoscopic sinus surgery" documented that nearly two thirds of the studied CRS patients were males between the ages of forty and fifty.

On the same line, **Pan et al. (2023)** [(18),] studied " Effect of refined management on the recovery of patients undergoing sinusitis surgery via nasal endoscopy" Stated that the participants in their study group had an average age of (40.1±2.7), while those in the control group had an average age of (40.8±2.8). Additionally, over half of the participants were males. However, these results contrasted with those of **Afolabi et al. (2020)** (19) in their investigation titled "Indication and Outcome of Endoscopic Sinus Surgery among Patients with Chronic Rhinosinusitis with or Without Nasal Polyps in the National Ear Care Centre, Kaduna." Afolabi and colleagues reported that their study participants had a mean age of 35.9 ± 1.9 years, with a greater prevalence among young adults in their third and fourth

decades of life. Furthermore, their study noted a higher participation of women compared to men.

These results agreed with **Farghaly & Ramadan,(2022) [11]** whose study was about" Effect of Post-Operative Nursing Instruction on Patient Outcomes undergoing Endoscopic Sinus Surgery" and reported that the majority of the studied CRS patient were married.

regarding to Medical history, the present study demonstrates that more than half of the study sample were diagnosed with chronic rhinosinusitis with polyps since more than 3 years, the majority did not have any chronic diseases. Besides, half of them used nasal solutions as previous medication. These results agreed with **Qadeer et al. (2018) [8]** who studied about "Quality of Life after Functional Endoscopic Sinus Surgery in Patients with Chronic Rhinosinusitis" and reported that more than two fifth diagnosed CRSwNP. Similar to **Behiry etal (2019) [20],** who studied "Evaluation of quality of life after Functional Endoscopic Sinus Surgery (FESS) in chronic rhinosinusitis patients in Menoufia Governorate." The study showed that CRSwNP among two third s of the sample. Also in the same context, **Farghaly and Ramadan, (2022) [11]** who found that the most of their patients did not suffer from any chronic diseases. **Al Sharhan et al (2021) [21]** whose study was about "Pattern of symptom improvement following endoscopic sinus surgery for chronic rhinosinusitis" reported that most of participants not had chronic disease.

Concerning smoking history and allergy: most of the studied CRS patients were not smokers and don't have allergy. **Al Sharhan et al., (2021) [21]** supported these findings and stated that, most of the studied patients were not smokers but disagreed with him that half of participants in his study had allergy. The present study agree with **Farghaly and Ramadan, (2022) [11]** who showed that the most of their patients did not have allergy and not smokers.

Regarding main cause of ESS surgery, more than seventy fife percent of the studied sample reported thier pain as the main cause of surgery associated with headache, while more than half reported nasal congestion is the main cause, and less than half reported nasal discharge These findings agreed with .**Al Sharhan ., et al (2021) [21]** who reported that the majority of their patients verbated pain as the most common causes of surgery. This was congruent with **Farghaly& Ramadan, (2022) [11]** who found that pain, headaches, and nasal obstruction were the most prevalent preoperative symptoms among the study group. Also, **Al-Abbasi et al. (2020) [17]** recorded that the most prevalent symptoms reported by their participants included nasal congestion, nasal discharge, and headaches.

Patient knowledge is of paramount importance for several reasons such as informed decision making, adherence to treatment plan, self-management, and improved outcomes. The current research indicates that over seventy percent of the participants exhibited a poor level of knowledge prior to the implementation of the systematic nursing strategy. However, most of them demonstrated a good level of knowledge after one week and two weeks following the implementation of the same strategy. This meant education is crucial for those who have chronic illnesses like CRS since it helps them adjust to the disease's consequences and deal with its treatments. In addition, addressing the patient's educational needs may increase their motivation to learn more about their clinical situation by addressing their concerns and questions. Additionally, the implementation of systematic nursing and follow-up helps patients retain their knowledge. So, the first research hypothesis is supported by these findings.

This result agrees with **Farghaly and Ramadan, (2022) [(11)]** stated that, before the systematic nursing strategy was given, fewer than thirty percent of the participants had a satisfactory level of knowledge. However, a majority of them exhibited satisfactory knowledge after the implementation of the instructional intervention. Also, this result agreed with **Said et al. (2022) [(22)]** whose study was about "Application of Systematic Nursing Intervention on Women with Dysfunctional Uterine Bleeding" reported that application of systemic nursing improve the knowledge of participants.

Regarding pain, The current study reveals a statistically notable alteration in the overall mean pain scores before, as well as one week and two weeks subsequent to the application of a systematic nursing strategy. This result was supported by **Jin et al. (2021) [(6)]** who studied " Influence of a systematic nursing mode on the quality of life and pain of patients with chronic sinusitis and nasal polyps after endoscopic sinus surgery" reported that the postoperative pain score of the study observation group was markedly lower indicating that the systemic nursing model can effectively relieve the pain of patients and facilitate postoperative recovery. The present study aligns with **Lourijsen et al., (2022) [(23)],** who studied about " Endoscopic sinus surgery with medical therapy versus medical therapy for chronic rhinosinusitis with nasal polyps: a multicenter, randomized, controlled trial." They verified that any approach to managing acute pain should encompass patient education as a method to reduce the occurrence of pain, both when at rest and during physical activities.
The findings of **Farghaly & Ramadan, (2022) [(11)]** were consistent with the findings of the present study, This study indicated a reduction in the proportion of participants in the study group who reported pain and its intensity. The researcher hypothesized that this shift

signifies the impact of the nursing guideline in diminishing pain intensity among participants, coupled with their adherence to nursing instructions as indicated during follow-up. These results align with the second research hypothesis.

As education could influence the patient's quality of life, this study demonstrates a statistically significant difference revealed between total quality of life score before, post one week, and follow up systematic nursing strategy implementation which indicates improve QoL. This finding agreed with **Jin et al., (2021) [6] who** stated that the application of systematic nursing model improve quality of life score for stud group compared to controls.

The findings of the current study were consistent with those of **Qadeer et al. (2018)** (18), whose research revealed a statistically significant decrease in post-operative SNOT scores for the CRS with polyp group, leading to notable enhancements in patients' quality of life. Additionally, **Masterson et al. (2016)** (24) demonstrated a statistically significant enhancement in mean SNOT-22 scores during both preoperative and post-operative periods. These results aligned with the study by **Wu et al. (2019)** (25), focusing on "Improved perioperative quality of life in endoscopic sinus surgery by application of enhanced recovery after surgery," where it was reported that applying enhanced recovery after surgery led to an improved perioperative quality of life in endoscopic sinus surgery. These findings also concurred with **He & He (2022)** (26), who conducted a randomized controlled study on "Systematic nursing interventions in gastric cancer" and found that after applying the systematic nursing interventions, the scores in all aspects of quality of life within the observation group were significantly higher than those in the control group. These outcomes substantiate the third research hypothesis.

As regard to quality of sleep the current study reveals a significant decrease in the total mean score of sleep quality scale pre , post and follow up systematic nursing strategy implementation, which indicates better quality of sleep at p value =0.000). This discovery implies that education holds the essential role in efficiently handling a patient with CRS. Through mitigating its effects and offering appropriate education, behavior can be influenced, granting the patient the ability to enact positive enhancements in their health condition. The current study is aligned with **Wu et al. (2019)** (25), who demonstrated that the information furnished to patients resulted in improvements in sleep dysfunction scores. Moreover, in harmony with **Jin et al. (2021)** (6), the application of a systematic nursing model led to a decrease in sleep quality scores within the study group. These outcomes verify the fourth research hypothesis.

The correlation between total knowledge, pain. QoL, and sleep quality indicates an inverse correlation between total knowledge and both visual analogue pain scale, Qol (SNOT22) and Sleep quality scale after one week and after two weeks of implementing systemic nursing strategy . These findings indicates that the visual analogue pain scale, Qol(SNOT22), and sleep quality scale decreased as the patient's information level increased. This result agree with a study done by **Farghaly and Ramadan, (2022)** [(11)] concluded that lower scores for pain and post-operative outcomes were the result of postoperative nursing instructions. Also, **Jin, et al.,(2021)** [(6)] stated that the implementation of the systemic nursing model yielded positive outcomes for patients with CSNP undergoing endoscopic sinus surgery. This approach effectively lessened postoperative pain, enhanced patients' quality of life and sleep quality, and bolstered their satisfaction. These findings underscore an elevation in patient knowledge, leading to improvements in quality of life, sleep patterns, and pain levels. This achievement aligns with the research's intended objectives and has been substantiated.

Conclusion: Based on the findings of the current study, it can be concluded that: Implementation of systemic nursing strategy for chronic rhinosinusitis patients with polyps undergoing endoscopic sinus surgery was effective in improving patients' outcomes.

Recommendations: To improve patient outcomes, systemic nursing strategy should be applied across all hospital departments.

-Replication of the current study on a large probability sample and another geographical locations to generalize the findings.

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الملخص العربى

استراتيجية التمريض المنهجى لمرضى التهاب الجيوب الأنفية المزمن المصابين بالزوائد اللحمية الخاضعين لجراحة الجيوب الأنفية بالمنظار وتأثيرها على نتائجهم

المقدمة: يمثل التهاب الجيوب الأنفية المزمن المصاحب للأورام الحميدة مجموعة واسعة من العمليات الالتهابية التي تصيب الأنف والغشاء المخاطي للجيوب الأنفية في وقت واحد ، مما يؤثر بشكل كبير على نوعية حياة المرضى . يشير التدخل التمريضي المنهجى إلى العديد من الإجراءات التمريضية الإيجابية التي يتم تنفيذها في عملية التمريض. لا يقتصر الأمر على مراقبة العلامات الحيوية ، ولكن أيضًا الإرشاد النفسي والتثقيف الصحى وإرشادات تمارين إعادة التأهيل لتحسين فعالية علاج المرض وتحسين نوعية الحياة في نهاية المطاف.

الهدف من البحث: تقييم تأثير استراتيجية التمريض المنهجى لمرضى التهاب الجيوب الأنفية المزمن المصابين بالزوائد اللحمية الخاضعين لجراحة الجيوب الأنفية بالمنظار على نتائجهم.

. **نوع البحث:** تم استخدام تصميم شبه تجريبي

مكان البحث :أجريت هذه الدراسة في قسم الأنف والأذن والحنجرة والعيادات الخارجية في مستشفي بنها الجامعي.

العينة: عينة هادفة من المرضى الذين تم تشخيصهم بالتهاب الجيوب الأنفية المزمن مع الاورام الحميدة (عددهم 105 مرضى).

الأدوات : تم استخدام اربع أدوات لتجميع البيانات وهى استبيان المقابلة المنظم للمرضى , ومقياس الالم البصرى التناظرى , واستبيان جودة الحياه ومقياس جودة النوم .

النتائج: أوضحت أن 79.1٪ من المرضى الخاضعين للدراسة لديهم مستوى ضعيف من المعرفة قبل تنفيذ استراتيجية التمريض المنهجي ، بينما بعد أسبوع واحد كان لدى 97.2٪ منهم معرفة جيدة ، وانخفض إلى 91.4٪ منهم عند متابعة تنفيذ إستراتيجية التمريض المنهجي. كان متوسط درجة الألم 7.142 ± 2.054 قبل التنفيذ والتي انخفضت إلى 5.647 ± 1.726 ، و 2.000 ± 1.808 بعد أسبوع واحد واسبوعين على التوالي مع وجود فروق ذات دلالة إحصائية عالية. كان إجمالي متوسط الدرجات لاستبيان جودة الحياه قبل التنفيذ 49.704 ± 6.111 ، وانخفض بشكل كبير إلى 38.428 ± 6.723 بعد أسبوع واحد و 30.104 ± 4.406 بعد أسبوعين من تنفيذ استراتيجية التمريض ، مما يشير إلى جودة حياه أفضل كما وجد انخفاض كبير في إجمالي متوسط الدرجة لمقياس جودة النوم بعد أسبوع واحد إلى 30.838 ± 7.424 وعند المتابعة بعد أسبوعين من تنفيذ استراتيجية التمريض امنهجى إلى 25.638 ± 5.255 مقارنة بـ 69.438 ± 6.369 قبل التنفيذ.

الخلاصة: كان لتنفيذ استراتيجية التمريض المتهجى لمرضى التهاب الجيوب الأنفية المزمن الذين يعانون من الاورام الحميدة الخاضعة لجراحة الجيوب الأنفية بالمنظار فعالاً في تحسين نتائج المرضى.

التوصيات: يجب دمج تطبيق إستراتيجية التمريض المنهجى في جميع أقسام المستشفى لتحسين نتائج المرضى.