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Quality of Life after FESS among Patients with Nasal Polyps Using the NOSE Questionnaire Translated in Filipino (NOSE-Ph)

ABSTRACT

Objective: To evaluate the quality of life before, and after Functional Endoscopic Sinus Surgery (FESS) among patients with nasal obstruction due to nasal polyposis using the Nasal Obstruction Symptom Evaluation (NOSE) questionnaire translated in Filipino (NOSE-Ph) in a tertiary government hospital in Metro Manila.

Methods:

Design: Cross-Sectional QOL Study

Setting: Tertiary Government Hospital

Participants: Forty (40) patients with nasal polyposis who underwent FESS from April 2014 to June 2015 were included in the study. Patients who underwent FESS due to other nasal tumors other than nasal polyp were excluded. The subjects answered the previously-validated NOSE-Ph questionnaire pre- and post-operatively and the scores were gathered and analyzed.

Results: Based on the pre and post-operative scores, there was a statistically significant improvement in all 5 parameters (1. nasal congestion, 2. nasal obstruction, 3. trouble breathing, 4. trouble sleeping, and 5. inability to get enough air through the nose during exercise).

Conclusion: There was a statistically significant improvement in the quality of life of patients who underwent FESS based on the pre and post-operative scores using the NOSE-Ph questionnaire translated in Filipino.

Keywords: *nasal obstruction symptom evaluation scale*

Nasal Obstruction is a subjective complaint of discomfort manifested by a feeling of insufficient airflow through the nose.[1] This may be due to anatomic obstruction of the ostium, septal deviation, concha bullosa, paradoxic middle turbinate, nasal polyps and others.[2]

Several instruments to assess quality of life and quantify improvement or relief of nasal symptoms after nasal surgery have been formulated, but are quite lengthy.[3] The Nasal Obstruction Symptom Evaluation Scale developed by Stewart in 2004 is composed of only 5 questions that are very brief and easy to accomplish and understand.[4] The questionnaire addresses the severity of complaints that the patient has been experiencing for the past month: nasal congestion and stuffiness, nasal blockage and obstruction, trouble breathing through the nose, trouble sleeping and unable to get enough air through the nose during exercise or exertion.

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The original NOSE questionnaire in English may be difficult to administer to non-English speakers and has been previously translated and validated in Spanish,[5] Chinese,[6] Greek,[7] French,[8] and Italian.[9] This study aimed to translate and validate the NOSE questionnaire in Filipino (NOSE-Ph) and to use the NOSE-Ph to evaluate the quality of life before, and after FESS among patients with nasal obstruction due to nasal polyposis in a tertiary government hospital in Metro Manila.

METHODS

Instrument Development

The NOSE questionnaire in English (*Figure 1)* was separately translated by a professor of Filipino language from the University of the Philippines and a physician, and the results were synthesized. The synthesized version was back - translated by an English teacher. All versions were submitted to the University of the Philippines – *Sentro ng Wikang Filipino* where experts in the Filipino language[10] made the final version (NOSE-Ph): *1. Paninikip ng ilong, 2. Pagbabara ng ilong, 3. Hirap ang paghinga gamit ang ilong, 4. Hirap sa pagtulog, 5. Hindi makalanghap ng sapat na hangin gamit ang ilong tuwing nag-eehersisyo o nagbubuhat.* This questionnaire required rating of items on a 5 point scale as follows: *1 - hindi problema,* (not a problem) *2 – napakabahagyang problema,* (very mild problem) *3 – katamtamang problema,* (moderate problem) *4 – medyo masamang problema,* (fairly bad problem) and *5 –* (*malalang problema). (Figure 2)* The highest score was 20 with severe nasal obstruction and the lowest was 0 with no nasal obstruction.

Nasal Obstruction Symptom Evaluation Scale (NOSE)

Patient ID: _____ Age: _____ Date: ____/____/___ __

Over the past ONE month, how much of a problem were the following conditions for you?
Please circle the most correct response

	Not a Problem	Very Mild Problem	Moderate Problem	Fairly Bad Problem	Severe Problem
1. Nasal congestion or stuffiness	0	1	2	3	4
2. Nasal blockage or obstruction	0	1	2	3	4
3. Trouble breathing through my nose	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

Figure 1. Nasal Obstruction Symptom Evaluation Scale (NOSE). Adapted, with permission from Stewart MG, Witsell DL, Smith TL, Weaver EM, Yueh B, Hannley MT. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. Otolaryngol Head Neck Surg. 2004 Feb; 130(2): 157-163

Nose Questionnaire Filipino Translation (NOSE-Ph)

Pangalan _____ Edad: _____ Petsa: ____/____/___ __

Sa nakaraang ISANG buwan, gaano kalaking problema/sagabal ang sumusunod na kondisyon sa iyo? Pakibilugan ang pinakatamang/ pinakaangkop na sagot.

	Hindi Problema	Napakabahagya ang Problema	Katamtamang Problema	Medyo Masamang Problema	Malalang Problema
1. Paninikip ng ilong	0	1	2	3	4
2. Pagbabara ng ilong	0	1	2	3	4
3. Hirap sa paghinga gamit ang ilong	0	1	2	3	4
4. Hirap sa pagtulog	0	1	2	3	4
5. Hindi makalanghap ng sapat na hangin gamit ang ilong tuwing nag-eehersisyo o nagbubuhat	0	1	2	3	4

Figure 2. Nose Questionnaire Filipino Translation (NOSE-Ph)

The minimum number of samples for the assessment of the improvement of quality of life after FESS was computed using a 95% level of confidence and 80% power of the study. With estimated standard deviations of 11.46 and 3.86 for the pre- and post- operative nose scores respectively based on a previous study,[11] less than 10 subjects were needed.

$$n = \frac{(Z\alpha + \beta)^2 (SD_1 + SD_2)^2}{e^2}$$

Where:

n = number of subjects needed
SD1 = standard deviation pre nose score = 11.46
SD2 = standard deviation post nose score = 3.86
e = measure of effect or the difference in the pre and post nose score = 61.63 – 8.75 = 52.88
Zα = 95% confidence level = 1.96
Zβ= 80% power of the study = 1.28

The NOSE-Ph was pre-tested and validated among 10 subjects with nasal polyposis based on the computed sample size. The results revealed that the NOSE-Ph questionnaire was valid with Cronbach's alpha of 0.752 showing that it is a reliable questionnaire. Inter-item and Item-total correlations demonstrated associations. *(Table 1 and 2)* Each question contributed to the total reliability of the questionnaire since it did not increase the Cronbach's alpha when each item was deleted.

Subject Selection and Questionnaire Administration

With institutional review board approval, this cross-sectional study considered patients with nasal polyposis who underwent FESS at a tertiary government hospital from April 2014 to June 2015 for inclusion. Patients with nasal tumors other than nasal polyp were excluded. After obtaining written informed consent, a complete history and ENT examination with emphasis on nasal problems was obtained for each patient. Nasal endoscopy was performed by 2 senior ENT residents using a zero degree, 4 mm rigid nasal endoscope (CHAMMED, China) and the following rhinologic findings were recorded: grade of the nasal polyp using the Mackay classification[12] and severity of nasal disease on PNS CT using Lund - Mackay scores.[13]

Patients underwent FESS (anterior to posterior approach) with or without Caldwell luc and/or septoplasty by senior ENT residents, and were discharged after polyvinyl alcohol nasal pack (Netcell, Network Medical Products Ltd., UK) removal. They were asked to accomplish the

Table 1. Inter-Item Correlation Matrix

	Nasal congestion or stuffiness	Nasal blockage or obstruction	Trouble breathing through my nose	Trouble sleeping	Unable to get enough air through my nose during exercise or exertion
Nasal congestion or stuffiness	1.000	0.539	-0.087	0.265	0.306
Nasal blockage or obstruction	0.539	1.000	0.149	0.422	0.470
Trouble breathing through my nose	-0.87	0.149	1.000	0.113	0.126
Trouble sleeping	0.265	0.422	0.113	1.000	0.278
Unable to get enough air through my nose during exercise or exertion	0.306	0.470	0.126	0.278	1.000

Table 2. Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item Total Correlation	Squared Multiple Correlation	Chronbach's Alpha if Item Deleted
Nasal congestion or stuffiness	15.00	1.846	0.410	0.326	0.696
Nasal blockage or obstruction	14.98	1.410	0.652	0.459	0.554
Trouble breathing through my nose	14.98	2.333	0.105	0.071	0.774
Trouble sleeping	15.03	1.820	0.416	0.191	0.694
Unable to get enough air through my nose during exercise or exertion	14.93	1.866	0.461	0.236	0.675

NOSE-Ph questionnaire pre-operatively and upon follow up 1 month after surgery. They were advised to ask questions if they needed any clarification.

Outcome measure

The main outcome measure was improvement of the quality of life based on the NOSE-Ph questionnaire scores pre- and 1 month post-surgery.

Data Processing and Analysis

Data were encoded and tallied in SPSS version 10.0 for windows (IBM, Armonk, NY, USA). Descriptive statistics were generated for all variables. For nominal data frequencies and percentages were computed. For numerical data, mean ± SD were generated. Analysis of the different variables was done using the following test statistics to compare the pre-operative and post-operative NOSE-Ph scores of the patients: Paired t-test to compare two groups with numerical data that are dependent and Wilcoxon Signed ranks test, a non-parametric equivalent of the paired t-test.

RESULTS

A total of 42 patients underwent FESS in our institution during the study period. The NOSE-Ph questionnaire was administered pre- and post-operatively among the patients with nasal polyps who met the inclusion criteria. Excluded were two patients whose histopath results revealed inverting papilloma and squamous cell carcinoma, respectively. Subsequently, 40 patients were finally included, 20 males (50%) and 20 females (50%), age 10 to 77 years with a mean age of 38.85 years.

The grade of the nasal polyps were as follows: grade 1 - 0 (0%), 2 - 5 (12.5%), and 3 – 35 (87.5%). Lund - Mackay Scores were obtained individually for the right and left and combination of right and left nasal cavities based on the PNS CT scan. The total Lund - Mackay score ranged from 3-24 with a mean of 17.96± 6.63.

Surgical procedures performed were: FESS, 17 (45.94%), FESS with Caldwell luc, 20 (54.06%) and FESS with septoplasty, 3 patients (7.5%).

Before FESS, there were 29 (72.5%) subjects with severe nasal congestion or stuffiness, 10 (25.0%) with fairly bad, and 1 (2.5%) with moderate nasal congestion. After FESS, 82.5% were relieved of nasal congestion or stuffiness while 4 (10%) and 3 (7.5%) had a very mild or moderate problem respectively.

Based on the pre-operative nasal obstruction scores, 31 (77.5%) had severe nasal congestion or stuffiness, 8 (20.0%) had fairly bad, and 1 (2.5%) had very mild nasal congestion. Post-operatively, 33 (82.5%) were relieved from nasal blockage or obstruction while 7 (17.5%) had a mild problem.

With regards to trouble breathing through the nose before FESS, 31 (77.5%) had severe trouble breathing while 9 (22.5%) had fairly bad trouble breathing through the nose. After FESS, 34 (85%) had no trouble breathing through nose while 6 (15%) had very mild problem.

With regards to trouble sleeping, preoperatively, there were 26 (65%) subjects with severe trouble sleeping, while 13 (32.5%) had fairly bad trouble sleeping. Postoperatively, 34 (85%) had no trouble sleeping, and 6 (15%) had a very mild problem.

With regards to inability to get enough air through the nose during exercise or exertion, prior to FESS, 33 (82.5%) subjects were unable to get enough air through the nose during exercise or exertion, while 6 (15%) and 1 (2.5%) had a fairly bad and moderate problem, respectively. After FESS, 32 (80%) improved while 6 (15%) and 2 (5%) had moderate and a fairly bad problem, respectively.

Table 3. Comparison of the Pre and Post Nasal Obstruction Symptom Evaluation Scores of Subjects

	Pre Mean ± SD (Median)	Post Mean ± SD (Median)	*p-value**
1. Nasal congestion or stuffiness	3.70 ± 0.52 (4)	0.25 ± 0.58 (0)	<0.0001 (S)
2. Nasal blockage or obstruction	3.73 ± 0.59 (4)	0.18 ± 0.38 (0)	<0.0001 (S)
3. Trouble breathing through my nose	3.78 ± 0.42 (4)	0.15 ± 0.36 (0)	<0.0001 (S)
4. Trouble sleeping	3.62 ± 0.54 (4)	0.15 ± 0.36 (0)	<0.0001 (S)
5. Unable to get enough air through my nose during exercise or exertion	3.75 ± 0.49 (4)	0.25 ± 0.58 (0)	<0.0001 (S)

** p-values >0.05- Not significant; p-values ≤0.05-Significant*

Table 4. Wilcoxon Signed Rank Test

	N	Mean Rank	Sum of ranks
Q2TOT-Q1TOT Negative Ranks	40[a]	20.50	820.00
Positive Ranks	0[b]	0.00	0.00
Ties	0[c]		
Total	40		

a. Q2TOT < Q1TOT b. Q2TOT>Q1TOT c. Q2TOT=Q1TOT

	Q2TOT-Q1TOT
Z	-5.567[a]
Asymp. Sig. (2-tailed)	0.000

a. Based on positive ranks

Comparison between the mean preoperative 18.55 ± 1.76 and postoperative 0.95 ± 1.26 scores showed that there was a significant difference noted, with all p values <0.0001. The scores significantly decreased after nasal surgery in all 5 parameters as follows: nasal congestion or stuffiness, nasal blockage or obstruction, trouble breathing through nose, trouble sleeping and trouble getting enough air through nose during exercise or exertion. *(Table 3)*

Using the Wilcoxon signed rank test (p value < 0.000, mean: 20.5), there was a significant decrease between the pre- and post-operative NOSE-Ph scores implying relief from the 5 symptoms after FESS and subsequent improvement in the quality of life. *(Table 4)*

DISCUSSION

When administered to 40 subjects with nasal polyps who underwent FESS, there was statistically significant improvement in all 5 variables of the NOSE-Ph questionnaire and no difficulty was reported during the administration and course of the study.

The NOSE-Ph scores significantly decreased from baseline 18.55 ± 1.76 to 0.95 ± 1.26 after FESS in all 5 parameters: nasal congestion, nasal blockage, trouble breathing through nose, trouble sleeping and trouble getting enough air through nose during exercise. This implies that FESS may result in postoperative improvement of the Quality of Life of patients with nasal obstruction. That the majority of patients (87%) had grade 3 nasal polyps with mean Lund Mackay Scores of 17.96 reflecting relatively severe nasal disease associated with nasal obstruction was also noteworthy.

The NOSE questionnaire was selected because it specifically deals with nasal obstruction. It only includes a minimum of 5 variables. It is brief, simple, and direct to the point and when translated in a local language is relatively easy to understand as shown by the outcome of this study.

The NOSE-Ph demonstrated internal consistency reliability, test-retest reliability and validity which are consistent with the original English language validation by Stewart[4] as well as several previous adaptations of NOSE questionnaire in Spanish,[5] Chinese,[6] Greek,[7] French,[8] and Italian.[9]

In this study, subjects were not randomized and included patients who underwent FESS within a time period. The study focused primarily on the viability and applicability of using the NOSE-Ph questionnaire in evaluating the quality of life of actual patients who underwent nasal surgery. Normal or asymptomatic subjects with no complaints of nasal obstruction were excluded because the study aimed primarily to evaluate improvement in the quality of life after nasal surgery and did not intend to differentiate those with or without symptoms of nasal obstruction. Inclusion of normal subjects may be considered when a given test aims to identify those with and without disease which is beyond the scope of the present study.

In future studies, it is also important to consider comorbid conditions such as allergic rhinitis, asthma, COPD and others which may affect the outcome of the scores post-operatively. The NOSE-Ph questionnaire may be validated through serial monitoring of improvement of quality of life among patients suffering from nasal obstruction in the outpatient clinic, and in different centers.

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