

Correlation Between Total Nasal Symptoms Score (TNSS) and Quality of Life of Chronic Rhinosinusitis Patients in ENT Outpatient Clinic of Prof. Dr. I.G.N.G Ngoerah General Hospital Denpasar in 2021

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ABSTRACT

Introduction: Rhinosinusitis is an inflammation of the nasal mucosa and paranasal sinuses. Acute rhinosinusitis that is not treated properly can progress to chronic rhinosinusitis. Chronic rhinosinusitis can lead to impaired quality of life. Until now there is no data regarding the relationship of TNSS to the quality of life of patients with chronic rhinosinusitis based on SNOT-22, therefore researchers want to conduct research on the relationship of TNSS to the quality of life of patients with chronic rhinosinusitis based on SNOT-22.

Methods: This study was a retrospective analytical study with a cross-sectional study design.

Results: There was a significant relationship with a strong correlation ($r=0.724$) between TNSS and the quality of life of chronic rhinosinusitis patients.

Conclusion: There was a significant relationship with a strong correlation ($r=0.724$) between TNSS and the quality of life of chronic rhinosinusitis patients at Prof. Dr. I.G.N.G Ngoerah General Hospital Denpasar.

Keywords: Chronic rhinosinusitis, quality of life, symptom.

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I. INTRODUCTION

Rhinosinusitis is an inflammation of the nasal mucosa and paranasal sinuses. Acute rhinosinusitis that is not treated properly can progress to chronic rhinosinusitis. Chronic rhinosinusitis can lead to impaired quality of life due to local symptoms such as headaches, nasal congestion, olfactory disturbances, sleep disturbances, and persistent cold symptoms which can reduce patient productivity and can cause lost working days [1].

Chronic rhinosinusitis is a disease in the Ear, Nose, and Throat (ENT) that is often found in almost all countries. In the United States, it is estimated that around 31 million people per year experience rhinosinusitis. The prevalence of rhinosinusitis in the United States is approximately 15% in the adult population. According to data from the Ministry of Health of the Republic of Indonesia in 2003, nose and sinus disease is ranked 25th out of 50 major disease patterns or about 102,817 outpatients in hospitals. In Indonesia, the prevalence of chronic rhinosinusitis in 2004 was reported at 12.6% with an estimated 30 million people suffering from chronic rhinosinusitis [2].

Chronic rhinosinusitis is a multifactorial disease and has a very significant impact on quality of life and affects economic conditions. Chronic rhinosinusitis causes a lot of consumption of drugs, surgery, and hospitalization. So we

need a measuring tool to specifically assess the severity of chronic rhinosinusitis and the quality of life of patients with chronic rhinosinusitis [3].

Chronic rhinosinusitis has clinical symptoms such as nasal congestion, runny nose, and a sense of phlegm in the throat which can be accompanied by pain, especially in the affected sinus area, to olfactory disturbances that affect the patient's quality of life. These symptoms can be evaluated with several instruments, one of which is the Total Nasal Symptoms Score (TNSS) questionnaire. The questionnaire was used to evaluate 5 common symptoms, namely runny nose, nasal congestion, sneezing, itchy nose, and sleep disturbances [3].

The quality of life of rhinosinusitis patients can be evaluated using the Sino-Nasal Outcome Test-22 (SNOT-22) questionnaire. The questionnaire is one of the specific questionnaires to assess the quality of life of patients with chronic rhinosinusitis. SNOT-22 was introduced in 2003 by Dr. Jay Piccharillo. The SNOT-22 questionnaire consists of 22 questions which are divided into 4 domains, namely nasal symptoms, facial/ear symptoms, sleep disorders, and psychological changes. Until now there is no data regarding the relationship of TNSS to the quality of life of patients with chronic rhinosinusitis based on SNOT-22, therefore researchers want to conduct research on the relationship of TNSS to the quality of life of patients with chronic rhinosinusitis based on SNOT-22 [4].

II. MATERIALS AND METHODS

The design of this study is a retrospective analytical study with a cross-sectional approach. The sample included the entire population of chronic rhinosinusitis patients who came to the ENT Outpatient Clinic of Prof. Dr. I G. N. G. Ngoerah General Hospital in 2021 which was selected by consecutive sampling and met the inclusion and exclusion criteria. The data were secondary data which was the questionnaire that had been filled by the patients in 2021. We included patients who had been diagnosed with chronic rhinosinusitis, patients who had complete medical records including identity, name, age, and gender, as well as patients who are at least 15 years old. We excluded patients who refused to participate (interviewed) after proper informed consent, patients diagnosed with a malignancy in the ear, patients with head and neck malignancy, primary immunodeficiency, cystic fibrosis, psychiatric disorders, patients who had histories of surgery for chronic rhinosinusitis for the last 6 months, and patients who were uncooperative and uncommunicative. The formula used to determine the sample size in this study was the formula for determining the sample size for correlative analysis. The number of samples obtained from the formula was a minimum of 25 people.

Patients who met the inclusion and exclusion criteria were included in the study sample and data were collected from the previous questionnaire which had been filled with the patients. All data obtained were then analyzed using SPSS 24.0 software. There were 2 types of variables in this study. The independent variables were quality of life which was measured by the SNOT-22 questionnaire while the dependent variable was the severity of chronic rhinosinusitis symptoms which was measured by the TNSS questionnaire. The confounding variables were age and gender.

III. RESULTS

Based on the research, it was found that descriptive data analysis was carried out on the characteristics of the research subjects. Characteristic data was obtained in the form of a numerical data scale as described in Table I.

TABLE I: CHARACTERISTICS OF RESEARCH SUBJECTS BASED ON RESEARCH GROUPS

Variable	Frequency (n)	Percentage (%)
Gender		
Male	20	47.6
Female	22	52.4
Age (years old)		
11-20	4	9.5
21-30	7	16.7
31-40	7	16.7
41-50	12	28.5
51-60	7	16.7
>60	5	11.9
TNSS score		
Mild	15	35.7
Moderate	20	47.6
Severe	7	16.7

In this study, 20 patients, or 47.6% were male and 22 patients, or 52.4% were female. In this study, there were 12 patients, or 28.5% aged 41-50 years, 7 patients or 16.7% aged 21-30 years, 7 patients or 16.7% aged 31-40 years, and 7 patients or by 16.7% aged 51-60 years. In terms of age

characteristics, the average age of the subject was 43.2 years with the youngest subject being 15 years old and the oldest 86 years old. Based on the age category, most subjects were aged 41-50 years, namely 12 patients or 28.5%. obtained as many as 15 people (35.7%) experienced mild degrees, 20 people (47.6% experienced moderate degrees and 7 people (16.7%) experienced severe degrees.

Based on the SNOT-22 score, as seen in Table II, the highest average scores were obtained, namely nasal congestion (5.04), runny nose (3.86), sneezing (3.59), need to blow nose (3.04), production of nasal discharge (2.27) and waking at night (2.00). The total value of the average score of SNOT-22 is 44.84.

TABLE II: SNOT -22 SCORE OF CHRONIC RHINOSINUSITIS PATIENTS

SNOT-22 ITEM	Mean score
Need to blow nose	3.04
Nasal blockage	5.04
Sneezing	3.59
Runny nose	3.86
Coughing	1.90
Post-nasal drip	2.27
Thick nasal discharge	1.81
Ear fullness	1.90
Dizziness	1.63
Ear pain	0.59
Facial pain/pressure	1.63
Decreased sense of taste/smell	0.72
Difficulty falling asleep	1.95
Wake up at night	2.00
Lack of good night's sleep	1.95

Based on the normality test using the *Kolmogorov-Smirnov* test, it was found that the variable degree of chronic rhinosinusitis assessed by TNSS, the data was not normally distributed with a sig value of 0.001 ($p < 0.05$). In the quality of life variable assessed by SNOT-22, the data was not normally distributed with a sig value of 0.009 ($p < 0.05$).

Furthermore, statistical tests were conducted to determine the correlation between the degree of chronic rhinosinusitis and the patient's quality of life. Because both variables have data that are not normally distributed, the *Spearman Correlation Test* was chosen as the next statistical test.

TABLE III: THE SPEARMAN CORRELATION TEST RESULT

Spearman's rho	TNSS	SNOT-22
TNSS Correlation Coefficient	1.000	0.724**
Sig. (2-tailed)	0.000	0.000
N	42	42
SNOT-22 Correlation Coefficient	0.724**	1.000
Sig. (2-tailed)	0.000	0.000
N	42	42

** . Correlation is significant at the 0.01 level (2-tailed)

After the Spearman correlation test, the sig value was 0.00 ($p < 0.05$), which means that there was a significant relationship with a strong correlation ($r = 0.724$) between TNSS and the quality of life of chronic rhinosinusitis patients at the ENT outpatient clinic, Prof. Dr. I G. N. G. Ngoerah General Hospital Denpasar in 2021.

IV. DISCUSSION

This research is a retrospective analytic study using a cross-sectional design. This study aims to determine the relationship between TNSS and the quality of life of patients

with chronic rhinosinusitis at the ENT outpatient clinic, Prof. Dr. I G. N. G. Ngoerah General Hospital Denpasar in 2021. The subjects of this study were chronic rhinosinusitis patients at the ENT outpatient clinic, RSUP Prof. Dr. I G. N. G. Ngoerah General Hospital Denpasar in 2021. Then an assessment of the degree of chronic rhinosinusitis symptoms was carried out using the Total Nasal Symptom Score (TNSS) and quality of life using the Sino Nasal Outcome Test-22 (SNOT-22).

Some symptoms of chronic rhinosinusitis can be evaluated using certain instruments such as questionnaires. One of the instruments used is the Total Nasal Symptom Score (TNSS), which contains 5 symptoms that often arise, namely runny nose, nasal congestion, sneezing, itchy nose, and sleep disturbances. Then the assessment is carried out with a score of 0, 1, 2, and 3, where 0 if you don't experience these symptoms, 1 if you feel mild symptoms but they don't feel disturbing, 2 if you feel symptoms can still be tolerated, 3 if you feel severe symptoms to even experience disturbances in activity. sleep disorders. In chronic rhinosinusitis, TNSS is part of routine clinical practice to classify the disease as mild, moderate, and severe. In research, TNSS and individual symptoms are often combined into studies as instruments for estimating symptom severity and disease burden [5], [6].

The Sino Nasal Outcome Test-22 (SNOT-22) is an instrument that can be used to assess the quality of life of patients with chronic rhinosinusitis. SNOT-22 consists of four domains, namely nasal symptoms, facial/ear symptoms, sleep disturbances, and psychological changes that can facilitate the assessment of these 4 parts. SNOT-22 was introduced in 2003 and made by Dr. Jay Pic Featurelo which is a modification of SNOT-20 with the addition of 2 questions, namely nasal obstruction and changes in smell/taste. Both of these symptoms are part of the diagnostic criteria for chronic rhinosinusitis. Currently, SNOT-22 is the best specific questionnaire to assess the quality of life of patients with chronic rhinosinusitis and has been validated [7].

According to [6], several instruments can be used to assess the quality of life of patients with chronic rhinosinusitis, including SF-36, RSOM-31, SNOT-20, and SNOT-22. SNOT-22 is an instrument that has a higher psychometric quality and has been used significantly in various studies as an instrument of quality of life assessment in patients with chronic rhinosinusitis and to provide comparative data. The currently recommended instruments based on the literature are RSOM-31 and SNOT-22. According to [4], SNOT-22 is a valid and easy-to-apply instrument in assessing the quality of life of patients with chronic rhinosinusitis and can also be used to assess the outcome of surgical intervention [4], [8].

In this study, a total of 42 samples were obtained with the majority of the research subjects being female as many as 22 patients or 52.4%. According to [6] the prevalence of chronic rhinosinusitis without nasal polyps was higher in women than men with a ratio of 6: 4. According to [10], the prevalence range of chronic rhinosinusitis was 3.4% in men and 5.7% in women. The results of this study are slightly different from the research conducted by [7], which reported that from 104 rhinosinusitis patients who underwent surgical therapy, the majority of research subjects were 58% male. In various literatures, there is no mention of a relationship between

gender and the incidence of chronic rhinosinusitis [7], [9], [10].

Based on age, the majority of subjects at age of 41-50 years were 12 patients or 28.5%. In terms of age characteristics, the average age of the subject was 43.2 years with the youngest subject being 15 years old and the oldest 86 years old. According to a study conducted by [2], the mean age of the research subjects was 40.7 years. In a study conducted by [11] found that the mean age of the study subjects was 48 years. According to [4] this prevalence increases with age, with an average of 2.7% and 6.6% in the age groups of 20-29 and 50-59 years [2], [8], [11].

Based on the average value of each question point in the SNOT - 22 questionnaire, the 6 highest scores were obtained, namely nasal congestion (5.04), runny nose (3.86), sneezing (3.59), needing to exhale (3, 04), the production of back nasal fluid (2.27) and waking at night (2.00). This shows that the highest 5 points are part of nasal symptoms and the next 1 point is a sleep disorder that occurs due to a disturbance in the nose. According to [12] in the rhinosinusitis group without nasal polyps, nasal congestion was the symptom with the highest mean score, followed by a reduced sense of smell/taste and tired awakening. Meanwhile, in a study conducted by [11] the highest scores from the SNOT-22 questionnaire were nasal congestion, needing to blow your nose, reduced sense of smell/taste, waking up tired and tired throughout the day [11], [12].

In this study, the average total score of SNOT-22 was 44.84. A higher total SNOT-22 score indicates that there is a disorder that affects the quality of life of the research subjects. According to [11], the SNOT-22 score range is 0-110 where a lower score indicates a better quality of life. The minimum difference that is considered significant in this questionnaire is 8.9 points, so if there is a change in the score of fewer than 9 points, it cannot be considered a real improvement in quality of life.

The disorders assessed in the SNOT-22 questionnaire indicate the magnitude of the effect of rhinosinusitis on the patient's quality of life. According to [6], chronic rhinosinusitis not only harms several aspects of quality of life but also has an impact on the patient's socioeconomic status. Total spending due to SSR in the United States was \$2609 per year and in Europe up to \$1861 per year. Adult chronic rhinosinusitis sufferers, 85% of whom are of working age (18-65 years) will also cause a decrease in working days and productivity at work which will ultimately affect the economic condition of the sufferer. Reference [2] stated the same thing, that compared to patients without rhinosinusitis, rhinosinusitis patients needed more days to rest and also had to seek professional medical help. Quality of life assessment needs to be done to assess the severity of the disease and assess clinical efficiency and quality of patient care [2], [8], [10].

To date, SNOT-22 is used in different research fields and in clinical practice to determine disease burden, outcomes of medical or surgical interventions, and for preoperative evaluation of candidates. However, nowadays a large number of chronic rhinosinusitis patients can be found especially visiting the doctor for treatment so it is very important to use a simple and reliable instrument that can be used by all health care providers and patients are no exception for self-

assessment. One of these instruments is the TNSS [5]. Based on the TNSS, it is known that the degree of rhinosinusitis symptoms experienced by the patients, as many as 15 people (35.7%) experienced a mild degree, 20 people (47.6%) experienced a moderate degree and 7 people (16, 7%) had a severe degree. The presence of disturbances that occur in the nose, face, or ears can cause sleep disturbances and, in the end, will have a psychological impact on daily activities and the quality of life of patients [9]. The results of research by [5] found a significant relationship between SNOT-22 and VAS-TNSS ($p < 0.001$) in patients with chronic rhinosinusitis, with a strong correlation level ($r = 0.655$).

This study was also conducted to determine the relationship between TNSS and the quality of life of patients with chronic rhinosinusitis. After the Spearman correlation test, the sig value was 0.00 ($p < 0.05$), which means that there is a significant relationship with a strong correlation ($r = 0.724$) between TNSS and the quality of life of chronic rhinosinusitis patients at the ENT outpatient clinic, Prof. Dr. I G. N. G. Ngoerah General Hospital Denpasar in 2021.

V. CONCLUSION

In this study, a total of 42 samples were obtained with the majority of the research subjects being female as much as 52.4%. Most of the subjects aged 25-44 years and 45-64 years old were 15 subjects (35.7%). This study showed a significant relationship with a strong correlation ($r = 0.724$) between TNSS and the quality of life of chronic rhinosinusitis patients at the ENT outpatient clinic, RSUP Prof. Dr. I G. N. G. Ngoerah General Hospital Denpasar in 2021.

Further research on the assessment of the degree of symptoms and quality of life in patients with chronic rhinosinusitis needs to be done to help assess the effect of chronic rhinosinusitis on quality of life, and health status and can be used to measure the success rate of therapy.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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