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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи.** Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html. В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректуре авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საყურადღებო!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე, დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემავსებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიის ფოტოსურათები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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LINGUISTIC VALIDATION, PSYCHOMETRIC EVALUATION AND CROSS- CULTURAL ADAPTATION OF THE GEORGIAN SINO-NASAL OUTCOME TEST

Berdia Beridze*, George Gogniashvili.

College of medicine, Georgia.

Abstract.

Purpose: The objective of this prospective case-control study was to perform translation, cross-cultural adaptation, and validation of the Sino-nasal outcome test 22 (SNOT-22) into the Georgian language.

Methods: The translation and validation of the SNOT -22 questionnaire was performed using the forward-backward translation technique. After proper translation, the translated questionnaire was completed by chronic rhinosinusitis (CRS) patients before and after functional endoscopic sinus surgery (FESS) and by healthy individuals as controls.

Results: SNOT22 was translated into the Georgian language; the pilot study involved 34 patients, the test-retest group consisted of 30 patients with CRS and the control group of 71 patients without CRS complaints; 34 patients were evaluated before surgery and 3 months after surgery. The results showed a good internal correlation with Cronbach's alpha - 0.88 at the initial examination, and 0.93 at the retest examination; both values suggest good internal consistency within SNOT-22. Pearson's correlation coefficient was 0.72 ($p<0.001$), revealing a good correlation between initial scores and retest scores. Our sample of healthy individuals had a median score of 10,11 points and the instrument was able to differentiate between the healthy and the patient group, demonstrating its validity ($p<0.0001$).

Conclusions: The Georgian version of the SNOT-22 questionnaire is a valid outcome measure for patients with CRS.

Key words. Chronic rhinosinusitis, SNOT-22, Polyposis, Translation, Validation, CRS, Health related quality of life, Quality of life, CRSwNP, Disease specific tool.

Introduction.

Chronic rhinosinusitis (CRS) is a complex, heterogeneous inflammatory disease affecting 5–12% of the world's population [1]. CRS is a chronic condition whose incidence and prevalence are regarded to be increasing in significance. It has an impact on the patient's health-related quality of life (HRQoL). In this regard, it is similar to diabetes and cardiovascular disease [2,3]. Moreover, CRS has a significant impact on the healthcare system. The annual cost per CRS patient is expected to be up to €1501 [4]. CRS in adults is described as an inflammation of the nose and paranasal sinuses characterised by two or more symptoms lasting more than 12 weeks. One of the symptoms should be either nasal obstruction or nasal discharge, accompanied by facial pain/pressure, a diminished or absent sense of smell, and either endoscopic evidence of nasal polyps or mucopurulent discharge [5].

The World Health Organization (WHO) defines quality of life (QoL) as a person's impression of their situation in life in respect to their goals, expectations, standards, and worries [6]. The quality of life can be impacted by a medical disease or its

treatment. HRQoL can be diminished by a patient's health and enhanced by adequate medical care.

No population-based epidemiological research regarding CRS have been conducted in Georgia. Several criteria are used by otorhinolaryngologists to assess the severity of symptoms and the efficacy of CRS treatment. In addition to new treatment options for CRS including monoclonal antibodies, it is necessary to have a validated QoL assessment method in order to administer treatment [5].

Due to its reliability, validity, responsiveness, and ease of use, as well as its high dependability for postoperative examination [7], SNOT-22 was chosen to evaluate CRS patients. For the examination of patients with CRS, the questionnaire we picked demonstrated superior to the other 14 QoL surveys. (Table 1). According to Browne et al. The SNOT-22 assesses a vast array of health and HRQoL issues, including physical problems, functional limits, and emotional effects [8].

The questionnaire comprises 22 symptoms indicative of the patient's health burden [9]. Each item measures the intensity of the symptom on a scale ranging from 0 (no problem) to 5 (worst possible symptom), yielding a maximum total questionnaire score of 110. It has been adapted and validated in multiple other languages to date [10-23].

However, no specific HRQoL for CRS has been adapted in Georgian. This study's objectives were to translate and adapt the SNOT-22 questionnaire to the Georgian language, test its psychometric qualities, and evaluate the quality of life among the general population and CRS patients before and after treatment.

Materials and Methods.

This prospective study was carried out at the Department of Otorhinolaryngology, Tbilisi Medical Academy, New Vision University, Tbilisi, Georgia. The study was approved by the Tbilisi Regional Biomedical Research Ethics Committee (N 07-15-2020/B). Prior to their enrollment in the trial, all patients provided written informed consent. The study only included CRS patients who met the EPOS criteria. Age under 18, pregnancy, and refusal to participate in the study were exclusion factors.

Translation:

The translation required five major stages: translation, back-translation, a review by the translation and back-translation committee, an equivalent pre-test with monolingual individuals, and a re-evaluation of the score weights, as proposed by Guillemin [24].

Pilot study:

Before the final version of the questionnaire was created, 34 CRS patients were recruited. Each patient independently completed the preliminary translated version of SNOT-22

Table 1. Disease specific tools.

	RQLQ	SS	F	CST	CSS	RSOM	RSDI	RSI	SN16	RSUI	SNAQ	SN5	Col	SN20	SN22
Date	1991	1991	1993	1993	1995	1995	1997	1997	1998	1988	2000	2001	2002	1998	2000
Items	28	5	12	12	6	31	30	12	16	10	11	5	7	20	22
I.C.	0.94		0.78	0.78	0.73				0.89	0.40		0.70		0.90	0.91
R					0.82			1.25	0.69	0.72	1.08	0.74		0.59	0.81
Scale	7	10	4	4	4	6	5	6	5	4	5	7	5		5

RQLQ rhino conjunctivitis quality of life questionnaire, *SS* sinusitis survey, *F* Fairley's symptom questionnaire, *CST* chronic sinusitis type specific questionnaire, *CSS* chronic sinusitis survey, *RSOM* rhinosinusitis outcome measure, *RSDI* rhinosinusitis disability index, *RSI* rhinosinusitis symptom inventory, *SN20* sinonasal outcome test-20, *SN16* sinonasal outcome test-16, *RSUI* rhinitis symptom utility index, *SNAQ* sinonasal assessment questionnaire, *Col* cologne questionnaire, *SN22* sinonasal outcome test-22, *R* responsiveness, *IC* internal consistency

and discussed the wording and cultural significance of each item with the clinician to ensure that the questionnaire was culturally appropriate. Following the pilot study, a few minor modifications were made to the questionnaire based on patient feedback, resulting in the final version of the Georgian SNOT-22 questionnaire.

Test-Retest study:

In a random sample of 55 patients with CRS with or without nasal polyps, test-retest reliability was determined. Patients were asked to complete a questionnaire 14 days apart. The first time was at a typical doctor's visit, and the second time was by letter or a second visit.

Control study:

A total of 71 asymptomatic study participants were recruited from hospital personnel and university students. Participants were asked if they suffered from rhinitis or CRS and if they used nose medication. If any of these questions yielded a positive response, the participants were excluded from further study.

Surgery study:

In the study group, 34 patients who participated in the pilot study were subsequently enrolled in the study assessing surgical responsiveness. All 34 individuals underwent endonasal surgical therapy. In the "surgical" study group, patients were assessed twice: at baseline and three months after surgery.

Statistical analysis:

Internal consistency and test-retest reliability of the Georgian version of the SNOT-22 were examined. Internal consistency describes how pieces within an instrument relate to one another. Using Cronbach's alpha, internal consistency was determined. Estimates of Cronbach's alpha between 0.70 and 0.95 were deemed indicative of acceptable internal consistency [26]. Test-retest reliability assesses the consistency of questionnaire responses across a period of time during which symptoms are not anticipated to change. The correlation between the test and retest must be at least 0.70 [9].

Using the Mann–Whitney test, the validity of the measurements is determined by the questionnaire's ability to accurately represent differences between previously established groups. We evaluated the questionnaire's ability to produce different scores between the group of patients with CRS with or without nasal polyps and the group of healthy volunteers [23].

The responsiveness of a questionnaire is its ability to identify clinical changes over time. Comparing pre- and post-operative scores using the paired t-test. The size of the effect, which is

the mean value of the score variation divided by the standard deviation of the beginning values, can also be used to evaluate responsiveness. By convention, an effect magnitude between 0.2 and 0.5 is considered a moderate increase in quality of life; between 0.5 and 0.8 is a considerable improvement; and greater than 0.8 is a substantial improvement [9].

All statistical analyses were conducted using IBM's SPSS 20 statistical programme. Results with a p-value less than 0.05 were considered statistically significant.

Results.

Pilot study:

The pilot study included 34 participants, 11 of whom were female (32.4%) and 23 of whom were male (67.6%). Everyone was diagnosed with CRS, with or without nasal polyps. The average age was 48.79 ± 15.20 years old (range 17-80 years). Due to the fact that five patients were unable to locate the area containing the five most significant symptoms, we decided to bold this section of the table and add an arrow to indicate its location.

Test-Retest study:

Test-retest reliability was determined in a random sample of 55 CRS patients with or without nasal polyps. The exclusion criteria for the test-retest were a change in treatment and an abrupt change in symptoms related to a common cold or influenza during the interval between the two tests (10 persons). Fifteen participants were removed from the study because they were unavailable for a second review of the questionnaire or because more than fifty percent of the questionnaire slots were unfilled. Thirty individuals were approved for test-retest.

The average age of patients was 50.5 years (range 26-70 years). The subjects consisted of 33.3% females and 66.6% males. The initial mean SNOT-22 score was 56.52 ± 12.24 and the retest score was 58.44 ± 14.40. Cronbach's alpha was 0.88 at the initial assessment and 0.93 at the retest; both numbers indicated that the SNOT-22 had a high degree of internal consistency. Each item's Pearson's correlation analysis resulted in a mean value of 0.72 ($p < 0.001$), indicating a significant correlation. Correspondingly, a high association was found between the initial test scores and the retest scores.

Control Study:

Control group included 71 volunteers — 26 female (36.6%) and 45 males (63.4%). The mean age was 45.10 ± 11.37 years, with a range of 30 to 70 years. The control group's mean score was 10.11, with a standard deviation of 8.309. The confidence

interval for the mean values was 8.14–12.07 at 95% confidence. Before surgery, we compared the control group to the patient group. The mean SNOT-22 score in the control group was significantly lower than the mean SNOT-22 score in patients with CRS before surgery, which was 61.44 ± 14.24 . The tool was able to distinguish across patient groups ($p < 0.0001$), indicating a high level of discriminant validity.

Pre- and Postoperative groups:

Three months after surgical treatment, the SNOT-22 scores of 34 CRS patients were compared to their pre-operative ratings for examination of response. The surgical group comprised of 11 female (32.4%) and 23 male (67.6%), with a mean age of 48.79 ± 15.2 years (from 17 years to 80 years). The mean score at the pre-operative evaluation was significantly higher (61.44 ± 14.24) than it was three months after surgery (12.32 ± 13.85) ($p < 0.0001$, $t = 9.85$) (Figure 1). The statistically substantial decrease in post-operative ratings indicated the instrument's responsiveness. Examination of pre-operative scores and scores obtained three months after surgery demonstrated a mean change in scores of 49.12 ± 16.59 . The magnitude of the surgery's effect after three months was 1.32, which was considered high (> 0.8).

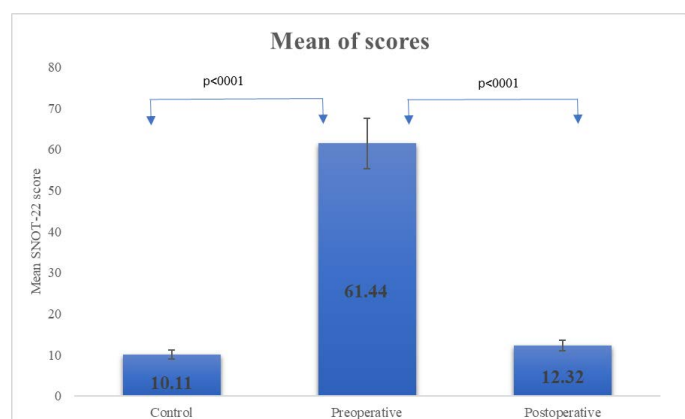


Figure 1. Responsiveness of the Georgian SNOT-22 questionnaire. Comparison of the mean SNOT-22 scores between the preoperative, postoperative and the control groups. Black lines indicate 95% confidence interval.

Discussion.

We found that the Georgian version of SNOT-22 is a viable outcome-measuring instrument for Georgian patients with sinonasal illness. It exhibits excellent internal consistency, reliability, concurrent validity, and responsiveness.

This questionnaire has already been translated and altered for use in a variety of cultural and language settings. In this work, the SNOT-22 was translated and converted into Georgian using best practises for translation and cultural adaptation [25].

The high usefulness of the SNOT-22 as an assessment tool in patients with chronic rhinosinusitis stems from its capacity to represent the symptom-specific state of the person, highlighting the factors that have the greatest impact on QOL. In addition, the SNOT22 is of utmost importance when surgical therapy is being considered, as it can aid in evaluating the effect of surgery

and the likelihood of reaching a realistic outcome [26-31].

The questionnaire focuses on a patient's physical, functional, and emotional status; hence, it is essential that it be translated into the patient's native language. Since there was no other standard HRQoL questionnaire translated into Georgian, it was not able to measure the quality of life of CRS patients. We chose to translate, evaluate, and culturally adjust the questionnaire into Georgian so that it may be used in all Georgian ENT clinics. As shown in Table 2, our results were consistent with the original validation by Hopkins et al [9] and comparable to other language translations.

A Cronbach's alpha between 0.70 and 0.95 implies that health surveys have strong internal consistency. According to our data, the SNOT-22 translated in Georgian has a Cronbach's alpha of 0.88, indicating good internal consistency and high reliability of the questionnaire.

Similar to earlier investigations, test-retest reliability was outstanding and indicated proper reliability (Table 2).

Except for Eisenbach et al. [12], our preoperative CRS group exhibited relatively high SNOT-22 scores compared to prior research (Table 2). This may be a result of the Georgian theory that individuals should delay doctor visits as long as possible. The fact that these patients were scheduled for FESS surgery suggests that their condition was likely relatively advanced. After FESS, patients with higher scores report a considerably greater increase in quality of life.

When comparing the mean scores of the questionnaire between the CRS and control groups, as well as between the preoperative and postoperative groups, the Georgian version demonstrated excellent clinical validity ($P .0001$) and responsiveness ($P .0001$). These findings support the application of the SNOT-22 scale as a reliable tool for assessing the quality of life (QoL) of patients affected by CRS in the Georgian-speaking population, demonstrating that it can distinguish CRS patients from healthy patients and is sensitive to changes after surgical intervention, as reported by other authors (Table 2).

According to the findings of this study, SNOT-22 questionnaire translated in Georgian is able to assess changes in HRQoL among surgery patients. We discovered that the difference between the preoperative and postoperative mean SNOT-22 scores was 49.12 points. At three months, the amplitude of the surgical effect was 1.32 and was classed as high (> 0.8). This suggests that FESS is an effective treatment option for the population studied.

Conclusion.

For patients with CRS, the Georgian version of the SNOT-22 questionnaire is a valid outcome measure. It has showed strong internal consistency, validity, reproducibility, and responsiveness and is recommended for use with Georgian-speaking CRS patients around the world.

Lits of Abbreviations.

SNOT-22: Sino-Nasal Outcome Test 22

FESS: Functional Endoscopic Sinus Surgery

CRS: Chronic Rhinosinusitis

HRQoL: Health-Related Quality of Life

Table 2. The values for the Georgian validation are presented in the row marked Georgian.

Language	Internal consistency	Test-retest	Validity	Responsiveness		Mean score
					CRS	Controls
Arabic (11)	0.803	0.907	<0.001	<0.001	64.2	19.5
Brazilian Portuguese (23)	0.88	0.91	<0.0001	<0.0001	62.4	11.4
Czech (19)	0.9	0.86	NA	NA	38.5	13.7
Danish (20)	0.83	0.7	NA	NA	29.7	NA
English (9)	0.91	0.93	<0.0001	<0.0001	42.0	9.3
French (10)	0.93	0.78	<0.0001	<0.0001	41.0	8.3
Georgian	0.88	0.93	<0.0001	<0.0001	61.44	10.11
German (22)	0.897	0.861	<0.0001	<0.0001	41.69	10.1
German (Austria) (27)	0.93	NA	<0.001	<0.001	38.0	15.1
Greek (15)	0.84	0.91	<0.0001	<0.0001	49.6	13.0
Hebrew (16)	0.94	0.88	<0.0001	<0.001	50.4	13.2
Italian (13)	0.86	0.85	<0.008	<0.001	48.9	14.3
Lithuanian (17)	0.89	0.72	<0.0001	<0.0001	52.4	16.8
Moroccan (28)	0.968	0.993	<0.0001	<0.0001	50.4	14.5
Russian (12)	0.816	0.98	<0.0001	<0.0001	67.6	9.3
Spanish (18)	0.91	0.87	<0.0001	<0.0001	47.2	4.5
Thai (29)	0.94	0.64	NA	NA	38.2	NA
Finnish (31)	0.879	0.93	<0.0001	<0.0001	46.8	8.9
Turkish (30)	0.88	0.97	<0.0001	<0.0001	64.3	15.6

Internal consistency shown as Cronbach's alpha coefficient, test-retest reliability shown as Spearman's or Pearson's coefficient or ICC, validity shown as Student's t test or Mann-Whitney U test, responsiveness shown as Student's t test or Mann-Whitney U test

The bold values are the values of this manuscript. This should help the reader to find the new values and to compare them to the other published values.

QoL: Quality of Life

Conflict of Interest.

The authors declare that they have no conflict of interest

Ethical approval.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Tbilisi Regional Biomedical Research Ethics Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Approval NR: N 07-15-2020/B

Statement of Human and Animal rights.

All procedures in this study were conducted in accordance with the Tbilisi Regional Biomedical Research Committee Approval NR: N 07-15-2020/B

Informed consent.

Informed consent was obtained from all individual participants included in the study

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