Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS): a validation study in Italian population

Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS): uno studio di validazione nella popolazione italiana

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SUMMARY. Background. Although cognitive deficit in persons with schizophrenia is well documented, the assessment of the patient's perception of its own cognitive functioning is a relevant issue not adequately studied. Several evaluation tools have been elaborated, however none has been validated in Italian. The aim of the study is the validation of the Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS), a rating scale designed to measure subjective cognitive deficits complaints in persons with schizophrenia. **Method**. 146 persons meeting the DSM-5 diagnostic criteria for schizophrenia have been recruited. The SSTICS was translated in Italian in accordance with international standard methods. Subjects were also evaluated using the Positive and Negative Syndrome Scale (PANSS) and the Subjective Well-being under Neuroleptic scale (SWN). Cronbach's alpha coefficient was used to assess internal consistency. Constructs were examined using exploratory factor analysis (principal component with varimax rotation). The factorial model was then tested via confirmatory factor analysis. **Results**. The factorial analysis revealed a 4-factor structure, which is more parsimonious than those obtained in previous studies. Correlations between STICSS and the other rating scales were significant for several domains. **Conclusions**. The Italian version of the SSTICS showed good psychometric properties and is suitable to measure the patients' subjective perception of cognitive impairment. Subjective evaluation can integrate objective measures of cognitive performances, supporting a multidimensional model of functional impairment in schizophrenia.

KEY WORDS: schizophrenia, cognitive deficit, subjective evaluation of cognitive deficit, insight, psychosis.

RIASSUNTO. Introduzione. Sebbene il deficit cognitivo nelle persone con schizofrenia sia ben documentato, la valutazione della percezione del paziente delle proprie funzioni cognitive è un rilevante problema non adeguatamente studiato. Sono stati elaborati numerosi strumenti di valutazione, tuttavia nessuno di questi è stato validato in Italia. Obiettivo dello studio è la validazione della Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS), una scala di valutazione sviluppata per misurare l'espressione dei deficit cognitivi soggettivi nelle persone con schizofrenia. **Metodo**. Lo studio è stato eseguito su 146 persone con diagnosi di schizofrenia secondo i criteri del DSM-5. I soggetti sono stati valutati con la Positive and Negative Syndrome Scale (PANSS) e la Subjective Well-being under Neuroleptic scale (SWN). La consistenza interna è stata valutata con il coefficiente alpha di Cronbach. È stata utilizzata l'analisi fattoriale esplorativa (analisi delle componenti principali con rotazione varimax) per esaminare i costrutti. Il modello fattoriale è stato valutato con un'analisi fattoriale confirmatoria. **Risultati**. L'analisi fattoriale ha rivelato una struttura a 4 fattori, ché è più parsimoniosa di quelle ottenute nei precedenti studi. Le correlazioni tra STICSS e le altre scale di valutazione sono state significative per molti domini. **Conclusioni**. La versione italiana della SSTICS ha dimostrato buone proprietà psicometriche ed è adatta a misurare la percezione soggettiva delle alterazioni cognitive da parte del paziente. La valutazione soggettiva può integrare le misure oggettive delle prestazioni cognitive, supportando un modello multidimensionale delle alterazioni funzionali nella schizofrenia.

PAROLE CHIAVE: schizofrenia, deficit cognitivo, valutazione soggettiva del deficit cognitivo, insight, psicosi.

INTRODUCTION

It is well established that patients with Schizophrenia Spectrum Disorders have profound and disabling cognitive deficits[1,2]. Research supports the idea that neurocognitive impairment is a critical feature of the illness and is not simply the result of the symptoms or the current treatments of schizophrenia[3-5]. The fifth edition of DSM[6] includes cognition as a domain that needs to be evaluated by clinicians in the course of a diagnostic assessment. The areas of cognition that seem to

be the most affected in schizophrenia and related sub-clinical phenotypes are processing speed; sustained attention; working memory; verbal learning and memory; visual learning and memory; reasoning/executive functioning; verbal comprehension and social cognition[7-9]. Cognitive deficits affect daily functioning and contribute to chronic disability and unemployment more than positive or negative symptoms[10-14].

In recent years, research has focused on Self-Appraisals of Cognitive Deficits (SACD)[15,16]. Indeed, SACD, as measured by cognitive complaints, is informative about the patient's own psychological status[17], and quality of life[18,19], and is also a strong predictor of long-term symptomatic deterioration[3,20].

Although the clinical importance of assessing neurocognitive functioning in schizophrenia is well established, few instruments have been developed to address cognitive complaints expressed by the patients[21,22]. Although several instruments have been used to measure self-perceived cognitive functioning, only the Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS)[23] was designed to specifically measure subjective complaints regarding the cognitive deficits in schizophrenia. Using this measure, a significant correlation between SSTICS scores and objective data concerning memory and attention was found, suggesting that subjective complaints correspond to the actual cognitive deficits. Lecardeur et al.[24] demonstrated that the SSTICS is a good instrument for evaluating SACD in persons with schizophrenia and also revealed good concordance between cognitive impairments experienced by patients and objective cognitive deficits. To our knowledge, the SSTICS has not been validated in Italian. With this study, we aim at translating in Italian and validating the STICSS, as well as to assess SACD association with psychopathology.

METHODS

Participants

146 patients hospitalized for an index episode of schizophrenia at the Department of Mental Health in L'Aquila, Italy, were recruited. Inclusion criteria were a diagnosis of schizophrenia according to the DSM-5[6] and age between 18 and 65 years. Exclusion criteria were: any comorbid neurologic disorder; significant substance abuse in the past 6 months or lifetime history of substance dependence[25]; intellectual disability; any medical illness associated with neurocognitive impairment; current pregnancy or lactation and inability to provide an informed consent.

The institutional ethics committee approved all recruitment and assessment procedures. All patients provided a written informed consent after receiving a detailed explanation of the study. This study adheres to the Declaration of Helsinki. The privacy rights of all subjects were observed.

Patients were tested in a relatively symptomatic condition during the hospitalization. This condition allows a higher spread of distribution of the data with more possibilities to identify correlation between symptoms and insight.

Clinical assessment

The included measures were the Positive and Negative Syndrome Scale (PANSS), the Subjective Well-being under Neuroleptic scale (SWN) and the Italian version of the STICSS.

The PANSS[26] is a 30-item rating scale, specifically developed to assess patients with schizophrenia and is divided in three subscales, a Positive Scale with seven positive symptoms (P1-P7), a Negative Scale with seven negative symptoms (N1-N7) and a General Psychopathology Scale with 16 items (G1-G16). Sub-scale scores were shown to be independent of each other. We used the five-factor model proposed by Wallwork[27], including a total of 20 items: items P1, P3, P5, G9 (positive factor), items N1, N2, N3, N4, N6, G7 (negative factor), items P2, N5, G11 (disorganized/concrete, cognitive factor), items P4, P7, G8, G14 (excited factor) and items G2, G3, G6 (depressed factor). Items G 12 Lack of insight is not comprised in any Wallwork's factor.

Participants also undertook the (SWN-S)[28], a self-administered rating scale devoted to evaluating the psychological and physical well-being of patients treated with neuroleptics. For the purpose of the study the short version (20 items, including 5 subscales: mental functions, self-control, emotional control, social capability and physical functions) was used.

Italian adaptation of the SSTICS

The Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS)[23] was used as a measure of SACD. The questionnaire contains 21 items on a 5 point Likert scale focusing on: memory, attention, executive functions and praxia. The total score (range 0-84) is calculated as the sum of all items, with higher scores reflecting a greater SACD.

The SSTICS was adapted into Italian from the original English version following a precise translation protocol based on international standards[29].

First, the SSTICS was translated into Italian by two professional translators, and then a reconciled version was elaborated by an independent translator, who identified and resolved any possible inadequate expressions or discrepancies between the two forward translations. Then, a professional translator, different from the translators who performed the original English-to-Italian translation and with no knowledge of the English original scale, translated the reconciled version back into English. This back-translation was compared to the original version by a panel of experts to verify the equivalence of the two English versions in terms of meaning and conceptual content. The two versions resulted equivalent, thus the last Italian version of the SSTICS was considered final. The translated instrument was then pre-tested on 10 patients with Schizophrenia to assess their understanding of the questions. No major issues were found during the pre-testing phase, thus the final joint translation was carried out, named SSTICS Italian version.

Data analysis

Descriptive statistics and Cronbach's alpha for all SSTICS items were computed. Cronbach's alpha was calculated in order to assess the internal consistency reliability of the scale and its factors.

An Exploratory Factor Analysis (EFA) was conducted to identify the factor structure using principal components analysis with varimax rotation. The suitability of applying EFA was verified using Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's sphericity test, considering values >.70 for the KMO index and a significance of $p<0.05$ for Bartlett's sphericity test. Factor retention was according to Kaiser's criterion (i.e., retention for factors above eigenvalue 1).

Confirmatory Factor Analysis (CFA) using Analysis of Moment Structures (AMOS), Version 5.0 was then conducted. The CFA was used to confirm the exploratory model and determine the goodness of fit between a hypothesized model and the sample data.

The goodness-of-fit indices used to assess the degree of fit between the model and the sample were: Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR) and Root Mean Square error of approximation (RMSEA).

Relationships between SSTICS factors and total scores, and demographics and clinical variables have been investigated using bivariate correlations. Bonferroni correction was used to control for type I error due to multiple comparisons. The significance level for the correlations was therefore set at p<.01.

RESULTS

Of the 146 subjects initially recruited sample, data were obtained for 131. The participants had an average age of 40.83 (SD 11.25, range 19-65) and 81 (62%) were men. The mean education level (in years) was 12.01 (SD 3.73, range 5-18), mean age at onset was 26.10 (SD 8.73) and mean duration of the mental illness was 14.70 (SD 10.93).

The mean (SD) PANSS scores were: positive score 12.94 (4.28), range 4-23, negative score 13.99 (6.81), range 5-31; cognitive score 9.22 (3.43), range 3-19; excitement score 10.82 (5.06), range 4-24; depression score 6.98 (2.38), range 3-15; total score 85.61 (20.84), range 50-136. The score for Lack of insight was 4.15 (1.80), range 1-7.

The mean (SD) SWN scores along its five-subscales were: Mental functioning score 16.02 (6.73), range 0-24, Self-control score 15.78 (6.18), range 0-24; Emotional regulation score 16.16 (6.49), range 0-24; Social integration score 15.19 (6.41), range 0-24; Physical functions score 15.81 (6.87), range 0-24; total score 78.42 (31.76), range 0-118.

In table 1 SSTICS item and total scores are reported for the total sample and by gender. Females had higher scores on STICSS although for item 1 only the statistical significance was reached. Item 7, 11 and total scores showed a trend toward significance (p<0.1).

Cronbach's alpha on the 21 items was .911 with no items whose exclusion increased the overall reliability value. Exploratory factor analysis performed SSTICS items retaining for factors above eigenvalue 1 retrieved 5 factors, (Kaiser-Meyer-Olkin value of .87 and a Bartlett's Test of Sphericity of 1201.188, p<.0005) and explained 63.06% of the total variance. On the fifth factor loaded however only one item (Item 21), suggesting a more parsimonious factor extraction. As a matter of fact, the CFA supported a four factor solution yielding the best appropriate fit indexes: c^2=294, p<0.001; df=183, CFI=0.89; TLI=0.88, SRMR=0.064, RMSEA=0.068, 90% CI [0.053, 0.082] (Table 2).

Table 1. SSTICS item and total scores (mean ± SD) of study subjects.

Items	Total sample (n=131)	Males (n=81)	Females (n=50)	t
1	1.53±1.20	1.33±1.07	1.86±1.34	2.35**
2	1.52±1.39	1.26±1.05	1.52±1.33	1.18
3	1.47±1.21	1.36±1.09	1.66±1.38	1.32
4	1.06±1.28	1.05±1.29	1.08±1.27	.13
5	.60±.95	.54±.92	.68±1.00	.79
6	.64±.93	.60±.89	.70±.99	.57
7	1.31±1.25	1.17±1.22	1.54±1.26	1.63*
8	.90±1.21	.81±1.14	1.04±1.32	1.03
9	.52±1.05	.44±.92	.64±1.22	.97
10	.90±1.27	.81±1.14	1.04±1.46	.93
11	1.56±1.28	1.41±1.18	1.82±1.39	1.81*
12	1.54±1.21	1.47±1.10	1.66±1.38	.83
13	.92±1.18	.79±1.07	1.12±1.33	1.48
14	1.14±1.10	1.02±1.09	1.32±1.10	1.50
15	1.46±1.35	1.31±1.24	1.70±1.49	1.55
16	1.53±1.29	1.43±1.16	1.68±1.47	1.01
17	1.09±1.29	.99±1.17	1.26±1.45	1.12
18	1.05±1.18	1.01±1.10	1.10±1.30	.41
19	1.14±1.12	1.17±1.16	1.08±1.07	.46
20	1.08±1.20	1.04±1.09	1.14±1.37	.45
21	.55±1.01	.46±.92	.70±1.13	1.34
Total score	23.34±14.91	21.49±12.68	26.34±17.68	1.68*

Male/Female differences
* p<.10; ** p<.05

Table 2. Fit indices for the two, three, four and five factors models of the SSTICS.

Factors	X^2	df	CFI	SRMR	RMSEA	Hi_{90}	Low_{90}
2	391	188	0.812	0.076	0.098	0.103	0.078
3	354	186	0.844	0.071	0.083	0.096	0.069
4	294	183	0.897	0.064	0.068	0.082	0.053
5	303	179	0.885	0.065	0.072	0.086	0.058

df= degrees of freedom; CFI= comparative fit index; SRMR= standardized root mean square residual; RMSEA= point estimate of Steiger's root mean square error of approximation; HI90 and LO90= upper and lower ends of the 90% confidence interval of the RMSEA.

The Varimax rotated pattern matrix of the four factors solution is presented in Table 3. The first factor loaded items regarding attention and retention of general information and was therefore labelled "Attention and memory of information" (AMI factor). The second factor was labelled "Daily living cognition" (DLC factor) as item loadings were indicative of cognitive impairment involved in common daily activities. The third factor, labelled "Memory" (MEM factor) and the fourth factor encompassed items for memory performances with those loadings on the fourth factor specific for medical issues, so this factor was considered indicative of "Medical memory" (MM factor). Cronbach's Alpha for the four factors was .846, .842, .768 and .737 respectively.

SSTICS total score and its factors, but MM, positively correlated with age (total score r=.26, p<.005; AMI r=.22, p<.01; DLC r=.20, p<.05; MEM r=.27, p<.0005) and duration of illness (total score r=.30, p<.005; AMI r=.30, p<.005; DLC r=.23, p<.01; MEM r=.27, p<.0005). Educational level negatively correlated with the AMI factor (r=-.18, p<.05).

Correlations of the SSTICS four factors and total scores with PANSS and SWN subscales are reported in Tables 4. Correlation with PANSS factors are somewhat low. The highest correlations are negative with Lack of Insight (Total score, AMI and MEM: i.e. higher complaints – better insight). At the contrary positive are correlations with PANSS depression score (Total score, AMI and DLC: i.e. higher complaints – more severe depression). Positive symptoms negatively correlated with AMI (r=.21, p<.01), negative symptoms positively instead with DLC (r=.29, p<.005). Three SSTICS factors (i.e. AMI, DLC and MEM) and the total score show strong correlations with the SWN scales (see Table 4). The correlations, as expected, are negative since high scores on the SWN represent better functioning while high ratings on the SSTICS represent more subjective cognitive deficit complaints. The SSTICS MM factor score showed instead weak correlation coefficients with SWN subscales with the only significant correlation being with the SWN Mental functioning at .05 p level, not significant after Bonferroni correction.

DISCUSSION

In this study, we translated and validated an Italian version of the SSTICS. Our Italian version shows high internal consistency and offers a practical response to the need of a valid standardized evaluation of self-perceived cognitive impairment in persons with Schizophrenia Spectrum Disorders.

Although with some differences, our results are in agreement with most of the available literature.

In our sample, females showed higher scores than males, although the statistical significance was reached for item 1 only, with item 7, 11 and total scores showing a trend towards significance. This finding is not new in literature: Cuesta et al.[30] found female patients having higher complaint scores on Frankfurt Complaint Questionnaire (FCQ). It is noteworthy that females are generally underrepresented in most studies, increasing the probability of a type II error[31].

In our version, internal consistency had the highest value of Cronbach alpha till now observed for SSTICS.

Based on EFA and CFA results, we propose a 4-factor model for the Italian version of the STICSS. Our model is more parsimonious than previous reports in the literature. In the original study, using EFA, the authors proposed a 6-factor structure, accounting for a cumulative 60% of the variance[23], while further analysis by the same group found a 5-factor structure accounting for a slightly lower proportion of variance explained[32]. Our 4-factor structure accounts for a slightly higher percentage of variance explained (63.06% of the total variance). This confirmatory analysis allowed to refine the model originated by a technique with exploratory purposes leading to identify the latent variables[33,34].

The first factor has been labelled "Attention and memory of information". As a matter of facts the item loading on this factor regard attention and retention both of current and general information, comprehensive of "semantic memory", "attention", "distractibility", "alertness", "selective attention", "divided attention" and "sustained attention" as proposed by authors of the scale. In this regard, this factor is quite close to that derived from the initially formulated questions based on theoretical cognitive model formulated by Stip[23].

We labelled the second factor as 'Daily living cognition', including items mostly loading on the "Executive functions" factor found in Potvin et al.[35], adding an item included in the 'Daily life' factor found in Stip et al.[23]. We preferred the "daily living cognition" label as it sounds closer to the subjective perspective than the previous "executive functions". A similar factor that included the same items has been found in a EFA of a scale inspired to the SSTICS, validated in Arabic language[22].

We labelled the third factor 'Memory', consistently with part of the first factor found by Potvin et al.[35], and with the initial question formulation by Stip et al.[23] on memory components.

We labelled the fourth factor "Medical memory", which is identical to that of Potvin et al.[36].

Table 3. Principal component exploratory factor analysis. Rotation Varimax with Kaiser Normalization of the SSTICS (n. 131): extraction of 4 factors.

		Factors			
Item n°		1	2	3	4
16	trouble focusing attention for more than 20 minutes	.777			
12	absent-minded or up in the clouds	.736			
10	difficulty remembering names of well-known people	.608			
11	remembering national capitals. dates in history	.603			
15	unable to do two things at once	.591			
7	remembering information read in the newspapers, TV	587		.382	
13	difficulty being on alert or reacting to situations	.572	.469		.303
14	difficulty making out when presented with bits of information simultaneously	.517			
18	difficulty coordinating movements and actions		.771		
21	difficulty getting dressed or eating		.687		.331
8	difficulty doing household chores or repairs		.684	.399	
9	difficulty remembering hospital or outpatient clinic		.652	.415	
17	difficulty planning out activities		.647	.358	
19	difficulty changing movements, decisions		.583		
20	difficulty finding words, forming sentences	.334	.400		.364
3	difficulty memorizing things	.353		.746	
2	difficulty remembering information freshly received			.681	
4	difficulty remembering medication names			.571	.382
1	difficulty remembering things	.520		.558	
6	forget take, medication				.765
5	forget things. doctor's appointment				.756
% variance explained		36.52	8.03	6.94	6.45
Cronbach's Alphas		.846	.842	.768	.737
Mea±SD (n=131)		10.36±6.90	6.32±5.79	5.43±3.73	1.24±1.67
Loadings less than .30 have been omitted.					

We observed a complex pattern of correlations between several SSTICS and PANSS factors, while no significant correlation between the two total scores emerged. In line with previous reports, these correlations are weak (r<.3).

The most relevant correlations were between PANSS Negative and STICSS "Daily Living Cognition", between PANSS Depression and SSTICS total score, "Attention and memory of information", "Daily living cognition", and "Memory", and finally a reverse correlation between PANSS "Insight" item and STICSS total score and "Memory". These finding are consistent with several previous observations showing an association between SACD and depressed symptoms[15,19,32,37,38], although with some contrasting reports[39].

Although speculatively, given the literature observation of symptoms gender differences with females generally displaying more affective symptoms than males with more negative[40], the correlation between SSTICS scores and PANSS

Table 4. Correlations between SSTICS factors. and Positive and Negative Syndrome Scale (PANSS) scores and Subjective Well-being under Neuroleptic scale (SWN) (n=131).

	STICSS				
	Total score	**Attention and memory of information**	**Daily living cognition**	**Memory**	**'Medical' memory**
PANSS					
Positive	-.15	-.21**	-.05	-.15	.03
Negative	.20*	.17	.29***	.04	.02
Cognitive	.03	.02	.04	.03	-.05
Excitement	-.20*	-.18*	-.20*	-.16*	-.00
Depression	.23**	.27***	.20*	.11	-.00
Lack of Insight	-.20**	-.31§	-.16	-.27***	-.17
Total score	-.00	-.04	.10	-.09	-.01
SWN					
Mental functions	-.41§	-.31***	-.37§	-.38§	-.25*
Self-control	-.34***	-.26*	-.30***	-.34***	-.09
Emotional control	-.35***	-.30***	-.25*	-.35***	-.20
Social capability	-.38§	-.28**	-.34***	-.39§	-.15
Physical functions	-.36***	-.27*	-.32***	-.37§	-.17
Total score	-.42§	-.32***	-.35***	-.43§	-.19

Bonferroni correction: the significance level for the correlations has been set at p< .01.
* p<.05; ** p<.01; *** p<.005; § p<.0005 (2-tailed).

depressive factor we report can be coherent with the higher cognitive complaint scores observed in females.

Lack of insight (LoI) also correlated with SSTICS total score, as well as with attention and memory factors. This observation is in line with several studies[23,32,37], although others failed to replicate this finding (for a review[31]). Several reports focusing on the relationship between SACD and LoI support a relationship between insight and neurocognitive, social-cognitive and meta-cognitive abilities[41,42]. In this framework, LoI can be hypothesized as mediator in the relationship between SSTICS and depressive symptoms, enhancing a condition of "Insight paradox", in which the persons with higher level of insight has an increased probability of having more severe depressive symptoms[16,37,43].

Significant correlations in our sample suggest that positive symptoms are associated with fewer cognitive complaints for "attention and memory of information", while negative symptoms are associated with higher "daily living cognition" complaints. These results are coherent with previous studies[23,24] reporting similar correlations between SSTICS and PANSS scores. These correlations were instead observed in opposite direction in other studies[38,44]. Shin et al.[19] found positive correlations with both positive and negative symptoms.

SACD is a critical aspect in schizophrenia, as an accurate appraisal of one's own cognitive deficit is a prerequisite for implementing appropriate coping strategies, including compliance to prescribed medications and interventions[15,38]. In the present study, we used SWN scale, a widely used device measuring well-being during antipsychotic treatment[28,45], with the aim to investigate the possible association between these subjective evaluations of cognitive complaints and well-being.

The results show a relevant negative correlation between SSTICS and SWN factors. In particular, three SSTICS factors, "Attention and memory of information", "Daily living cognition", "Memory" and SWN total score significantly correlated. These results suggest that patients who report a better psychological and physical well-being have fewer subjective cognitive complaints. However, counter-intuitively, only a trend towards significance in the correlation between SSTICS "Medical memory" and SWN mental functioning was observed.

Therefore, our study confirms the importance of subjective evaluations. In other words, the subjective evaluation of cognitive deficits as well as the psychological and physical well-being of patients are associated with the patient's psychological and clinical status[17], and quality of life[3,18,19,28,46].

In this study, we observed differences between the original constructs, based on cognitive neuropsychology models, and the factors obtained by factorial analyses; this condition has been also evidenced in the first validation study[23]. This is likely due to the different perspective, one closer to patient

view and personal condition prevailing in the validations conceptual constructs, and the other one related to neuropsychological concepts. These observations are common to other studies investigating the patient/client perspective versus the clinical/objective one[47,48]. It is also likely that this different perspective could partly explain the weak correlation coefficients between subjective complaint and clinical PANSS evaluation, as well as the higher coefficients with self-reported information by SWN.

Limitations

This study presents a number of limitations. Firstly, it lacks an objective measure of cognition that could have allowed a correlational analysis between SACD and objective cognitive deficits. However, such insights were considered beyond the scope of this study, thus objective cognitive functioning was not included in the assessment. Secondly, CFA was performed on the same sample as of the EFA. Generally, EFA and CFA should be performed on separate samples or on two distinct sub-samples from the same sample. However, given the relatively small sample size, splitting the sample in two halves would have result in a small sample size that could have hampered statistical power.

CONCLUSIONS

This is the first study validating the Italian version of the STICSS. Given its psychometric properties, conciseness and little effort required for both clinicians and patients, STICSS is an instrument with a good level of acceptance that could be easily included both in standard clinical setting and research protocols. SACD represents an important emerging aspect for patients with Schizophrenia Spectrum Disorders, as well as subclinical phenotypes[9], and its evaluation should take part in clinical routine, especially when assessing patients' disability and when designing individualized recovery-oriented interventions. STICSS is therefore suitable for implementation in Community Mental Health Services as well as second-level clinical settings. SACD represents an important research variable that could help explaining a number of adverse functional outcomes in Schizophrenia Spectrum Disorders. STICSS could help efficiently introducing SACD evaluation in large epidemiological studies as well as experimental studies with small resource and time-consumption.

SC made substantial contributions to study design, analyses, and interpretation of results; was involved in manuscript drafting and revision.
VS made substantial contributions to study design, data acquisition, analyses, and interpretation of results; was involved in manuscript drafting and revision.
FP made substantial contributions to study design, analyses, and interpretation of results; was involved in manuscript drafting and revision.
GDL made substantial contributions to data acquisition and was involved in manuscript drafting and revision.
AR made substantial contributions to data acquisition and was involved in manuscript drafting and revision.
All authors have read and approved the manuscript.

Conflict of interests: the authors have no conflict of interests to declare.

Funding: the research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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