Quality of Life Measure: Validating the 22-item Sinonasal Outcome Test (SNOT-22) in Pediatric Populations

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Background

- Chronic rhinosinusitis (CRS) is a prevalent condition that impacts quality-of-life. In the pediatric population, there is a 7.6% prevalence of CRS and 6.6% prevalence of allergic-based sinusitis (1).
- Common symptoms of CRS include nasal congestion, purulent drainage, facial pain and/or cough (2); which when they persist, they affect the patient's ability to participate and enjoy daily activities.
- Assessment of quality-of-life is critical in determining the efficacy of a treatment plan and can be achieved through questionnaires that measure subjective symptoms over time.
- Currently, the only validated quality-of-life measurement in children with sinus disease is the Sino-Nasal 5 Questionnaire (SN-5).
- The SNOT-22 is a widely-used and validated quality-of-life measure in adults. However, no comparison has been made between the SN-5 and the SNOT-22 in pediatric populations, even though the SNOT-22 is a more comprehensive questionnaire (2).
- A systematic review by Morley et al. of 15 sinonasal outcomes tests showed the SNOT-22 was superior to other tests exploring sinonasal symptoms.

Objectives

- We aim to verify internal consistency, test-retest reliability of SNOT-22 quality of life measure for chronic sinusitis among the pediatric population.

Methods

- In our study, English-speaking pediatric patients between the ages of 5 and18 years, presenting with symptoms consistent with purulent rhinorrhea, nasal obstruction, loss of smell, difficulty breathing, facial pressure/pain or cough were invited to participate.
- Patients with severe learning disabilities were excluded.
- Our control group was age-matched English-speaking pediatric patients with otologic disease.
- Patients were asked to complete both SN-5 and SNOT-22 across multiple visits. The length of follow up will be a maximum length of 6 months.
- *Reliability*: Assessed by test-retest reliability which measures the stability of an instrument over time with repeated testing.
- *Validity*: Assessed by comparing mean quality of life scores between experimental control groups that are known to have group differences. Lower score signifies higher quality of life.
- *Responsiveness*: Assessed by measuring scores before and after any medical intervention and determining if quality of life improved.
- *Clinical Interpretability:* Assessed by measuring the smallest change in scores that a group of patients can detect as real improvement/highest quality of life.

Considering how severe the problem is when you experience it and how often it happens, please rate each item below on how "bad" it is by circling the number that corresponds with how you feel using this scale:	No problem	Very Mild Problem	Mild or Slight Problem	Moderate Problem	Severe Problem	Problem as bad as it can be	5 Most important Items
1. Need to blow nose	0	1	2	3	4	5	
2. Nasal Blockage	0	1	2	3	4	5	
3. Sneezing	0	1	2	3	4	5	
4. Runny nose	0	1	2	3	4	5	
5. Cough	0	1	2	3	4	5	
6. Post-nasal discharge	0	1	2	3	4	5	
7. Thick nasal discharge	0	1	2	3	4	5	
8. Ear fullness	0	1	2	3	4	5	
9. Dizziness	0	1	2	3	4	5	
10. Ear pain	0	1	2	3	4	5	
11. Facial pain/pressure	0	1	2	3	4	5	
12. Decreased sense of smell/taste	0	1	2	3	4	5	
13. Difficulty falling asleep	0	1	2	3	4	5	
14. Wake up at night	0	1	2	3	4	5	
15. Lack of good night's sleep	0	1	2	3	4	5	
16. Wake up tired	0	1	2	3	4	5	
17. Fatigue	0	1	2	3	4	5	
18. Reduced productivity	0	1	2	3	4	5	
19. Reduced concentration	0	1	2	3	4	5	
20. Frustrated/restless/irritable	0	1	2	3	4	5	
21. Sad	0	1	2	3	4	5	
22. Embarrassed	0	1	2	3	4	5	

Figure 1. **SNOT-22 questionnaire**: quality of life measure for adults with sinonasal symptoms.

	Sinus Infection	Nasal Obstruction	Allergy Symptoms	Emotional Distress	Activity Limitations
None of the time					
Hardly any time at all					
A small part of the time					
Some of the time					
A good part of the time					
Most of the time					
All the time					

Figure 2. **SN-5 questionnaire**, quality of life measure for children with sinonasal symptoms

Results

Table 1. Patient Recruitment

Experimental Group 1st visit	Control Group 1st visit	Experimental Group 2nd visit	Control Group 2nd visit	*Patients to Recruit*
6 Patients	32 Patients	0 Patients	1 Patients	94 Experimental 68 Control

Figure 3. SNOT-22 Validity Measure

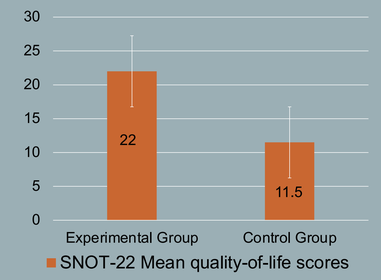

Figure 3. Experimental group with a mean value of 11 and control group with a mean value of 11.5. With the current data, p-value is 0.136 which indicates it is not clinically significant.

Figure 4. SN-5 Validity Measure

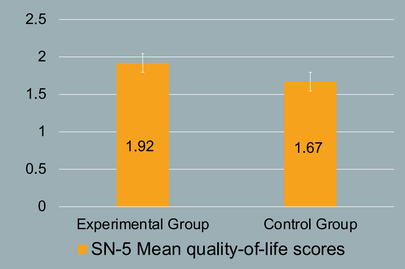

Figure 4. Experimental group with a mean value of 1.92 and control group with a mean value of 1.67. With the current data, p-value is 0.222 which indicates it is not clinically significant.

- For the SNOT-22 questionnaire, the mean value for validity measure is 22 for the experimental group and 11.5 for the control value. The P-value between these groups is 0.136, which indicates it is not clinically significant ($p<0.05$ clinically significant).
- For the SN-5 questionnaire, the mean value for validity measure is 1.92 for experimental group and 1.67 for control group. The P-value between these two groups is 0.222, also indicating this is not clinically significant.

Conclusion

- This is preliminary data and once data collection is completed, a complete analysis will be performed; we anticipate seeing clinically significant data where SNOT-22 demonstrates test-retest reliability to be validated within the pediatric population.

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