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Reliability and Validity of the Filipino Sino-Nasal Outcome Test (SNOT) 22

ABSTRACT

Objective: To translate the Sino-Nasal Outcome Test (SNOT) 22 into Filipino and establish the validity and reliability of the Filipino version of the Sino-Nasal Outcome Test (SNOT) 22.

Methods:

Design: Prospective Cohort

Setting: Tertiary Government Training Hospital

Participants: Twenty one (21) patients with rhinosinusitis with or without nasal polyposis were administered the Filipino SNOT 22 to determine reliability. Sixty three (63) patients with rhinosinusitis with or without nasal polyps and forty eight (48) controls were recruited for the validity study.

Results: The Filipino SNOT 22 had a Pearson correlation of 0.618 significant at the 0.01 level and a Cronbach's alpha of 0.76. The calculated Z-Score was 7.21 with p-value < .00001 significant at p < .05. The value of U was 300 with a critical U value at 1512.

Conclusion: The self administered Filipino SNOT 22 is a reliable and valid tool for measuring QOL among Filipino patients with rhinosinusitis.

Keywords: *sinusitis, reliability and validity, quality of life, sino-nasal outcome test 22*

According to the European Position Paper on Rhinosinusitis and Nasal Polyps 2012, rhinosinusitis is an inflammation of the mucosa of the nose and paranasal sinuses characterized by 2 or more of the following symptoms: nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip) \pm facial pain/pressure \pm reduction or loss of smell and either endoscopic signs of: nasal polyps and/or mucopurulent discharge primarily from middle meatus and/or edema/mucosal obstruction primarily in middle meatus and/or CT changes: mucosal changes within the ostiomeatal complex and/or sinuses. It may be acute if it lasts for less than 12 weeks with complete resolution of symptoms or chronic if it lasts 12 or more weeks without complete resolution of symptoms.¹

Because symptomatology drives treatment in conditions such as rhinosinusitis, it is imperative to establish the baseline symptoms of patients to better gauge the effect of medical or surgical treatment.^{2,3} The SNOT 22 is a disease-specific health related Quality of Life (QOL)

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questionnaire that is considered the most suitable tool for assessing chronic rhinosinusitis with or without nasal polyps⁴ that was validated in 2009.⁵ It has been translated into Brazilian Portuguese,⁴ Greek,^{6,7} Turkish,⁸ Danish,⁹ and Thai,¹⁰ and the reliability and validity of these translations have been established.^{4,6-10} However, the SNOT 22 has not been translated into Filipino, a development that could provide better health care for many Filipinos in the country and overseas.

We aimed to translate the Sino-Nasal Outcome Test (SNOT) 22 into Filipino and establish the validity and reliability of the Filipino version of the Sino-Nasal Outcome Test (SNOT) 22, among patients with rhinosinusitis with or without nasal polyposis compared to asymptomatic controls.

METHODS

Instrument Development

To develop the Filipino SNOT 22, a SNOT 22 form in English was sent to two (2) independent interpreters who translated it into Filipino. Each translated SNOT 22 form was then back-translated into English by another group of individuals who were knowledgeable in Filipino and English as well as in ear, nose and throat (ENT) concepts. The 2 Filipino translations were then consolidated into one questionnaire by this group.

Reliability Assessment

With Institutional Ethics Review Board approval, the consolidated questionnaire was administered to patients seen at the ENT Outpatient Clinic who were 19 years or older, could read and write in Filipino, were diagnosed to have rhinosinusitis with or without nasal polyps and consented to be part of the study. After obtaining consent, the questionnaire was administered on the first consult and then again on follow up. Each time, the questionnaire was provided with a pen or pencil by a resident physician, with no additional instructions or guidance in answering. Accomplished forms were collected after a maximum of thirty (30) minutes and collated by the primary investigator over a period of 8 weeks, from December 2016 to February 2017.

Validity Assessment

After the test-retest period, the Filipino SNOT 22 was administered to patients seen at the ENT Outpatient Clinic who were 19 years or older, could read and write in Filipino, were diagnosed to have rhinosinusitis with or without nasal polyps and consented to be part of the study. The control group was composed of volunteers meeting the same criteria except rhinosinusitis. After written consent was obtained, each test form and a pencil was given to participants and controls by a resident physician with instructions for their

accomplishment in a designated area within the clinic. No further guidance was given and questionnaires were collected within thirty (30) minutes of administration. Accomplished forms were collated by the primary investigator over the test period of 24 weeks from March 2017 to August 2017.

Statistical Analysis

Data was tabulated using Microsoft® Excel for Mac Version 16.12 (180410) (Microsoft Corporation Redmond, WA, USA) and analyzed using IBM SPSS Statistics software for Windows, Version 24.0 released 2015 (Armonk, NY, USA). Reliability and internal consistency were measured by Cronbach alpha and test-retest reliability measured by Pearson correlation coefficient. A Pearson correlation coefficient of ≥ 0.60 was deemed acceptable¹⁰ while the minimum acceptable value of Cronbach alpha was set at ≥ 0.7 . Validity was determined using the Mann-Whitney U test calculator available from <http://www.socscistatistics.com/tests/mannwhitney/Default3.aspx>.

RESULTS

Instrument development

The consolidated Filipino SNOT 22 is shown in *Figure 1*.

Reliability Assessment

Twenty one (21) patients, 11 (52%) males and 10 (48%) females completed the test and retest phase of the Filipino SNOT 22. The mean age was 43 years (range, 19-79 years). The mean follow-up interval was 16 days (range, 7-49 days). *Table 1* shows the mean SNOT 22 scores of these patients on first consult and on follow up.

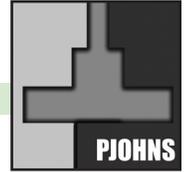
Table 1. Test-Retest Reliability

SNOT 22 SCORE	n	Mean (SD)
First Consult	21	38.4286 (28.0866)
Follow-up	21	30.2381 (25.7738)

The Filipino SNOT 22 had good internal consistency and good test-retest reliability with a Pearson correlation of 0.618 significant at the 0.01 level and a Cronbach alpha of 0.76. We did not perform individual item analysis because the Pearson correlation and Cronbach alpha were acceptable and there was no need to remove items to improve internal consistency and test-retest reliability.

Validity Assessment

For validity assessment, a total of 63 patients with rhinosinusitis with or without nasal polyposis and 48 controls participated in the



Makikita sa baba ang listahan ng mga sintomas at panlipunan/emosyonal na epekto ng iyong rhinosinusitis. Sagutin ang mga sumusunod sa abot ng iyong makakaya. Walang tama o maling kasagutan. Ikaw lamang ang maaaring makakapagbigay impormasyon tungkol dito. Lagyan ng marka ang halaga ng iyong nararanasan na problema batay sa nakaraang dalawang linggo. Maraming salamat sa iyong pagsagot. Huwag mag-atubiling magtanong o humingi ng tulong kung kailangan.

1. Lagyan ng marka kung gaano kalala ang iyong nararanasan at kung gano ito kadalas mangyari sa pamamagitan ng pagbilog ng bilang na katumbas ng iyong nararamdaman.	Walang Problema	Hindi masyadong Problema	Bahagyang Iniiindang Problema	Iniiindang Problema	Malalang Problema	Masidhing Problema	5 pinakamahalagang Karamdaman/ Problema
1. pagsinga	0	1	2	3	4	5	<input type="radio"/>
2. baradong ilong	0	1	2	3	4	5	<input type="radio"/>
3. pagbabahing	0	1	2	3	4	5	<input type="radio"/>
4. hindi tumitigil na pagtulo ng sipon	0	1	2	3	4	5	<input type="radio"/>
5. ubo	0	1	2	3	4	5	<input type="radio"/>
6. sipon na hindi lumalabas sa ilong	0	1	2	3	4	5	<input type="radio"/>
7. malapot na sipon	0	1	2	3	4	5	<input type="radio"/>
8. pagbabara ng tenga	0	1	2	3	4	5	<input type="radio"/>
9. pagkahilo	0	1	2	3	4	5	<input type="radio"/>
10. panakit ng tenga	0	1	2	3	4	5	<input type="radio"/>
11. panakit ng mukha	0	1	2	3	4	5	<input type="radio"/>
12. pagkawala/pagkabawas ng panlasa/pang-amoy	0	1	2	3	4	5	<input type="radio"/>
13. hirap sa pagtulog	0	1	2	3	4	5	<input type="radio"/>
14. nagiging sa gabi	0	1	2	3	4	5	<input type="radio"/>
15. kakulangan sa mahimbing na tulog	0	1	2	3	4	5	<input type="radio"/>
16. pagiging nang pagod	0	1	2	3	4	5	<input type="radio"/>
17. pagkapagod	0	1	2	3	4	5	<input type="radio"/>
18. pagkabawas ng pagka produktibo	0	1	2	3	4	5	<input type="radio"/>
19. pagkabawas ng pokus sa pag-iisip	0	1	2	3	4	5	<input type="radio"/>
20. pagiging irritable/pagkainis	0	1	2	3	4	5	<input type="radio"/>
21. malungkot	0	1	2	3	4	5	<input type="radio"/>
22. nahihya	0	1	2	3	4	5	<input type="radio"/>
2. Lagyan ng marka ang pinakamahalagang karamdaman o problema na nakakaapekto sa iyong kalusugan (pinakamataas/ pinakamaraming punto na ang 5)							

Figure 1. Filipino Sino-Nasal Outcome Test (SNOT) 22

study. Of the 63 rhinosinusitis patients, 32 (51%) were male and 31 (49%) were female. The mean age was 39 years (range, 19-69 years). Of the 48 controls, 21 (44%) were male and 27 (56%) were female. The mean age was 40 years (range, 22-72 years). Table 2 shows the SNOT 22 scores of these patients.

Table 2. Validity (Mann-Whitney U Test)

SNOT 22 SCORE	n	Mean (SD)
Patients with CRS	63	39.1270 (18.4544)
Controls	48	11.9375 (10.5516)

The Filipino SNOT-22 is a valid measuring tool with a calculated Z-Score of 7.21 with p-value < .00001 significant at $p < 0.05$. The Mann-Whitney U value was 300.

DISCUSSION

This study has found that the Filipino SNOT 22 is a valid and reliable tool to measure symptoms in adult Filipino patients suffering from chronic rhinosinusitis with or without nasal polyps.

Reliability of a disease-specific questionnaire can be measured through its internal consistency and test-retest reliability. The Filipino SNOT 22 showed a Cronbach's alpha of 0.76, and a Pearson correlation coefficient of 0.618 significant at the 0.01 level, comparable with findings of other studies.^{4,6-10}

Validity is demonstrated by being able to discriminate patients with CRS as opposed to those without CRS. Using a Mann-Whitney calculator, the U value was determined to be 300 with a Z-Score of 7.21 and a p-value of < .00001 significant at $p < 0.05$. The computed U value is statistically significant as it is lower than the critical value set

at 1512. This means there was a significant difference between the scores of those with rhinosinusitis with or without nasal polyps and those without rhinosinusitis. This is also comparable to the results of previously cited studies.^{4,6-10}

Part of the limitations of our study would be the unpredictability of follow-up as patients can opt not to follow-up promptly and this delay may have an impact on the symptoms and scores being experienced by patients. We recommend the use of the Filipino SNOT 22 among preoperative and postoperative patients so that responsiveness of the tool can be further quantified. Future studies with larger samples may further establish its reliability and validity.

In conclusion, the Filipino SNOT 22 is a reliable and valid measuring tool for use among Filipino patients suffering from rhinosinusitis with or without nasal polyps. It can make it easier for patients to communicate their subjective complaints as the questionnaire is in a language that they can understand better. It may also serve as a more reliable guide to clinicians in decision-making and monitoring patient response to treatment.

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