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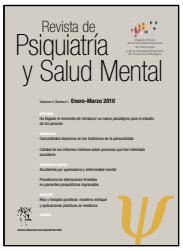

ORIGINAL ARTICLE

# Cognitive Complaints in Schizophrenia: Relationship With Insight and Other Cognitive Measures

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**KEYWORDS**
Cognitive impairment;
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**Abstract**
*Introduction:* Individuals diagnosed with schizophrenia have significant cognitive deficits. However, the subjective perception of these deficits do not always coincide with the neuropsychological test and clinical ratings.
*Methodology:* This study evaluates the cognitive performance of 46 outpatients with schizophrenia, in a Psychosocial Rehabilitation Program, by three different measures: neuropsychological tests (objective assessment), cognitive factor of PANSS (clinical ratings), and subjective scale of cognition, SSTICS (patient self-report). It also studies the possible relationship between subjective assessment of cognitive symptoms and insight of the mental disorder (SUMD).
*Results:* SSTICS total score correlated only with some neuropsychological subtest, but not with cognitive factor of PANSS. The clinical ratings is more consistent with neuropsychological test than the cognitive complaints. No relationship between SUMD and SSTICS.
*Conclusions:* Because of the lack of correspondence among several measures, it is possible to think that different cognitive areas have been evaluated. It is therefore important to consider all assessment options in order to create cognitive rehabilitation programs. Cognitive complaints seems to be an independent variable of insight.


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**PALABRAS CLAVE**
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**Percepción subjetiva de déficit cognitivos en esquizofrenia: su relación con *insight* y otras medidas cognitivas**

**Resumen**
*Introducción:* La mayoría de las personas diagnosticadas de esquizofrenia presentan déficit cognitivos. No obstante, la percepción subjetiva de esos déficit no siempre coincide con la evaluación neuropsicológica ni con la evaluación clínica de aquéllos.
*Metodología:* En este trabajo se evaluó el rendimiento cognitivo de 46 pacientes con esquizofrenia que acuden a un centro de rehabilitación psicosocial, mediante tres pruebas diferentes: una batería neuropsicológica, el test Barcelona (evaluación objetiva), una escala de síntomas cognitivos, el factor cognitivo de la PANSS (evaluación clínica) y una escala subjetiva de cognición, la SSTICS (autoevaluación del paciente). También se estudiaron las relaciones entre la percepción subjetiva de síntomas cognitivos y el *insight* de la enfermedad, evaluado mediante la SUMD.
*Resultados:* La puntuación total de la SSTICS se correlacionó sólo con algunos de los subtests del Barcelona, pero no con el factor cognitivo de la PANSS. La evaluación clínica se corresponde con los tests neuropsicológicos en mayor medida que con la percepción subjetiva. No hay relaciones entre la percepción sujetiva de los déficit cognitivos y el *insight*.
*Conclusiones:* Dada la falta de correspondencia entre las diferentes medidas, se plantea si podrían estar evaluando ámbitos diferentes del deterioro cognitivo. Se valora la importancia de considerar todas las opciones de evaluación con vistas a elaborar programas de rehabilitación cognitiva. La percepción de déficit cognitivos parece ser independiente del *insight*.


## Introduction

People diagnosed with schizophrenia show deterioration in cognitive function, mainly in the areas of attention, memory, processing speed and executive functions.[1] Some studies have found that this deterioration affect 98% of patients,[2] which means it is even considered as a diagnostic criteria for schizophrenia.[3,4] Furthermore, cognitive deterioration is one of the main predictors of psychosocial function,[5-7] and seems to have significant influence on treatment relevant variables, such as insight [8] and coping strategies.[9]

Currently there are many standardised tests and neuropsychological batteries that objectively assess the functioning of different cognitive areas. There are also scales assess the degree of deterioration in patients, based on clinical criteria. However, assessments carried out by one method or another do not always coincide. Although Bell et al[10] found correlations between different cognitive tests and the cognitive factor of the Positive and Negative Syndrome Scale (PANSS),[11] later studies, such as those of Harvey et al[12] and Hofer et al,[13] both using PANSS, concluded that, given the very scarce correlation between both measurements, clinical assessment did not match the objective assessment and, therefore, can not be substituted for the measurements determined by means of tests. Furthermore, Moritz et al,[14] evaluated attention and memory using both methods, and found some correlation, mainly in the evaluation of memory; however, when subsequently classifying patients as deteriorated and non-deteriorated, they found large discrepancies, with a lack of correlation between the two measurements in more than half the cases.

Another study area that is recently being developed is the evaluation of cognitive deficits based on subjective assessments by patients on their own deficits. Patient rehabilitation is considered an important aspect to keep in mind, since subjective perception of cognitive symptoms is a variable related to quality of life[15] and predicts symptomatic deterioration.[16] During recent years several different scales have been used for this. However, it is not clear if these subjective measurements can be related to clinical assessments and the results of neuropsychological tests and, therefore, if they contribute a realistic vision of real cognitive functions in patients.

To evaluate this issue, different studies have analysed the relationship between patients' perception and objective measurements and clinical assessment. Medalia et al[17] found that patients' assessment of their own deficit was not a valid indicator of their neuropsychological alterations (evaluated by means of tests), and although clinical assessments were more suitable, they were not good indicators either. Clinical assessment, however, correlated, although only moderately, with subjective patient assessment. Moritz et al[14] found that subjective assessment does not coincide with objective tests nor with clinical assessment. Other authors have found the same lack of correlation between patients' self-assessment and objective test results, such as Marková,[18] as well as Chan et al[19] on memory evaluation, Janelle et al[20] on executive function assessment and

Van der Bosch et al[21] on attention assessment. In contrast to this data, Prouteau et al[22] found some correlations, although moderate, between different objective measurements of cognitive function and patients' subjective perception. Schultze-Lutter et al[23] had more specific results, since they were only able to determine this relationship during the prodromic stages of the disease, when cognitive functions are less affected.

Finally, Lecardeur et al[24] also found correlation between cognitive deterioration determined using Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS)[25] in patients and, in this case, clinical assessment (using the Positive and Negative Syndrome Scale cognitive factor (PANSS)). These results used the same tools, but do not coincide with those of Bayard et al.[26]

Despite finding little correlation between objective and subjective cognitive deficit Lee,[27] did find that neuropsychological tests, such as visual memory, together with variables such as anxiety and depression, predict the patients' perception of their cognitive function. Given the disparity of results, however, he considers that maybe objective and subjective cognitive deficits are in reality two different constructs.

The different results obtained do not allow us to reach clear conclusions, although we are able to determine that that there is a lack of correspondence between the different cognitive measurements.[14]

For some authors, these results are coherent with the fact that people with schizophrenia have problems related to awareness of their disease or insight.[14] Whereas, subjective perception measurements of cognitive function, compared with other assessments, either taken from objective tests, clinical assessments or even the relatives or carers' opinions,[18,28] could represent measurements on an insight specific to this type of deficit.

Although most studies on insight use a multidimensional perspective,[29] which includes aspects such as awareness of suffering from a disease, its symptoms, and the attribution of the symptoms to the condition. Psychotic symptoms are assessed when evaluating awareness of symptoms, but on fewer occasions the objective is to assess awareness characteristic of the symptoms or cognitive alterations. However, being aware of some aspects of the disease does not necessarily mean being aware of others, and it is not clear whether persons with schizophrenia have specific insight of their cognitive deficiencies.[17]

The relationship between subjective perception of cognitive deficits and insight of other aspects of the disease has yet to be determined. Lecardeur et al[24] found no relationship between subjective perception assessed by means of SSTICS and a general measurement of insight (PANSS item 12). These results do not agree with the findings of Stip et al[25] using the same tools. In a similar study, also using the SSTICS scale, but carrying out a multidimensional assessment of insight using the Scale to Assess Unawareness of Mental Disorder (SUMD),[26] a relationship was only found between total SSTICS score and the SUMD medication factor.

The general objectives of this study are: *a)* to assess the correspondence between objective assessment of cognitive performance and assessment by the clinician; *b)* to assess existent discrepancies between subjective perception of a deficit and assessed cognitive performance both with clinical and objective measurements; *c)* to determine the predictive value that objective tests and clinical assessments may have on subjective ones, and *d)* to study the relationship between subjective perception and insight. Finally, we review the role of sociodemographic variables in the subjective perception of cognitive deficit.

## Materials and Methods

The sample is 46 patients who come in to the psychosocial rehabilitation centre at the Centro Hospitalario Padre Menni de Santander and have been diagnosed with schizophrenia according to ICD-10 criteria by the psychiatrist of reference in the mental health public network. At the time of this study, all the patients were taking antipsychotic medication. The sample characteristics can be seen in table 1.

**Table 1** Sociodemographic Characteristics of the Sample

| | |
|---|---|
| Patients | 46 |
| Age (years) | |
| <25 | 3 (6.5) |
| 25-35 | 19 (41.3) |
| 36-45 | 13 (28.2) |
| >45 | 11 (23.9) |
| Sex | |
| Men | 33 (71.7) |
| Women | 13 (28.3) |
| Marital status | |
| Single | 40 (86.4) |
| Married | 4 (9.1) |
| Separated/ divorced | 2 (4.5) |
| Education | |
| Incomplete | 7 (14.6) |
| Basic/ primary | 19 (41.5) |
| Secondary | 18 (39) |
| University | 2 (4.8) |
| Age of onset (years) | |
| <25 | 27 (59.3) |
| >25 | 19 (40.7) |
| Type of schizophrenia | |
| Paranoid (F20.0) | 26 (56.5) |
| Hebephrenic (F20.1) | 3 (6.5) |
| Non-differentiated (F20.3) | 2 (4.3) |
| Residual (F20.5) | 12 (26.1) |
| Simple (F20.6) | 1 (2.2) |
| Other (F20.8) | 2 (4.4) |
| Number of admissions | |
| 0 | 10 (21.7) |
| 1 | 9 (19.6) |
| 2 | 10 (21.7) |
| 3 | 4 (8.7) |
| 4 | 8 (17.4) |
| 5 or more | 5 (10.9) |

Mean duration of the disease: 12.83±8.29 years.
Data are expressed in n (%)

Subjective assessment of psychotic symptoms was performed using SSTICS.[25] In its Spanish translation and adaptation,[30] there are 21 items on cognitive complaints that arise in the context of daily events. The different STICS items are divided into five factors that refer to difficulties related to executive function, memory, awareness of effort, daily living, distraction and vigilance.

Furthermore, the total score of the scale is achieved.

For clinical assessment of cognitive deficits the Spanish adaptation of PANSS was used.[31] It is one of the most used instruments to assess symptoms of patients with schizophrenia. It is a heteroapplied scale, which is completed based on a semi-structured interview. In its original version, PANSS had 30 items grouped in three factors. Subsequent studies propose a model with five or more factors. In this study we used a model proposed by Gil et al[32] with six factors (disorganisation, excitation, anxiety/depression, cognitive, positive and negative) in which the cognitive factor contains the following items: Difficulty in abstract thinking (N5), disorientation (G10) and poor attention (G11).

Assessment of neuropsychological deficits was performed using the Integrated Program for Neuropsychological Exploration Test of Barcelona, created by Peña-Casanova.[33] The following subtests were chosen as the ones most related to cognitive deterioration in schizophrenia: Passwords, direct digits, inverse digits, verbal memory (immediate), visual memory (immediate), categorical evocation, verbal abstraction (comprehension) and cubes; as measurements of attention, operative memory, visual and verbal memory, executive function and verbal and non-verbal reasoning, respectively.

Insight capacity was assessed using the Spanish adaptation[34] of the SUMD.[35] This is a standardised scale based on a semistructured interview that makes it possible to assess awareness of mental disorder with reference to five different dimensions: awareness of mental disorder, awareness of the effects of medication, awareness of the consequences of the disorder and the symptoms and attribution of those symptoms to mental disorder.

### Statistical Analysis

Pearson's correlation was used to assess the relationship between the Barcelona test score and the PANSS cognitive factor, as well as the relationship of each of them with subjective perception of deficits (SSTICS) and we used linear regression to study the predictive value which both could have on the SSTICS results.

To study the relationship between subjective perception and insight, we used the Student t test, categorising the SUMD score (1-2: awareness of disorder; 3-5: no awareness), and using total score and the score of the different SSTICS factors as continuous variables.

To study the relationship between subjective perception and sociodemographic variables, we used Pearson's correlation.

Statistical analyses were performed using SPSS software version 13.0 for Windows.[36]

## Results

The PANSS cognitive factor (clinician's assessment) correlated with most Barcelona subtests (objective assessment), except for visual memory and key numbers. With regards the SSTICS, both the daily living factor and total score correlated with attention and executive function of the Barcelona test. Only the daily living factor, but not the total score, correlated with the PANSS cognitive factor. Results can be seen in table 2.

Linear regression, using the SSTICS score as dependent variables, showed a significant relationship between the group of Barcelona subtests and SSTICS daily living factor ($r=0.612$; $F=2.769$; $P<0.05$), which explains 37.4% of variance. The PANSS cognitive factor, which also showed a significant relationship with the SSTICS daily living factor ($r=0.374$; $F=6.995$; $P<0.05$), with 14%variance.

With regards the relationship between insight and subjective perception of cognitive deterioration, no sig-

**Table 2** Pearson Correlations between PANSS Cognitive Factor, Barcelona Test Score and SSTICS Total Score

| | Dd | Id | Pwords | Tm | Vm | Ac | Kn | C | PANSS Cognitive factor |
|---|---|---|---|---|---|---|---|---|---|
| PANSS Cognitive factor | −0.43[a] | −0.421[a] | −0.473[a] | −0.379[b] | −0.179 | −0.53[a] | −0.271 | −0.351[b] | — |
| SSTICS factors | | | | | | | | | |
| Executive function | −0.329[b] | −0.144 | −0.197 | −0.149 | −0.043 | −0.151 | −0.159 | −0.116 | 0.025 |
| Memory | −0.178 | −0.298[b] | −0.059 | −0.305[b] | −0.313[b] | −0.275 | −0.239 | −0.199 | 0.254 |
| Awareness of effort | −0.243 | −0.124 | −0.212 | −0.111 | −0.069 | −0.173 | −0.178 | −0.009 | 0.077 |
| Daily living | −0.39[a] | −0.414[a] | −0.424[a] | −0.148 | −0.193 | −0.164 | −0.423[a] | −0.197 | 0.386[a] |
| Distraction | −0.281 | −0.218 | −0.203 | −0.169 | −0.193 | −0.193 | −0.409[a] | −0.177 | −0.018 |
| Vigilance | −0.34[b] | −0.179 | −0.337[b] | −0.011 | −0.076 | −0.302 | −0.213 | −0.198 | 0.049 |
| SSTICS total score | −0.385[a] | −0.281 | −0.325[b] | −0.173 | −0.175 | −0.279 | −0.346[b] | 0.147 | 0.14 |

Ac: Abstraction–comprehension; C: Cubes; Dd: Direct digits; Id: Inverse digits; Kn: Key numbers; Pwords: 'P' words.Tm: Text memory; Vm: Visual memory.

[a]$p<0.01$.

[b]$p<0.05$.

nificant relationship was found between SUMD and SSTICS results, except for general awareness of disease, which was related to the SSTICS daily living factor (t=-1.628; F=7.354; $P<0.05$).

Finally, the relationships between the results of subjective perception of cognitive deficits and sociodemographic factors were the following: Age at disease onset correlated with two SSTICS factors: vigilance (r=-0.402; $P<0.05$) and distraction (r=-0.314; $P<0.05$), and years of evolution correlated with vigilance (r=0.425; $P<0.01$).

## Discussion

The results showed significant correlations, although moderate ones, between objective assessment and clinical assessment in attention, verbal memory, executive function and verbal and non-verbal reasoning tests. Similar results were found by Bell et al[10] for attention and executive function and by Moritz et al[14] for memory; although in both cases assessment tests were different to those in this study, which makes it difficult to compare results, and would therefore require further confirmation. However, the data obtained indicates that the tool used for clinical assessment, the PANSS cognitive factor, can be a valid instrument to assess cognitive deficits in schizophrenia. Anyway, it is advisable to carry out a wider assessment based on neuropsychological tests, since the objective tests are the ones which are better related to and show a greater predictive value for patients' subjective perception, maybe because they contribute an assessment of more cognitive areas.

Results also indicate that at least to a certain extent the patients are aware of many of their cognitive problems, even when they are not aware of other aspects of the illness. This supports the usefulness of a dimensional assessment of insight, given that the mechanisms that operate in the perception of one or other of the problems may not be the same; in fact, it may be easier to accept, for example, that there are memory difficulties, which are easier to manage with compensatory strategies, than to acknowledge other aspects of the disease such as delirium or hallucinations.

The fact that, more than the other SSTICS factors, it is daily living that has a greater relationship with the other cognitive measurements is indicating that maybe the items that form part of this factor are those of greater ecological validity. Therefore, they are easier to detect by patients and correspond most to the test measurements. In this sense, Keefe et al[37] advocate that tools used to assess subjective deficit should focus on specific problems for facilitating precise answers related to the real difficulties encountered by patients during daily living activities. Furthermore, it is necessary to have a certain capacity of awareness of a disorder to recognise these daily difficulties, which is shown by the fact that this factor correlates with the more general item of SUMD.

In any case, it seems important to consider all options (objective measurements, clinical criteria and patients' complaints) with a view to drawing up cognitive rehabilitation programmes. The effort to assess how the detected cognitive deficits influence patients' daily living activities and to adjust rehabilitation programs to their complaints and daily experience could by indispensable to achieve adherence to said programmes and a real improvement in patients' welfare.

As to sociodemographic factors, it would seem that more deficits are perceived the earlier the onset of the disorder and the longer the years of evolution of the disease. These results are also seen in other studies.[26]

It is important to highlight that this study does not solve the problem of the lack of correspondence between different measurements, which continues to be an unresolved aspect in this type of studies. This means that, as was shown by Zanello et al,[20] attention and executive function problems are seen by the patient as memory problems, and the lack of correspondence between theoretical constructs underpinning the different measurements and that, in the case of certain tests, we are not assessing a specific function, but superimposed cognitive domains, which makes interpretation difficult. On the other hand, there are many individual differences related to environment demands, which can change the perception of cognitive problems. In this respect, Lecardeur et al[24] considered that maybe cognitive complaints are not so much associated with patients' cognitive deficits as with their perception of functional difficulties or lack of strategies to resolve these difficulties. It would be interesting, therefore, to also analyse the relationship between patients' subjective complaints and their problem-solving and emotional capacities in future studies.

Since these are patients that come in to a psychosocial rehabilitation centre, the results obtained are not applicable in a general manner to all patients with schizophrenia. This only means that the results obtained must be analysed in-depth and with caution.

It would be important, in future research, and independent of the cognitive assessment tools used, to study other variables, as well as sociodemographic data, which could be involved in subjective perception of deterioration, such as pharmacological treatment, symptoms, environment variables, among others; as also to continue researching, due to their clinical relevance, the possible relationship between subjective perception of cognitive symptoms and perception of other symptoms of this disease.

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