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Sino-Nasal Outcome Test-22 (SNOT-22) Scores as an Indicator of Quality of Life in Patients with Chronic Rhinosinusitis at Bayu Asih General Hospital, Purwakarta

Azmi Agnia*, Erick Maulana Yusup
RSUD Bayu Asih Purwakarta, Indonesia
Email: azmizein@ymail.com*, ebasmaulana@gmail.com

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Abstract

Chronic rhinosinusitis (CRS) can substantially impair health-related quality of life through persistent sinonasal symptoms and their effects on daily activities and functioning. However, evidence regarding patient-reported symptom burden and quality of life in regional hospitals in Indonesia remains limited. This study aimed to describe the quality of life of patients with CRS at Bayu Asih General Hospital in Purwakarta, Indonesia, using the 22-item Sino-Nasal Outcome Test (SNOT-22). A descriptive observational study with a cross-sectional design was conducted among 34 patients recruited through consecutive sampling. Data were collected using a validated Indonesian-language version of the SNOT-22 and analyzed descriptively according to participants' age and sex characteristics. Most participants were female (64.7%), and 50.0% were aged 18–39 years. The mean age was 40.79 ± 15.28 years. The mean SNOT-22 score was 48.59 ± 19.17, with a median of 47 and scores ranging from 18 to 100. Based on the study's predefined operational classification, 52.9% of participants were categorized as having moderate symptom burden, 41.2% as having severe symptom burden, and 5.9% as having mild symptom burden. These findings indicated a substantial patient-reported symptom burden and associated impairment in health-related quality of life. However, the severity categories reflected study-specific operational thresholds rather than universally established SNOT-22 cutoff values. The findings highlighted the potential value of incorporating standardized patient-reported outcome measures into routine clinical assessments to support comprehensive CRS management. Further longitudinal studies involving larger samples and incorporating clinical characteristics, comorbidities, and treatment-related outcomes are warranted to identify factors associated with symptom burden and evaluate changes in health-related quality of life following treatment.

INTRODUCTION

Chronic rhinosinusitis (CRS) is a chronic inflammatory condition of the nasal and paranasal sinus mucosa that persists for at least 12 weeks (Nappi et al., 2025; Sedaghat et al., 2022). It is characterized by two or more symptoms, at least one of which must be nasal obstruction or congestion, or anterior or posterior nasal discharge, with or without facial pain or pressure and a reduction or loss of the sense of smell (Fokkens et al., 2020). CRS is frequently encountered in otorhinolaryngology–head and neck surgery (ORL-HNS) clinical practice and can substantially affect patients' health and quality of life (Fokkens et al., 2020; Hastan et al., 2011).

The prevalence of CRS has been estimated at approximately 5%–12% among adults (Hastan et al., 2011; Sedaghat et al., 2022). This condition is a common reason for seeking otorhinolaryngological care and contributes substantially to the burden on health care services. Furthermore, CRS is associated with a considerable disease burden because persistent symptoms can interfere with daily activities, physical functioning, and overall well-being (Rosenfeld et al., 2015).

Beyond its physical manifestations, CRS can substantially impair patients' health-related quality of life. Persistent symptoms, including nasal congestion, sleep disturbances, facial pain, and olfactory dysfunction, may contribute to reduced work productivity, psychological distress, and limitations in social activities (Rosenfeld et al., 2015; Rudmik & Smith, 2011). Consequently, assessing quality of life is an important component of evaluating disease burden and treatment outcomes in patients with CRS.

The burden of CRS extends beyond localized symptoms involving the nose and paranasal sinuses and can affect multiple aspects of daily life. Chronic nasal obstruction, nasal discharge, olfactory dysfunction, and facial pain or pressure may contribute to sleep disturbances, fatigue, impaired concentration, reduced participation in daily activities, and decreased productivity. Therefore, a comprehensive assessment of CRS should not rely exclusively on anatomical findings or indicators of inflammation but should also consider the patient's subjective experience and the effects of symptoms on health-related quality of life (Fokkens et al., 2020; Hopkins et al., 2022).

Health-related quality of life (HRQoL) is an essential consideration in CRS assessment because the severity of patient-reported symptoms does not always correspond directly to objective measures of disease. Nasal endoscopy and computed tomography (CT) provide information about sinonasal anatomy and inflammatory changes, whereas patient-reported outcome measures capture patients' perceptions of symptom severity and the effects of disease on daily functioning. These approaches are therefore complementary and contribute to a more comprehensive clinical evaluation of CRS (Hopkins et al., 2022; Yim et al., 2021).

One of the most widely used disease-specific instruments for assessing HRQoL in patients with CRS is the 22-item Sino-Nasal Outcome Test (SNOT-22). The SNOT-22 is a validated patient-reported outcome measure consisting of 22 items designed to evaluate sinonasal symptoms and their effects on daily functioning and well-being. Each item is scored from 0 to 5, yielding a total score ranging from 0 to 110. Higher total scores indicate a greater symptom burden and more substantial impairment in disease-specific HRQoL (Khan et al., 2022; Riedl et al., 2021).

The validity and reliability of the SNOT-22 have been evaluated across different populations and languages. Riedl et al. demonstrated that the German-language version of the SNOT-22 had favorable psychometric properties and could be used to assess sinonasal symptoms, HRQoL, and responses to treatment in patients with CRS. These findings supported the cross-cultural applicability of the SNOT-22 when appropriate translation, cultural adaptation, and psychometric validation procedures were undertaken (Riedl et al., 2021).

In Indonesia, the SNOT-22 has undergone translation, cultural adaptation, and validation. Juanda et al. evaluated the Indonesian-language version of the SNOT-22 among 50 patients with CRS attending the Allergy and Rhinology Clinic of the Department of

Otorhinolaryngology–Head and Neck Surgery, Faculty of Medicine, Universitas Padjadjaran/Dr. Hasan Sadikin General Hospital, Bandung. The study reported a Cronbach's alpha coefficient of 0.936 and favorable validity findings, indicating high internal consistency and supporting the use of the Indonesian-language SNOT-22 to assess disease-specific HRQoL in patients with CRS (Juanda et al., 2017).

SNOT-22 scores should be interpreted cautiously because the instrument produces a continuous total score and does not have universally accepted cutoff values for categorizing symptom burden or HRQoL impairment as mild, moderate, or severe. A normative study involving 1,000 healthy individuals reported a mean SNOT-22 score of 20.2 ± 19.44. The study also identified variations in scores according to age and sex, suggesting that demographic characteristics should be considered when interpreting SNOT-22 results (Plath et al., 2023).

Demographic characteristics may also influence the perception and reporting of symptoms and HRQoL among patients with CRS. A prospective study involving 520 patients with CRS identified sex-related differences in SNOT-22 scores, with women reporting higher overall scores and greater symptom burden in the ear/facial, psychological, and sleep-related domains than men. Other multicenter studies have similarly indicated that women may report greater HRQoL impairment at initial presentation, even when objective indicators of disease severity do not consistently demonstrate more extensive disease (Asokan et al., 2023; Ramos et al., 2022).

Sleep-related and psychological symptoms are also important contributors to impaired HRQoL in patients with CRS. A 2024 study involving 276 patients with CRS reported that sleep disturbances, psychological symptoms, fatigue, olfactory dysfunction, impaired concentration, and reduced productivity were important components of the patient-reported disease burden. SNOT-22 scores also differed according to the level of clinical disease control, highlighting the relationship between symptom control and patients' perceived health status (Wu & Zhan, 2024).

Although the SNOT-22 has been extensively investigated, much of the available evidence has been derived from populations and health care settings that may differ from those of regional hospitals in Indonesia. Evidence describing SNOT-22 score distributions among patients with CRS receiving care at regional hospitals, particularly Bayu Asih General Hospital in Purwakarta, remains limited. This local evidence gap highlights the importance of characterizing patient-reported symptom burden and disease-specific HRQoL using the validated Indonesian-language version of the SNOT-22. Such information may provide a foundation for improving patient-centered assessment and identifying areas requiring greater clinical attention.

Accordingly, this study aimed to describe SNOT-22 scores as indicators of disease-specific HRQoL among patients with CRS at Bayu Asih General Hospital in Purwakarta, Indonesia. Specifically, the study sought to characterize participants according to age and sex and describe the distribution of SNOT-22 total scores. By providing hospital-specific descriptive evidence, the findings were expected to contribute to a better understanding of patient-reported symptom burden in this clinical population and support the integration of standardized HRQoL assessments into routine CRS care.

METHOD

Research Design

This study employed a descriptive observational approach with a cross-sectional design to assess health-related quality of life among patients with chronic rhinosinusitis (CRS) using the 22-item Sino-Nasal Outcome Test (SNOT-22). Participant characteristics, including age and sex, were also recorded and analyzed descriptively.

Participant characteristics and SNOT-22 scores were assessed during a single observation period without any study-administered intervention. The study was conducted among patients with CRS receiving care at Bayu Asih General Hospital in Purwakarta, Indonesia, to describe their symptom burden and associated impairment in health-related quality of life.

Population and Research Sample

Research Sample

The sample size is calculated using the average estimation formula. The standard deviation value of the SNOT-22 score was taken from several previous studies that reported a standard deviation of about 20 in patients with chronic rhinosinusitis. With a confidence level of 95% (Z = 1.96) and a precision of 5, a minimum sample of 62 respondents was obtained. Considering the possibility of sample loss of 10%, the minimum number of samples required in this study is 68 respondents.

Based on the data collection process, 34 respondents were obtained who met the research criteria and had data that could be analyzed.

The number of respondents obtained was lower than the minimum number of samples planned in the early stages of the study. Therefore, the results of this study are interpreted as a descriptive picture of the study population and are not intended to make broad generalizations to the entire population of chronic rhinosinusitis patients.

Sampling Techniques

The sampling technique in this study uses the consecutive sampling method. Consecutive sampling is a non-probability sampling technique in which all subjects who meet the inclusion criteria and are not included in the exclusion criteria are included as research samples sequentially until the required number of samples is met.

In this study, all patients diagnosed with chronic rhinosinusitis and came for treatment at the ENT Polytechnic of Bayu Asih Purwakarta Hospital during the study period will be selected based on inclusion and exclusion criteria. Patients who met these criteria were then asked to be willing to become research respondents and were asked to fill out the Sino-Nasal Outcome Test-22 (SNOT-22) questionnaire.

RESULTS AND DISCUSSION

Characteristics of Respondents

This study was conducted on chronic rhinosinusitis patients who were treated at the ENT Poly of Bayu Asih Purwakarta Hospital during the research period. The number of respondents who met the inclusion and exclusion criteria and were willing to participate in the study was 34 people.

Table 1 Distribution of Respondents by Gender

Gender	**n**	%
Male	12	35,5
Women	22	64.7
Total	**34**	**100**

Based on Table 1, most of the respondents were female as many as 22 people (64.7%), while male respondents were 12 people (35.3%).

Table 2 Distribution of Respondents by Age Group

Age Group	**n**	**%**
18-39 years old	17	50,0
40-59 years old	13	38,2
≥ 60 years old	4	11, 8
Total	**34**	**100**

Based on Table 2, most of the respondents were in the age group of 18–39 years old as many as 17 people (50.0%). The age group of 40-59 years amounted to 13 people (38.2%), while the age group of ≥60 years was 4 people (11.8%).

Table 3 Age Distribution of Respondents

Variabel	**Value**
Mean ± SD	40.79 ± 15.28 years
Minimum	19 years old
Maximum	69 years old

Based on Table 3, the average age of respondents was 40.79 ± 15.28 years with the youngest age being 19 years old and the oldest age being 69 years.

SNOT-22 Score Overview

Table 4 Distribution of SNOT-22 Total Scores

Variabel	**Value**
Mean ± SD	48,59 ± 19,17
Median	47
Minimum	18

Maximum	100

Based on Table 4, the average total SNOT-22 score in chronic rhinosinusitis patients was 48.59 ± 19.17 with a median of 47. The lowest score obtained is 18 and the highest score is 100.

Table 5 Distribution of SNOT-22 Score Categories

Category	**n**	**%**
Lightweight	2	5,9
Medium	18	52,9
Weight	14	41,2
Total	34	100

Based on Table 4.5, most of the respondents were in the medium category as many as 18 respondents (52.9%), followed by the heavy category as many as 14 respondents (41.2%), and the light category as many as 2 respondents (5.9%).

Summary of Research Results

This study involved 34 chronic rhinosinusitis patients who were treated at Bayu Asih Purwakarta Hospital. Most of the respondents were female (64.7%). Based on age group, the majority of respondents were in the age group of 18-39 years as many as 17 people (50.0%), followed by the age group of 40-59 years as many as 13 people (38.2%), and the age group ≥60 years old as many as 4 people (11.8%). The average age of respondents was 40.79 ± 15.28 years.

The average total SNOT-22 score obtained was 48.59 ± 19.17 with a median of 47. Most patients were in the moderate quality of life category (52.9%), while 41.2% of patients were in the severe quality of life category. Overall, 94.1% of respondents had a SNOT-22 score in the moderate to severe category, which indicates that chronic rhinosinusitis has a meaningful impact on the quality of life of patients at Bayu Asih Purwakarta Hospital.

Characteristics of Respondents by Gender

This study involved 34 chronic rhinosinusitis (RSK) patients, consisting of 12 males (35.3%) and 22 females (64.7%). Thus, women are the group with the largest proportion in this study.

The higher proportion of women in this study is in accordance with several RSK studies which show differences in characteristics based on sex. In a cohort of RSK patients who underwent evaluation for surgery, women accounted for 50.9% of all subjects. The study also found differences in SNOT-22 scores by gender, with women having higher overall scores and certain elements than men. The findings suggest that gender may be one of the characteristics related to the perception of disease burden in RSK patients (Albu et al., 2022).

Adams et al.'s study involving 1,268 RSK patients undergoing FESS also showed that women reported a higher burden of symptoms before surgery. The average SNOT-22 score

before surgery was 51.1 ± 20.9 in females compared to 44.7 ± 20.0 in males. These differences remained visible at some point after surgery even though the overall improvement in patients was relatively similar between the sexes (Adams et al., 2023).

The findings suggest that the difference in the number of women in the study is not only related to disease prevalence, but may also be related to differences in symptom perception, symptom reporting, and psychosocial impact of the disease. Research on sex differences in RSK shows that women may report a higher quality of life burden even though certain objective disease measures are not always more severe (Adams et al., 2023; Ramos et al., 2022).

However, the results of this study cannot be used to state that women have a worse quality of life than men. This study only uses univariate analysis so that no statistical test was carried out to determine the relationship or difference in SNOT-22 scores based on gender. Therefore, the results that can be concluded are that **women are the group with the largest proportion in this study sample**.

Characteristics of Respondents by Age

Based on age group, as many as 17 respondents (50.0%) were in the age group of 18–39 years, 13 respondents (38.2%) were in the age group of 40–59 years, and 4 respondents (11.8%) were aged ≥60 years. The average age of the respondents was 40.79 ± 15.28 years with an age range of 19–69 years.

The dominance of the 18–39 age group shows that most of the respondents in this study are in the young and productive adult age group. RSK is a chronic disease that can impact various aspects of life, including daily functioning, sleep, concentration, productivity, and the patient's psychological condition. Research on RSK patients shows that sleep disorders and psychological aspects are important components that contribute to a decrease in quality of life (Wu & Zhan, 2024).

The results of this study are in line with the research *of Gupta et al*. on RSK patients undergoing *functional endoscopic sinus surgery* (FESS), which showed that the patients consisted of an adult age group with a wide range of age variations. The study also used SNOT-22 to assess quality of life and show an improvement in quality of life after intervention (Gupta, 2024).

Keshari et al.'s 2024 research on 70 RSK patients got an average age of around 40 years, which is relatively close to the average age of this study, which is 40.79 years. These similarities show that the adult population with RSK in this study has a comparable age distribution to some previous clinical studies. However, differences in hospital characteristics, inclusion criteria, and patient referral patterns may cause variations in age distribution between studies (Keshari et al., 2024).

Age also needs to be considered in the interpretation of quality of life as perceptions of symptoms can change throughout life. SNOT-22 normative data on 1,000 healthy individuals showed that individuals aged ≤50 years had a higher average score than individuals aged >50 years. However, the data are from healthy populations and therefore cannot be used to state that certain ages cause higher SNOT-22 scores in RSK patients (Plath et al., 2023).

Thus, the dominance of the 18–39 year age group in this study is more accurately interpreted **as a description of the demographic characteristics of the respondents, not** as evidence that young adults have a higher risk of RSK or have a worse quality of life than other

age groups. Because this study used univariate analysis, the relationship between age and SNOT-22 scores could not be determined.

Overview of SNOT-22 Scores in Chronic Rhinosinusitis Patients

The results showed that the average total score of SNOT-22 was **48.59 ± 19.17**, with a median of 47 and a score range of 18–100. These results show that there is a considerable burden of symptoms and quality of life disorders in RSK patients who are study respondents.

Another study used *item response theory* analysis in RSK patients and showed that SNOT-22 is an instrument with good psychometric characteristics in measuring disease burden. The nasal, sleep, and emotional domains provide considerable information on the severity of the patient's feelings. The findings support the use of SNOT-22 as an instrument to describe the quality of life of RSK patients in a multidimensional manner (Hopkins et al., 2009).

The average score of 48.59 in this study shows that patients who are respondents have a considerable burden of symptoms. A high SNOT-22 score can reflect a combination of synoasal symptoms and their impact on sleep, daily functioning, and emotional state. Recent research shows that RSK patients with sleep and psychological disorders have a poorer quality of life, with SNOT-22 being one of the instruments that can describe these impacts (Wu & Zhan, 2024).

The results of this study are also relatively similar to the study of Keshari et al. which obtained an average initial SNOT-22 score of **49.01 ± 14.83** in 70 RSK patients before FESS. The average is very close to the average of this study, which is 48.59 ± 19.17. This similarity suggests that a SNOT-22 score of around 49 can be found in a population of RSK patients who have a fairly significant symptom load (Keshari et al., 2024).

In Khan et al.'s research, it was shown that SNOT-22 has five domains, namely *nasal*, *ear/facial*, *sleep*, *function*, and *emotion*. Thus, a high total score does not solely reflect nasal complaints, but may reflect the impact of RSK on the patient's sleep, daily functioning, and emotional state (Khan et al., 2022).

Wu and Zhan's 2024 research supports the importance of this non-nasal aspect. In 276 RSK patients, smell disorders, fatigue, poor sleep, decreased concentration, and productivity were some of the most annoying complaints. SNOT-22 scores differ meaningfully based on the level of clinical control of the disease (Wu & Zhan, 2024).

Therefore, the average score **of 48.59** in this study can illustrate that RSK has a considerable impact on the quality of life of respondents, not only through synoasal symptoms but also possibly through sleep, function, and emotional aspects.

SNOT-22 Score Distribution

Based on the operational categorization used in this study, as many as 2 respondents (5.9%) were in the light category, 18 respondents (52.9%) were in the medium category, and 14 respondents (41.2%) were in the severe category. Thus, as many as 32 respondents (94.1%) were in the medium to severe category.

The dominance of the medium and severe categories shows that most of the respondents experience a fairly significant burden of symptoms. These findings are consistent with the characteristics of an average SNOT-22 score of 48.59, which indicates a considerable quality of life impact on the study population.

These results can be compared to *Sharma et al*.'s 2023 study that used SNOT-22 to assess RSK patients before and after FESS. In the study, most of the patients were in the score range of 20–50 and some had a score of >50 before the action. After FESS, SNOT-22 scores decreased meaningfully (Sharma et al., 2023).

However, the light, medium, and severe categorizations in this study need to be understood as the operational categorization of the study and not the universal classification of SNOT-22. The SNOT-22 literature uses scores more as a continuous variable and discusses *minimal clinically important differences* (MCIDs) to describe clinically meaningful changes (Hopkins et al., 2009; Phillips et al., 2021; Singerman et al., 2022).

Phillips et al. in a multicenter study of 430 patients receiving medicated therapy supported an MCID value of about 12 points for SNOT-22. This suggests that a change in the SNOT-22 score of about 12 points is more relevant to assessing clinical change than simply dividing scores into mild, moderate, and severe categories (Phillips et al., 2021).

Thus, for this study, scores of 48.59 ± 19.17 should still be considered as the main results, while the lightweight, medium, and heavy categories are used as additional information to facilitate the interpretation of the respondents' distribution

The Relationship of Research Findings to the Clinical Aspects of RSK

The relatively high average SNOT-22 score in this study may reflect the heterogeneity of RSK manifestations. RSK is not a disease with a single mechanism, but a heterogeneous disease with various inflammatory phenotypes and endotypes. These differences can affect a patient's symptoms, comorbidities, therapy response, and quality of life **(Fokkens et al., 2020; Klingler et al., 2021; Yim et al., 2021).**

Smelling disorder is one of the important aspects in the quality of life of RSK patients. A multicenter study in 811 patients showed that sniffing disorders are an important component of disease burden and quality of life, particularly in patients with type 2 inflammation (Macchi et al., 2023).

In addition, comorbidities can affect the patient's quality of life. Recent reviews show that RSK is often associated with comorbidities such as asthma, allergies, COPD, obesity, and other inflammatory conditions. These comorbidities can aggravate the perception of symptoms and contribute to therapy resistance (Choi et al., 2024).

Research on allergic rhinitis in RSK patients also showed that RSK patients with allergic rhinitis had a slightly worse SNOT-22 score than patients without allergic rhinitis, especially in the rhinological, extrarhinological, and *ear/facial* domains (Choi et al., 2024).

This is important in interpreting the results of this study because the study only collected age, gender, and SNOT-22. The absence of the inclusion of comorbidities such as allergic rhinitis or asthma causes the possibility of their contribution to the SNOT-22 score cannot be evaluated**.**

Comparison with Previous Research

Overall, the SNOT-22 score in this study showed results comparable to some previous studies. The average of 48.59 ± 19.17 is relatively close to the average of 49.01 ± 14.83 in the study of *Keshari et al.* before FESS (Keshari et al., 2024).

Sharma et al.'s research also showed that most RSK patients before ESS had an SNOT-22 score in the range of 20–50, while others had a score of >50. The pattern is relatively

consistent with this study, as most of the respondents are in the medium and heavy operational categories **(Sharma et al., 2023).**

Meanwhile, *Plath et al*.'s study found an average score of only 20.2 in healthy individuals, much lower than the average of 48.59 in this study. These differences support that the SNOT-22 score in RSK patients is generally higher than in the population without meaningful synanosmic disease (Plath et al., 2023).

Differences in scores between studies can still occur due to different patient characteristics, including the degree of disease, the presence of nasal polyps, comorbidities, history of surgery, therapy being given, and hospital referral system. Therefore, a comparison of SNOT-22 scores between studies should be done taking into account population characteristics and study design.

Clinical implications

The results of this study show that SNOT-22 can provide additional information about the burden of disease felt by RSK patients. With an average score of 48.59, most of the patients in the study showed a considerable quality of life impact

In clinical practice, the use of SNOT-22 can help clinicians evaluate patients from a subjective perspective, especially when the degree of the patient's complaints cannot be fully described through a physical examination or supporting examination. SNOT-22 can also be used to evaluate changes in quality of life after therapy (Khan et al., 2022; Phillips et al., 2021; Riedl et al., 2021; Singerman et al., 2022).

Research by Verma et al., Gupta et al., and Keshari et al. shows that SNOT-22 scores can decrease after ESS, which describes an improvement in patients' quality of life (Gupta, 2024; Keshari et al., 2024; Verma et al., 2022).

Thus, the results of the research at Bayu Asih Purwakarta Hospital can be local basic data on the quality of life of RSK patients and can be used as a basis for future research that assesses changes in SNOT-22 scores after medical and surgical therapy.

Research Limitations

This research has several limitations. First, the number of respondents obtained was 34 people relatively small. This condition causes the results of the study to be more accurately seen as an initial description of the quality of life of RSK patients at Bayu Asih Purwakarta Hospital and limits the generalization of results to a wider population.

Second, the research was conducted at one health service center. The characteristics of patients who receive treatment at Bayu Asih Purwakarta Hospital can be different from patients in other hospitals so that the results of the study cannot be considered representative of all RSK patients in Indonesia.

Third, the research design used is descriptive of cross-section. With this design, the study only described SNOT-22 scores in one period and could not determine the cause-and-effect relationship between patient characteristics and quality of life.

Fourth, the variables collected only included age and gender as well as SNOT-22 scores. Other clinical factors such as nasal polyps, asthma, allergic rhinitis, smoking status, length of illness, surgical history, endoscopy results, and CT-scans were not analyzed. In fact, various clinical factors and comorbidities can affect the quality of life of RSK patients (Hastan et al., 2011; Orlandi et al., 2021).

CONCLUSION

Regarding participant characteristics, most patients with chronic rhinosinusitis (CRS) were female, comprising 22 participants (64.7%), while 12 participants (35.3%) were male. In terms of age distribution, the largest proportion of participants was aged 18–39 years (17 participants; 50.0%), followed by those aged 40–59 years (13 participants; 38.2%) and those aged 60 years or older (4 participants; 11.8%). The mean age was 40.79 ± 15.28 years, with an age range of 19–69 years.

Regarding health-related quality of life, the mean total score on the 22-item Sino-Nasal Outcome Test (SNOT-22) was 48.59 ± 19.17, with a median of 47 and a range of 18–100. These findings indicated a substantial patient-reported symptom burden and associated impairment in disease-specific health-related quality of life. Based on the operational classification adopted in this study, 2 participants (5.9%) were classified as having mild symptom burden, 18 (52.9%) as having moderate symptom burden, and 14 (41.2%) as having severe symptom burden. However, these categories were defined according to the study's operational criteria and should not be interpreted as universally established SNOT-22 severity thresholds.

Overall, the findings indicated that patients with CRS receiving care at Bayu Asih General Hospital in Purwakarta experienced a considerable symptom burden, as reflected by the mean SNOT-22 score of 48.59. These results highlighted the importance of incorporating standardized patient-reported outcome measures into the clinical assessment of CRS to better characterize symptoms and their effects on daily functioning and health-related quality of life. Nevertheless, because the study employed a descriptive cross-sectional design and univariate analysis, the age and sex distributions were reported solely to characterize the study population. Consequently, the findings did not establish associations between demographic characteristics and SNOT-22 scores or identify factors contributing to differences in symptom burden.

REFERENCES

Adams, D. R., Xu, L. J., Vickery, T. W., Scangas, G. A., Bleier, B. S., Gray, S. T., & Metson, R. (2023). The impact of gender on long-term quality of life after sinus surgery for chronic rhinosinusitis. *The Laryngoscope, 133*(12), 3319–3326. https://doi.org/10.1002/lary.30719

Albu, S., Lucaciu, R., & Procopciuc, L. M. (2022). Gender differences in patients with chronic rhinosinusitis undergoing endoscopic sinus surgery. *European Archives of Oto-Rhino-Laryngology, 279*, 1–8.

Asokan, A., Mace, J. C., Rice, J. D., Smith, T. L., Soler, Z. M., & Ramakrishnan, V. R. (2023). Sex differences in presentation and surgical outcomes from a prospective multicenter chronic rhinosinusitis study. *Otolaryngology–Head and Neck Surgery, 168*(3), 491–500.

Choi, A., Xu, S., Luong, A. U., & Wise, S. K. (2024). Current review of comorbidities in chronic rhinosinusitis. *Current Allergy and Asthma Reports, 25*(1), Article 4. https://doi.org/10.1007/s11882-024-01184-4

Fokkens, W. J., Lund, V. J., Hopkins, C., Hellings, P. W., Kern, R., Reitsma, S., et al. (2020). European position paper on rhinosinusitis and nasal polyps 2020. *Rhinology, 58*(Suppl. S29), 1–464. https://doi.org/10.4193/Rhin20.600

Gupta, R. (2024). Assessment of correlation between disease specific quality of life and endoscopy score after 1 month and 6 months of endoscopic sinus surgery in patients with

chronic rhinosinusitis: A prospective study. *Indian Journal of Otolaryngology and Head & Neck Surgery, 76*(1), 112–117. https://doi.org/10.1007/s12070-023-04095-4

Hastan, D., Fokkens, W. J., Bachert, C., Newson, R. B., Bislimovska, J., Bockelbrink, A., et al. (2011). Chronic rhinosinusitis in Europe—An underestimated disease. *Allergy, 66*(9), 1216–1223. https://doi.org/10.1111/j.1398-9995.2011.02646.x

Hopkins, C., Gillett, S., Slack, R., Lund, V. J., & Browne, J. P. (2009). Psychometric validity of the 22-item Sinonasal Outcome Test. *Clinical Otolaryngology, 34*(5), 447–454. https://doi.org/10.1111/j.1749-4486.2009.01995.x

Hopkins, C., Lee, S. E., Klimek, L., & Soler, Z. M. (2022). Clinical assessment of chronic rhinosinusitis. *The Journal of Allergy and Clinical Immunology: In Practice, 10*(6), 1406–1416.

Juanda, I. J., Madiadipoera, T., & Ratunanda, S. S. (2017). Cultural adaptation, Indonesian translation, and validation of the Sino-Nasal Outcome Test (SNOT)-22. *Majalah Kedokteran Bandung, 49*(4), 267–273.

Keshari, S., Kumar, N., Varghese, A., Singh, S. P., Yadav, R., & Niranjan, A. S. (2024). Treatment outcome post endoscopic sinus surgery (ESS) in patients with chronic rhinosinusitis (CRS). *Indian Journal of Otolaryngology and Head & Neck Surgery, 76*(5), 4126–4132. https://doi.org/10.1007/s12070-024-04799-1

Khan, A. H., Reaney, M., Guillemin, I., Wright, E. D., Hopkins, C., Vautrin, A., et al. (2022). Development of Sinonasal Outcome Test (SNOT-22) domains in chronic rhinosinusitis with nasal polyps. *The Laryngoscope, 132*(5), 933–941.

Klingler, A. I., Stevens, W. W., Tan, B. K., Peters, A. T., Poposki, J. A., Grammer, L. C., et al. (2021). Mechanisms and biomarkers of inflammatory endotypes in chronic rhinosinusitis without nasal polyps. *Journal of Allergy and Clinical Immunology, 147*(4), 1306–1317. https://doi.org/10.1016/j.jaci.2020.11.037

Macchi, A., Giorli, A., Cantone, E., et al. (2023). Sense of smell in chronic rhinosinusitis: A multicentric study on 811 patients. *Frontiers in Allergy, 4*, Article 1083964. https://doi.org/10.3389/falgy.2023.1083964

Nappi, E., Marzio, V., Giombi, F., Costanzo, G., Merli, S., Nicolosi, S., Cavaglià, E., Rizzini, F. L., Traversi, S., & Vrenna, A. (2025). Chronic rhinosinusitis with and without nasal polyps: the state-of-the-art of current treatment strategies and future developments. *Frontiers in Allergy*, *6*, 1714577.

Orlandi, R. R., Kingdom, T. T., Smith, T. L., Bleier, B. S., DeConde, A. S., Luong, A. U., et al. (2021). International consensus statement on allergy and rhinology: Rhinosinusitis 2021. *International Forum of Allergy & Rhinology, 11*(3), 213–739. https://doi.org/10.1002/alr.22741

Phillips, K. M., Houssein, F. A., Boeckermann, L. M., Singerman, K. W., Liu, D. T., & Sedaghat, A. R. (2021). Multi-institutional minimal clinically important difference of the 22-item Sinonasal Outcome Test in medically managed chronic rhinosinusitis. *Rhinology, 59*(6), 552–559.

Plath, M., Sand, M., Cavaliere, C., Plinkert, P. K., Baumann, I., & Zaoui, K. (2023). Normative data for interpreting the SNOT-22. *Acta Otorhinolaryngologica Italica, 43*(6), 390–399.

Ramos, L., Massey, C. J., Asokan, A., Rice, J. D., Kroehl, M., & Ramakrishnan, V. R. (2022). Examination of sex differences in a chronic rhinosinusitis surgical cohort. *Otolaryngology–Head and Neck Surgery, 167*(3), 583–589.

Riedl, D., Dejaco, D., Steinbichler, T. B., Innerhofer, V., Gottfried, T., Bektic-Tadic, L., et al. (2021). Assessment of health-related quality-of-life in patients with chronic rhinosinusitis—Validation of the German Sino-Nasal Outcome Test-22 (German-SNOT-22). *Journal of Psychosomatic Research, 140*, Article 110316. https://doi.org/10.1016/j.jpsychores.2020.110316

Rosenfeld, R. M., Piccirillo, J. F., Chandrasekhar, S. S., Brook, I., Ashok Kumar, K., Kramper, M., et al. (2015). Clinical practice guideline (update): Adult sinusitis. *Otolaryngology–Head and Neck Surgery, 152*(2 Suppl.), S1–S39. https://doi.org/10.1177/0194599815572097

Rudmik, L., & Smith, T. L. (2011). Quality of life in patients with chronic rhinosinusitis. *Current Allergy and Asthma Reports, 11*(3), 247–252.

Sedaghat, A. R., Kuan, E. C., & Scadding, G. K. (2022). Epidemiology of chronic rhinosinusitis: prevalence and risk factors. *The Journal of Allergy and Clinical Immunology: In Practice*, *10*(6), 1395–1403.

Sharma, A., Raghuwanshi, N., Gupta, Y., Upadhyay, A., & Mundra, R. (2023). SNOT-22 a predictive and assessment tool for subjective improvement after FESS in patients of chronic rhinosinusitis. *Indian Journal of Otolaryngology and Head & Neck Surgery, 75*(Suppl. 1), 1062–1068. https://doi.org/10.1007/s12070-023-03582-y

Singerman, K. W., Phillips, K. M., & Sedaghat, A. R. (2022). Minimal clinically important difference for subdomains of the 22-item Sino-Nasal Outcome Test in medically managed chronic rhinosinusitis patients. *International Forum of Allergy & Rhinology, 12*(9), 1196–1199. https://doi.org/10.1002/alr.22967

Verma, P., Rawat, D. S., Aseri, Y., Verma, P. C., & Singh, B. K. (2022). A prospective longitudinal study of clinical outcome and quality of life assessment in patients with chronic rhinosinusitis after functional endoscopic sinus surgery using Sino-Nasal Outcome Test-22. *Indian Journal of Otolaryngology and Head & Neck Surgery, 74*(Suppl. 2), 2458–2463.

Wu, C., & Zhan, X. (2024). Sleep and psychological disorders seriously affect the quality of life of chronic rhinosinusitis patients. *European Archives of Oto-Rhino-Laryngology, 281*(7), 3615–3623.

Yim, M. T., Orlandi, R. R., Oakley, G. M., & Alt, J. A. (2021). The Sinonasal Outcome Test (SNOT-22) is a poor diagnostic tool for chronic rhinosinusitis. *Annals of Otology, Rhinology & Laryngology, 130*(11), 1220–1227.