Author’s response to reviews

Title: Chinese Version of Narcolepsy Severity Scale: A Validation Study

Authors:

Hui Ouyang (happyluckyfish@163.com)

Fang Han (490644424@qq.com)

Qiwen Zheng (zhengqiwen325@163.com)

Jun Zhang (zhangjun@pkuph.edu.cn)

Version: 2  Date: 24 Nov 2019

Author’s response to reviews:

Dear Editors and Reviewers:

Thank you for your letter and for the reviewers’ comments concerning our manuscript entitled “Chinese Version of Narcolepsy Severity Scale: A Validation Study”. Those comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our researches.

In response to the reviewer’s comments, the following modifications were made to ensure that the manuscript is clearer and more consistent: 1. A native English speaker modified our manuscript and we standardized the abbreviation format. 2. We standardized the definition and description of psychometric attributes and used more standardized statistical methods for some psychometric attributes, such as replacing the student’s t-test with ICC to for test-retest reliability, and using K-S instead of histograms to describe the distribution of the sample. 3. We provided a clearer description of the research process by including enrollment criteria and the content validity of the questionnaire. 4. We removed unnecessary content and content that may lead to misunderstanding, such as the ROC curve and the distribution histogram of the total scores. 4. We adjusted the structure of the manuscript by including a more comprehensive discussion in the limitations section and reducing the length of the discussion section.

A list of changes to the manuscript and the point-by-point reply to the comments of the reviewers has been attached.

Hopefully we have made an appropriate revision base on the reviewers’ comments. Please let me know if there is anything else we need to do with the revision, and we’ll prepare it as soon as possible.

We thank you wholeheartedly for your excellent work. Your kind assistance is greatly appreciated. We look forward to any future correspondence.
Yours sincerely, Jun Zhang

List of responses:

Responses to the reviewers’ comments:

Reviewer #1:

Thank you for your positive comments!

1. Response to comment: The text requires proof reading regarding the English grammar. 
Response: We are very sorry that we have made grammatical mistakes that may have made it difficult for you to read the article. As we are not native speakers, we recruited a native English speaker to review our manuscript and correct mistakes. We believe the quality of the writing has improved.

2. Response to comment: The part presenting the ROC analysis regarding the treatment status may be somewhat misleading, the test for sensitivity whether the patient is treated or not, is not the aim of the study. It is more important to stress the broad spectrum of scale scores in those subgroups.

Response: Thank you for your comment and helpful suggestions. Since the aim of the study is to validate the Chinese-NSS in the Chinese narcoleptic population, as the reviewer has mentioned, testing whether patients are treated or not is not the aim of this study. Considering the reviewer’s suggestion, we have removed the section presenting the ROC analysis in order to avoid misleading readers. In addition, we added a description of the scores of the subgroups on page 12, paragraph 1. Unfortunately, we are not conducting clinical trials at present, and there is still a lack of objective standards for symptom control. Considering the individual differences in patients’ responses to drugs, we adjust the drugs according to patients’ subjective symptoms and quality of life alleviation. However, we think your suggestion is excellent; we will divide the treated group into more subgroups and study the effects of drugs in detail in our future clinical trials.

The revised text:

The NSS total score was significantly higher in the untreated than treated group (30.08+9.14 versus 25.44+11.21, p=0.017). The results are shown in Table 4 (The demographic and NSS total score of drug-free and treated narcolepsy patients)

Special thanks to your good comments!
Reviewer #2:

1. Response to comment: The abbreviation used in the abstract should be spell out.

Response: Thank you for your helpful comment. We have carefully reviewed the abstract and spelled out the abbreviations according to your suggestion (page 2, paragraph 3).

The revised text:

Abstract

Background: The narcolepsy severity scale (NSS) was developed to measure the severity and consequences of symptoms in patients with narcolepsy. The scale has been validated in France, though no other studies have further validated this instrument. The current study aimed to present psychometric properties and describe the score distribution of the Chinese-NSS.

Methods: 122 patients with narcolepsy (41 females and 81 males; mean age 26.14±15.40 years) participated in the study. All patients completed the Chinese-NSS. Cronbach’s α, item-total score correlations, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and correlations between NSS total scores and clinical or sleep parameters were then calculated. The receiver operating characteristic (ROC) curve was used to discriminate between treated and drug-free groups.

Results: EFA yielded a three-factor model. CFA of the three-factor model yielded acceptable model fit to the data after important relationships were modeled. Internal consistency was acceptable (Cronbach’s α=0.799). The NSS total score had significant correlations with the Epworth sleepiness score (0.447), pediatric daytime sleepiness scale (0.318), the insomnia severity index (0.592), Beck depression inventory (0.593), EurQol five dimensions-utility (0.457), EurQol five dimensions -VAS (-0.323), the sleep disturbance scale for children (0.440), the children depression inventory (0.553), and the pediatric quality of life inventory (0.555) total scores, demonstrating acceptable convergence as predicted.

Conclusions: The current study is the first validation study of the narcolepsy severity scale in an Asian population. The findings validated the Chinese-narcolepsy severity scale in a Chinese population with acceptable psychometric properties. There are minor differences between our results and those of the original study due to cultural differences.

2. Response to comment: Discussion is too long. It should be condense the length.

Response: We agree with the reviewer’s comment. We have rewritten the discussion section to make it shorter and easier to read according to your suggestion (page 12-16).

Special thanks for your good comments!
Reviewer #3:

1. Response to comment: I recommend authors to follow Terwee et al (Journal of Clinical Epidemiology, 2007; 60:34-42) and COSMIN taxonomy of measurement properties (www.cosmin.nl) to name, describe and assess correctly the psychometric attributes. "item convergent validity" is not a part of internal consistency. Temporal stability (test-retest reliability) should be measured by means of intraclass-correlation coefficient and kappa index. 

Response: Thank you for your helpful suggestions. We have corrected the name, description, and assessment of the psychometric attributes according the reviewer’s suggestions. The test-retest reliability was recalculated by means of intraclass-correlation coefficient according to your suggestions (pages 9-12).

The revised text:

In the original version, the psychometric attributes were described as ” Internal consistency and Item convergent validity”, ” Temporal stability”, ” Factor analysis”, ” Sensitivity and discriminate validity”, ” Confirmatory factor analysis” and ”Criterion validity”. In the revised version, these psychometric attributes were changed to “Internal consistency”, “Reproducibility”, “ Content validity”, “ Structural validity”, “ Convergent validity”, “ Discriminative validity” and ” Floor or ceiling effects”, following Terwee et al (Journal of Clinical Epidemiology, 2007; 60:34-42) and COSMIN taxonomy of measurement properties (www.cosmin.nl).

The test-retest reliability was recalculated: In terms of the test-retest reliability of the Chinese-NSS, the reliability coefficient (intra-class correlation coefficients (ICC)) was 0.923 (95% CI: 0.779-0.975, p<0.001).

2. Response to comment: Pediatric patients may find difficulties to understand and answer the rating scale. Please, indicate how many pediatric patients you included and if there were differences in NSS scores between children and adults.

Response: Thank you for your helpful comment. Indeed, it is worth considering that pediatric patients may find it difficult to understand and answer the rating scale. However, since pediatric narcoleptic patients and adult narcoleptic patients have similar symptoms, the scale is applicable to both groups. In order to ensure that the collected population was representative, we selected samples randomly. We conducted a pilot study before our validation study and confirmed that pediatric patients could understand the meaning of the scale. Patients were excluded from the study if they were not able to fill out the questionnaire (for example, patients younger than 8 or have serious psychiatric disorders). In fact, since the onset age of pediatric patients reached a peak at 15, there were few very young pediatric patients in the narcoleptic patients who can not cooperate in filling out the questionnaire were received: only 4 patients younger than 8 were excluded. We have added a description of this process and the entry criteria for pediatric patients to clarify this matter. Following your suggestions, we have indicated the number of pediatric patients involved in the study and included that there were no differences in NSS scores between pediatric patients and adult patients after analysis (26.12±8.04 and 28.41±12.25, p>0.05). For
very young children, however, measures other than the questionnaire should be developed to measure their symptoms. This has been added to the discussion section (page 5, paragraph 3; page 7, paragraph 1; page 9, paragraph 3; page 16, paragraph 2).

The revised text:

The inclusion criteria were patients who were diagnosed with narcolepsy following the ICSD-3 criteria [10] and who were willing to participate in interviews. Patients were excluded from the study if they could not fill out the questionnaire (for example, patients who were younger than 8 or have serious psychiatric disorders).

These patients were selected randomly from the target population. Face validity was confirmed and wording and contents were checked in the pilot survey. Both adult patients and pediatric patients agreed that the NSS was straightforward and easy to understand.

In total, 122 consecutive patients with narcolepsy were included in this study (53 pediatric patients and 69 adult patients). There were no differences in NSS scores between the total scores of the pediatric group and the adult group (26.12+8.04 and 28.41+12.25, p>0.05).

Some limitations of this study should be acknowledged. Third, only patients older than eight years old were included in the study, so this questionnaire may not be applicable to very young children.

3. Response to comment: Indicate what subscales and items compose the NSS.

Response: Thank you for your helpful suggestions. We have added further information about the subscales and items of the NSS. This information is available in Appendix 2 (page 7, paragraph 2).

The revised text:

The Chinese-NSS is composed of 15 items and is divided into 3 subscales. The first subscale concerns sleepiness, the second subscale concerns cataplexy, and the third subscale concerns hallucination, sleep paralysis, and disturbed nighttime sleep (the items were shown in Appendix 1 and Appendix 2).

4. Response to comment: It is not necessary to display the histogram of mean NSS score for full sample, also, please, indicate if you have used other tests to prove the normality of distribution.

Response: Thank you for your helpful suggestion. We have deleted the histogram of the NSS score in the revised manuscript and added the results of the normal distribution test to indicate
the normality of distribution according to your suggestions (K-S test, p>0.05) (page 9, paragraph 3).

The revised text:

According to the tests of normality (K-S test), the distribution of the total scores for the narcolepsy population was in line with normal distribution (p=0.079).

5. Response to comment: The interval for test-retest reliability is too long, it should be no more than 7-14 days long. This should be acknowledged as a limitation.

Response: Thank you for your helpful suggestion. Since narcolepsy is a rare disease and our patients came from all over China, it was not convenient to hold a second test in 7-14 days. Although the ideal interval for test-retest is no more than 14 days, fortunately, according to our clinical experience, the progress of narcolepsy would not be obvious during the interval for the test-retest reliability in this study. We have acknowledged this as a limitation according to your suggestions (page 16, paragraph 2).

The revised text:

Some limitations of this study should be acknowledged. Second, the interval for test-retest reliability is relatively long. Although during this period, patients’ conditions are stable and medication is regular, an interval less than two weeks would be preferable.

6. Response to comment: change "discriminate" validity to "discriminative" validity. - Regarding "criterion" validity, Please, change the title to "convergent validity".

Response: We thank you for your helpful suggestions and apologize for the inaccurate expressions; we have corrected them in the revised manuscript. We have invited a native speaker to review the manuscript to revise spelling mistakes and followed the Terwee et al. (Journal of Clinical Epidemiology, 2007; 60;34-42) and COSMIN taxonomy of measurement properties (www.cosmin.nl) to name and describe the measurement properties (page 9-12).

The revised text:

In the original version, the psychometric attributes were described as” Sensitivity and discriminate validity”,” Confirmatory factor analysis” and ”Criterion validity”. In the revised version, these psychometric attributes were changed to “Internal consistency”, ”Reproducibility”, ”Content validity”, ”Structural validity”, ”Convergent validity”, ”Discriminative validity” and ” Floor or ceiling effects”
7. Response to comment: The sample size could be enough for exploratory factor analysis, for confirmatory factor analysis, I suggest not to include this kind of analysis in the manuscript.

Response: Thank you for your helpful suggestion. We have acknowledged this in the limitations section and removed the relevant confirmatory factor analysis according to your suggestions, since narcolepsy is a rare disease with prevalence ranges from 0.002% to 0.167% worldwide. Although our center is the largest in China and receives patients from all over the country, we found collecting samples highly challenging. Fortunately, our sample size seemed to be sufficient to perform the validity and reliability studies according to the recommendations of Hayran M (Hayran M HM: Basic statistics for medical researches Omega publication 2011, 1st ed) and Everitt (Everitt BS: Multivariate analysis: the need for data, and other problems. The British journal of psychiatry: the journal of mental science 1975, 126:237-240). We will try our best to enlarge the sample size in our future research.

We have mentioned this in the “limitation” part:(page 16, paragraph 2)

Some limitations of this study should be acknowledged. First, since narcolepsy is a rare disease and the collection of cases is very difficult, the sample size used in our study is limited.

Special thanks for your helpful suggestions!