



DEVELOPMENT A RELIABLE CHANGE INDEX FOR THE SELF-REPORTING QUESTIONNAIRE-20: POTENTIAL USE IN CLINICAL AND RESEARCH SETTINGS

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ABSTRACT

Introduction: The use of scales and questionnaires for the assessment of psychiatric symptoms is of great importance for the clinical context as the search. One of the questionnaires commonly adopted in this field is the Self-Reported Questionnaire-20 (SRQ-20), a twenty items scale with binary score allocated to the evaluation of non-psychotic symptoms. We found no previously published reliable changing indexes for SRQ-20. Those are statistics used to compare the probability of change between pre-intervention and post-intervention scores over just the instrument of measurement error. **Objectives:** To establish reliable clinical change parameters for the SRQ-20. **Methods:** We evaluated 270 Brazilian adults aged 27.50 ± 9.23 years and high school $13:57 \pm 3.40$. Participants answered the SRQ-20. We calculate the internal consistency by the Kuder-Richardson method, test-retest reliability (in a subsample, $n=40$) by the Intraclass correlation coefficient, and computed a reliable change index. **Results:** The internal consistency of the scale in this population was 0.86, and test-retest reliability was 0.88. The reliable change index between two applications of the SRQ-20 is significant if occur ± 4 points change ($p=0.10$) or ± 5 points ($p=0.05$). **Conclusion:** The values ± 4 ($p=0.10$) and ± 5 ($p=0.05$) can be used in clinical, and research contexts to evaluate reliable clinical change in SRQ-20 scores.

Key words: Affective disorders; Depression; Health evaluation; Evaluation; Behavior Rating Scale.

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INTRODUCTION

Mental disorders affect a significant proportion of the adult population and are a leading cause of functional and social impairment¹. Symptoms associated with mental disorders are associated significantly with impairment in activities of daily living² and reduced quality of life³.

Despite the lack of definitive etiological models explaining the causes of mental disorders, as well as biological markers for diagnosing them, methods of accurate and reliable clinical diagnosis as well efficient pharmacological and non-pharmacological interventions are increasing. Even in the absence of consensus on the etiology, classificatory manuals as the DSM-5 provide objective clinical criteria for diagnosis. In the description of symptoms, DSM-5 has also focused on characterizing the intensity of the symptoms as mild, moderate or severe⁴.

The classification of the severity of symptoms is highly relevant for clinical practice since even under treatment most patients with mental disorders do not have complete remission of psychiatric symptoms⁴. Clinical judgment of the mental health professional to monitor a patient in treatment is not always enough to capture subtle changes in the patient's condition. In this context, the use of psychometric scales and questionnaires to quantify the magnitude of symptoms is especially important.

Questionnaires and scales are composed of questions or statements in which the patient relate the occurrence of psychiatric symptoms, aspects of his personality, quality of life and other factors related to the disorder. In mental health, these instruments are used to objectively assess the presence, severity, frequency or impact of psychiatric symptoms in patient's everyday life. The successive use of scales during treatment allows the clinician to draw a response curve to treatment, a practice commonly adopted in the psychotherapeutic intervention involving cognitive-behavioral therapy⁵. These instruments must have psychometric evidence to support its accuracy, reliability, and validity for clinical use. In the case of scales used in the assessment of mental disorders, they must precisely and consistently measure the behaviors, beliefs, and reactions commonly associated with these conditions.

One of the most relevant psychometric characteristics in scales or questionnaires is the reliable change estimates (or reliable change index). These are simple statistical calculations that consider the difference between two measurements (ex: psychiatric

symptoms before and after an intervention), the reliability of the scale, and its inherent variability to create a standardized value. This value can be superimposed on a normal distribution curve to obtain significance values (ex.: $p=0.05$). In particular, where the differences between the values of the two valuations exceed the values corresponding to the level of significance, the difference observed in pre-post intervention scores are unlikely due to measurement error of the selected scale, and is due probably to another factor, such as the intervention.

The aim of this study was to develop a reliable clinical change index for the Self-Reporting Questionnaire Scale-20⁶, a brief scale for assessing non-psychotic psychiatric symptoms commonly adopted both for clinical and research practice.

METHOD

Participants

The participants composed a convenience sample consisting primarily of young adults ($n = 270$), most college students from medicine or psychology recruited in two universities. They were recruited personally by researchers or assistants and performed a series of tests and scales of attention, memory, psychiatric symptoms and personality. The participants answered most of the research (scales and questionnaires) on a virtual platform developed by the researchers⁷. A smaller subsample ($n=40$) performed the questionnaire twice, one week apart, to evaluate its reliability by test-retest measures. This study is part of a project involving the relationship between mental health and cognitive failures and was approved by the local ethics committee (registry 1.720.244), and it's by the Brazilian 196/96 National Health Board resolution and Helsinki declaration. The participants gave informed consent for participation. The study is by the Declaration of Helsinki.

Self-Reporting Questionnaire 20 (SRQ-20)

One of the most commonly used scales in the context of mental health is the SRQ-20. This is a measure developed to document the intensity of non-psychotic psychiatric symptoms, and are particularly useful for epidemiological studies or clinical settings where a brief assessment is required⁶. The questionnaire consists of 20 binary questions (yes or no) where the patient must judge whether a symptom occurred in the last thirty days. A

representative study of the Brazilian population assessed the scale construct validity by examining its latent structure⁸. Their results suggest the 20 items of the SRQ-20 measure four psychological aspects: Depressed-Anxious Mood, Decrease of Vital Energy, Somatic Symptoms and Depressive Thoughts⁸. The authors also report a moderate to high internal consistency for the total score (0.80), but low or inadequate values for the subscales. Gonçalves and colleagues⁹ reported that the cut-off point 7/8 shows 86% sensitivity, 89% specificity 89%, 76% positive predictive value and 94% negative predictive value for the detection of mental disorders diagnosed by a clinical interview. These authors report internal consistency of 0.86 and found four latent traits in a principal component analysis. Santos and colleagues¹⁰ presented a detailed review of the instrument, including other psychometric studies.

Statistical analysis

We calculate the internal consistency of the SRQ-20 using the Kuder-Richardson method and test-retest reliability by the Intraclass correlation coefficient. The reliable clinical change index using guidelines proposed by Jacobson and Truax¹¹. We have established as a reliable change in values equal or larger than the corresponding 0.05 and 0.10 significance levels.

RESULTS

Table 1 shows the description of the participants. A significant number of participants showed clinical non-psychotic symptoms according to 7/8 cut-off score (31%). The internal consistency of the scale was high (0.86), so as the Intraclass correlation coefficient, which showed very similar reliability parameter (0.88, $p < 0.001$). An evidence of reliability. Adopting the standard deviation of the sample as a whole (4.49) the reliable change parameters, both by internal structure and test-retest estimates, rounded to the nearest integral value, are ± 4 at $p = 0.10$ and ± 5 at $p = 0.05$.

Table 1. Participant's description and SRQ-20 results
Sociodemographic data

Age (mean±SD)	27.5±9.2
Education (mean±SD)	13.6±3.4
Sex (female, %)	66%
SRQ-20	
Mean±SD	5.67±4.49
Percentile 5	1
Percentile 25	2
Percentile 50	5
Percentile 75	8
Percentile 95	14
Minimum	0
Maximum	19
Clinical symptoms (SRQ-20>7)	31%
Internal consistency	0.86
Test-retest stability (ICC)	0.88
Reliable change Index (p=0.10)	±4
Reliable change index (p=0.05)	±5

SRQ-20: Self-Reporting Questionnaire 20, ICC: Intraclass correlation coefficient.

DISCUSSION

In the present study, we analyzed SRQ-20 reliability and introduced a reliable change coefficient found. The values of values for internal consistency (0.86) and test-retest reliability (0.88) are close to those reported in other studies. Santos and colleagues⁸ reported internal consistency of 0.80 in a populational study (n=3190), relatively older (mean age 35 years) than our participants. Similar results were reported by the same author in a more recent research¹², using results from four different studies (n=9959), where the coefficients ranged from 0.82 to 0.85, participants usually older than ours. Other studies report a coefficient of 0.90 in a sample of 495 participants (mean age = 40 years)⁹. Contrasting our results with the Brazilian literature about SRQ-20, we found consistent evidence of reliability, where coefficients of internal consistency were superior to 0.80.

The reliable clinical change index is used as follows. Suppose a patient diagnosed with a major depressive episode scored 13 in SRQ-20 - this is the baseline for monitoring the patient. The clinical staff starts pharmacological treatment combined with cognitive-behavioral therapy, an efficient treatment for depression^{4,5}. After fifteen, thirty and forty-five days of treatment, the patient responds the SRQ-20. His results are, respectively, 15, 9, and 6. By calculating the difference between each treatment phase, we would have non-reliable change between baseline and the first evaluation ($15 - 13 = 2$, below the reliable clinical change index). However, there has been a significant clinical change between the baseline and the second evaluation at 0.10 but not at 0.05 ($9 - 13 = -4$). Finally, comparing baseline to last evaluation, there was reliable clinical change significant both at 0.10 and 0.05 ($6 - 13 = -7$). These results suggest that there is the very low probability that changes in SRQ-20 scores are related to measurement error. The changes are probably related to treatment or other non-measured factors. Clinicians and researchers who adopt the SRQ-20 can use the previous parameters to assess changes associated with treatment or other factors. We have also provided an online calculator to this purpose, available freely at www.labepneuro.com.

Our study has important limitations. The sample evaluated in this study is not representative of the Brazilian population. The SRQ-20, although it is a simple scale, easy to apply and with good psychometric properties in the Brazilian context, is not adequate for the characterization of more specific psychiatric symptoms or behaviours, and should be used combined with other measures for best results in clinical assessment.

CONCLUSION

We provided the parameters to calculate a reliable clinical index of SRQ-20. Differences between post-intervention and pre-intervention scores higher or lower than 4 points suggest reliable clinical change significant at $p=0.10$, and higher or lower than 5 points significant at $p=0.05$.

ACKNOWLEDGEMENT: we would like to thank all participants for their time and engagement in contributing to this research. We would also thank the psychology undergraduates Wanessa Gabrielli Augusto Oliveira and Aline Alves Ferreira for the collaboration with data collection.

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