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Spanish Validation of the MAP-SR: Two Heads Better Than One for the Assessment of Negative Symptoms of Schizophrenia

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Abstract

Background: There is little research on self-reported negative symptomatology measures in schizophrenia. The aims of this study were to validate the Spanish version of the Motivation and Pleasure Scale-Self-Report (MAP-SR) and determine the concordance between patient-reported outcome measures for reflecting the severity of negative symptoms of schizophrenia and clinician-rated outcome measures. **Method:** A sample of 174 subjects who completed the MAP-SR and 104 who completed the Self-Evaluation of Negative Symptoms (SNS) were analyzed. The clinician-reported outcome measures (CROMs) were the Spanish versions of the Clinical Assessment Interview for Negative Symptoms (CAINS) and the Positive and Negative Syndrome Scale (PANSS), while the patient-reported outcome measures (PROMs) were MAP-SR and SNS. Cronbach's a, bivariate analyses and Lin's concordance correlation coefficient (CCC) were calculated. **Results:** The Spanish version of the MAP-SR demonstrated excellent reliability (Cronbach's α=.923). Its correlation coefficients were higher with CAINS [CAINS-Total: r=.608, p<.005; CAINS-Motivation and Pleasure subscale(CAINS-MAP): r=.662, p<.005] than with PANSS negative scales [PANSS-Negative scale(PANSS-N): r=.393, p<.005; PANSS-Marder Negative Factor(PANSS-MNF): r=.478, p<.005]. Finally, concordance between clinician and patient ratings was low in all cases, varying from a CCC of 0.661 to .392. **Conclusions:** We found poor concordance between patient and clinician ratings, hence we believe that the two evaluations are not mutually exclusive but complementary.

Keywords: Schizophrenia; negative symptoms; assessment; self-report; MAP.

Resumen

Validación Española de la MAP-SR: Dos Perspectivas Mejor que Una en la Evaluación de los Síntomas Negativos de la Esquizofrenia. **Antecedentes:** existe poca investigación sobre autoinformes de evaluación de la sintomatología negativa en esquizofrenia. Los objetivos de este estudio son validar la versión española de la Escala-Autoinforme de Motivación y Placer (MAP-SR) y determinar la concordancia entre pruebas autoaplicadas y heteroaplicadas para los síntomas negativos de la esquizofrenia. **Método:** se analizaron los datos de una muestra de 174 personas que completaron la MAP-SR y 104 que completaron la Autoevaluación de los Síntomas Negativos (SNS). Mientras que como pruebas heteroaplicadas se aplicaron las versiones en español de la Entrevista Clínica de Evaluación de Síntomas Negativos (CAINS) y la Escala del Síndrome Positivo y Negativo de la Esquizofrenia (PANSS), como autoinformes se aplicaron la MAP-SR y SNS. **Resultados:** la versión en español de la MAP-SR ha mostrado excelente fiabilidad (α de Cronbach's=.923. Sus coeficientes de correlación han sido mayores con la CAINS [CAINS-Total: r=.608, p<.005; CAINS-subescala de Motivación y Placer (CAINS-MAP): r=.662, p<.005] que con las escalas negativas de la PANSS [PANSS-escala Negativa (PANSS-N): r=.393, p<.005; PANSS-Factor Negativo de Marder (PANSS-MNF): r=.478, p<.005]. La concordancia entre clínicos y pacientes fue baja en todos los casos, variando de un CCC de .661 a .392. **Conclusiones:** observamos pobre concordancia entre las puntuaciones de los pacientes y los clínicos, por lo que creemos que las evaluaciones de ambos no son mutuamente excluyentes, sino complementarias.

Palabras clave: esquizofrenia; síntomas negativos; evaluación; autoinforme; MAP.

Negative symptoms of schizophrenia are common, with almost 60% of patients reporting at least 1 negative symptom (Bobes et al., 2010) and 15%-30% meeting the criteria for the deficit syndrome (Arango et al., 1998; Carpenter et al., 1988). These symptoms are already present at the beginning of the disease and have been identified as one of the main predictors of functional impairment and quality of life (Brady et al., 2019; Menéndez-Miranda et al., 2015). Despite their importance, their measurement and treatment remain a challenge (García-Alvarez et al., 2018).

In recent years, efforts have been made to develop psychometric instruments to evaluate these symptoms accurately, since older

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instruments ["first-generation instruments" such as the Scale for Assessment of Negative Symptoms (SANS) and the Positive and Negative Syndrome Scale (PANSS)] had problems of content validity and assessment approach (García-Portilla & Bobes, 2013; García-Portilla et al., 2015). One of those efforts was "second-generation instruments" such as the Clinical Assessment Interview for Negative Symptoms (CAINS) (Kring et al., 2013) and the Brief Negative Symptom Scale (BNSS) (Kirkpatrick et al., 2011). A further step in this development was patient-reported outcome measures (PROMs) for the negative symptoms of schizophrenia in line with the increasing attention being paid to information provided by patients (Salagre et al., 2019; Weldring & Smith, 2013). Examples of those are the Motivation and Pleasure Scale-Self-Report (MAP-SR) (Llerena et al., 2013) or the Self-Evaluation of Negative Symptoms (SNS) (Dollfus et al., 2016). Furthermore, apart from clinicians and self-reported measures, there are as well phenomenologically oriented perspectives with their own psychometric instruments.

Before PROMs negative instruments, self-reported measures in schizophrenia had been mainly focus on quality of life (The WHOQOL Group, 1995), but not in negative symptoms. Furthermore, those quality of life instruments had showed discrepancies between clinicians, patients, and even proxies, raising doubts about the validity of patients' judgments regarding their symptoms (Bobes et al., 2007; Browne et al., 1996; Lehman, 1983). Nonetheless, there is widely recognized value in incorporating the patient point of view into the design of treatment and services.

It is important to notice that there is little research on the validity of negative self-reported measures in schizophrenia and there is no a Spanish version of the MAP-SR. Regarding validation studies of this scale they reported low to moderate correlation coefficients with the CAINS Experience subscale (Llerena et al., 2013; Richter et al., 2019), and moderate (Engel & Lincoln, 2016) or no correlation (Richter et al., 2019) with the PANSS negative subscale (PANSS-N) and Marder negative factor (PANSS-MNF, a composite score that includes seven PANSS items: five from the negative scale and two from the general scale) (Marder et al., 1997), respectively. In the case of the SNS, the strength of the correlation depends on the scale, moderate correlation coefficients have been reported with the Scale for the Assessment of Negative Symptoms (SANS) total score (Dollfus et al., 2016; Hervochon et al., 2018) and the CGI-S negative subscale (Dollfus et al., 2016; Hervochon et al., 2018) and low with the Brief Psychiatric Rating Scale (BPRS) negative subscore (Dollfus et al., 2016; Hervochon et al., 2018). Moreover, some studies (Engel & Lincoln, 2017; Fervaha et al., 2015; Song et al., 2019) have reported moderate to low overlap between clinician and patient symptom ratings, with correlation coefficients between .66 (Engel & Lincoln, 2017) and .34 (Fervaha et al., 2015).

Hence, this study aimed to validate the Spanish version of the MAP-SR and, mainly, determine the concordance and potential utility of patient-reported outcome measures for reflecting the severity of negative symptoms of schizophrenia alongside clinician-rated outcome measures.

Method

Participants

Using a non-probability convenience sampling, 174 subjects who completed the MAP-SR and 104 subjects, most of them belonging to the first sample, who completed the SNS, were included in the study. Inclusion criteria were (1) age ≥18 years; (2) schizophrenia (ICD-10); and (3) currently in treatment. Exclusion criteria: (1) inability to self-complete the questionnaires; and (2) refusal to sign informed consent.

The mean ages were 36.7 (12.2) for the MAP-SR sample and 40.1 (13.9) years for the SNS. Approximately two out three were males in both samples (62.6% and 64.4%, respectively) (see Table 1).

Instruments

Clinician-reported outcome measures (CROMs). Three scales were administered as CROMs. First, the Spanish version of the Positive and Negative Syndrome Scale (PANSS) (Peralta & Cuesta, 1994) which is a widely instrument for assessing psychopathology in patients with schizophrenia. It has 30 items and is divided in three scales: positive (seven items), negative (seven items) and general psychopathology (16 items). The PANSS had showed good interrater reliability and internal consistency (Cronbach's α) varies depending on the scale from .55 (general psychopathology) to .92 (negative scale). Due to content validity problems of the negative scale, it was created the Marder negative factor (PANSS-MNF) which is a composite score that includes seven PANSS items: five from the negative scale (N1. Blunted affect, N2. Emotional withdrawal, N3. Poor rapport, N4. Passive social withdrawal and N6. Lack of spontaneity/Flow of conversation) and two from the general scale (G7. Motor retardation and G16. Active social avoidance). Moreover, this factor does not include two items from the negative scale that could be considered from a cognitive dimension (N5. Difficulty in abstract thinking and N7. Steretyped thinking) (Marder et al., 1997). Second, the Spanish version of the Clinical Assessment Interview for Negative Symptoms (CAINS) (Valiente-Gómez et al., 2015) is a 13-items semi-structured interview to assess five negative symptoms (blunted affect, alogia, asociality, anhedonia and avolition).This scale has two subscales [Motivation and Pleasure (MAP, nine items which assess three areas: social, work/school and recreational activities) and Expression (EXP, four items)] and provides three scores (one for each subscale plus a global score). The CAINS had showed good inter-rater, intra-rater reliability and internal consistency (Cronbach's alpha=.93). Finally, the Spanish version of the Calgary Depression Scale (CDS) (Sarro et al., 2004) is a 9-item scale to assess depression in patients with schizophrenia that had shown good interrater reliability (>.73 for single items and .92 for total score), internal consistency (Cronbach's alpha .83) and construct validity.

Patient-reported outcome measures (PROMs). The Spanish versions of the Motivation and Pleasure Scale-Self-Report (MAP-SR) (Llerena et al., 2013) and the Self-Evaluation of Negative Symptoms (SNS) (García-Álvarez et al., 2020) were used by patients to self-rate the severity of negative symptoms. The Spanish versions of the MAP-SR is a 15-items instrument that derives from the "Motivation and Pleasure" subscale of the CAINS. It contains nine items to assess the intensity and frequency of pleasure in different areas and six items to assess asociality. On the other and, the Spanish version of SNS is a 20-items scale that includes five subscales (social withdrawal, diminished emotional range, alogia, abulia and anhedonia). It has demonstrated excellent internal consistency (Cronbach's alpha .915), moderate convergent validity with the other self-rated measure for negative symptoms of schizophrenia (MAP-SR score: r=.660, p<.001) and very good divergent validity (García-Álvarez et al., 2020). Finally, the

MOS 36-item Short-Form Health Survey (SF-36) was used to assess their self-perceived health status (Alonso et al., 1995). It is a 36-item instrument which is divided in 8 subscales: Physical Functioning; Physical Role Functioning; Bodily Pain; General Health Perceptions; Vitality; Social Functioning; Emotional Role Functioning and Mental Health, and two composite scores: Physical Component Summary and Mental Component Summary. It had shown an acceptable level of reliability (Cronbach's Alpha ranged from .71 to .94, except for Social Functioning scale= .45).

Table 1
Demographic and clinical characteristics of participants

	MAP-SR sample (n=174)		SNS sample (n=104)	
	n	**%**	**n**	**%**
Sex				
Males	109	62.6	67	64.4
Females	65	37.4	37	35.6
Civil status[1]				
Never married	112	75.7	55	70.5
Married	24	16.2	17	21.2
Divorced/widowed	12	78.1	7	8.3
Level of education[2]				
Primary	34	23.9	24	31.6
Secondary	90	60.4	43	56.6
University	23	15.7	9	11.8
Disability benefit due to schizophrenia	55	36.7	39	52.4
Hospitalizations: Yes	102	70.0	51	66.2
	M	**SD**	**M**	**SD**
Age	36.7	12.2	40.1	13.9
Level of education				
- Years of education	14.1	4.4	13.0	4.2
- Years repeated	1.6	0.7	1.5	0.7
Length of illness	8.8	10.2	11.8	12.1
Number of hospitalizations	2.4	2.3	2.1	1.7
Psychometric evaluation scores				
- CAINS-Total	25.6	12.1	29.5	12.0
- CAINS-MAP	19.3	9.2	21.9	9.0
- CAINS-EXP	6.3	4.1	7.6	3.9
- PANSS-Positive	12.8	5.3	13.2	5.6
- PANSS-Negative	18.2	5.5	19.2	5.0
- PANSS-Marder negative factor	17.9	6.0	19.1	5.6
- PANSS-General psychopathology	29.8	8.0	29.9	7.4
- CDS	3.2	4.1	3.0	3.5
- SF-36-Physical functioning	69.7	26.0	68.0	26.0
- SF-36-Physical role functioning	51.1	39.5	49.7	40.0
- SF-36-Bodily pain	45.3	14.1	45.4	14.0
- SF-36-General health perceptions	61.0	11.7	60.6	11.6
- SF-36-Vitality	61.9	13.0	61.0	13.5
- SF-36-Social functioning	47.7	14.7	47.7	14.4
- SF-36-Emotional role functioning	57.6	43.1	58.4	42.7
- SF-36-Mental health	60.3	13.3	60.2	13.2
- SF-36-Physical component summary	43.5	7.1	43.3	7.1
- SF-36-Mental component summary	39.5	7.0	39.7	7.0
- MAP-SR	28.4	11.3	29.7	11.2
- SNS-Total	16.1	9.3	16.1	9.3
-SNS-Social withdrawal	2.8	2.2	2.8	2.2
- SNS-Diminished emotional range	3.0	2.2	3.0	2.2
- SNS-Alogia	3.8	2.6	3.8	2.6
- SNS-Avolition	3.8	2.3	3.8	2.3
- SNS-Anhedonia	2.6	2.3	2.6	2.3

Note: CAINS: Clinical Assessment Interview for Negative Symptoms; CAINS-EXP: Expression subscale; CAINS-MAP: Motivation and Pleasure subscale; CDS: Calgary Depression Scale; MAP-SR: Motivation and Pleasure Scale-Self-Report; PANSS: Positive and Negative Syndrome Scale; SF-36: The 36-Item Short Form Health Survey questionnaire; SNS: Self-Evaluation of Negative Symptoms.
[1] For civil status: MAP-SR sample (n=148) and SNS (n=79). [2]For level of education: MAP-SR sample (n=147) and SNS (n=76)

Procedure

This is a cross-sectional, naturalistic study of outpatients with schizophrenia at two Mental Health Centers in Oviedo, Spain. All subjects were assessed by psychologists and were asked to complete some self-report questionnaires as well. The study was approved by the Clinical Research Ethics Committee of the Principado de Asturias (Ref. 140/15).

Data analysis

The data were analyzed using IBM SPSS Statistics (Version 24.0) (IBM Corp, 2016) and MedCalc Statistical Software, Version 16.4.3 (MedCalc Software, 2016). The level of significance was set at $p<.05$.

Validation of the Spanish MAP-SR scale

First, a descriptive analysis of the MAP-SR distribution scores was performed. Internal consistency was evaluated using Cronbach's α and Corrected Item-Total Correlation. Convergent and divergent validities were determined using self-rated measures to avoid the "rater confounder factor". Thus, for determining its convergent validity, we performed bivariate correlations between MAP-SR and SNS scores. Furthermore, as we had identified a strong correlation between clinician-rated depressive symptoms (CDS scores) and self-rated negative symptom scores, we repeated the same analyses using partial correlations controlling for CDS scores. In the case of divergent validity, we did the same analyses with the SF-36 scores.

Concordance between patient-reported and clinician-rated outcome measures

Pearson bivariate correlations and partial correlations controlling for CDS scores were performed to identify the strength of the linear association between clinician and patient ratings. We also repeated the same analysis after stratifying both samples according to presence/absence of persistent negative symptoms (PNS) using a proxy score of >25 for the CAINS total score to identify PNS (Li et al., 2018). Finally, we used the more rigorous Lin's concordance correlation coefficient (CCC) (Lin, 1989) to calculate the level of agreement between clinician and patient measures. Before using the CCC, we transformed direct scores into z-scores (M=0, SD =1). To calculate agreement, underestimation and overestimation percentages for patient ratings, we established that z-scores with values ≤-0.5 or ≥0.5 would represent underestimation and overestimation, respectively.

Results

Table 1 shows the demographic and clinical characteristics of samples. Concerning clinical characteristics, both samples had a similar proportion of patients with scores compatible with a

depressive state (CDS>4) (Sarro et al., 2004): MAP-SR: 28.6% and SNS: 29.9%. On the contrary, the proportion of subjects with persistent negative symptoms (PNS) according to the CAINS scores (Li et al., 2018) was higher in the SNS sample: CAINS-Total score: 66.7 vs. 49.7%, CAINS-MAP score: 67.7 vs. 57.4%, and CAINS-EXP score: 65.6% vs. 54.4%. In both samples, patients with PNS had a significantly longer length of illness and scored significantly higher on all instruments than patients without PNS. In the MAP-SR sample, patients with PNS were significantly older (Table 2).

Spanish validation of the MAP-SR

The MAP-SR mean score was 28.4 (11.3) without statistically significant differences according to sex [males: 29.2 (10.5), females: 26.6 (12.6), $p<.05$]. The Kolmogorov-Smirnov test indicates a non-normal distribution of the scores (*K-S* test=0.070, $p=.036$). However, values for their symmetry [Skewness=0.481 (se=0.184)] and pointeness [Kurtosis=0.084 (se=0.366)], althought different from zero, suggest a normal shape (both are between the +1 -1 range).

The Spanish version of the MAP-SR has demonstrated excellent reliability (Cronbach's $\alpha=.923$, and all Corrected Item-Total Correlation values >.3, .419-.75). Its convergent validity with the SNS was moderate, both when controlling for depressive scores ($r=.538$, $p<.001$) and without this control ($r=.660$, $p<.001$). Finally, it has a very good divergent validity with self-perceived health status [(bivariate correlations: SF-36: physical and mental summary component scores: $r=-.286$, $p<.05$ and $r=-.060$, $p>.05$, respectively), partial correlations: SF-36: physical and mental summary component scores: $r=-.312$, $p<.05$ and $r=.123$, $p>.05$, respectively)].

Concordance between negative symptom ratings by clinicians and patients

Regarding the MAP-SR, the strength of the association varies depending on the instrument used by clinicians, higher with the CAINS (CAINS-Total: $r=.608$, $p<.005$; CAINS-MAP: $r=.662$, $p<.005$) than with the PANSS negative scales (PANSS-N: $r=.393$, $p<.005$; PANSS-MNF: $r=.478$, $p<.005$). On the contrary, in the case of the SNS-Total, the strength of the association seems to be

Table 2
Differences by Persistent Negative Symptoms (PNS) in MAP-SR and SNS samples

	MAP-SR					SNS				
	No PNS		PNS			No PNS		PNS		
	M	SD	M	SD	Student's t	M	SD	M	SD	Student's t
Age	33.8	9.1	39.5	14.4	-3.111*	37.7	11.4	41.6	15.5	-1.374
Years of education	15.6	4.4	12.4	3.9	4.384	14.7	4.1	12.0	4.1	2.279*
Length of illness	6.3	6.4	11.3	12.5	-3.216*	8.7	8.2	13.6	13.6	-2.162*
PANSS-N	14.7	4.1	21.7	4.6	-10.433**	14.8	3.9	21.3	4.0	-7.537**
PANSS-MNF	13.8	4.0	22.0	4.8	-11.984**	13.7	4.0	21.6	4.3	-8.554**
CDS	1.8	2.3	4.7	4.9	-4.612**	1.4	2.0	3.8	3.8	-3.804**
MAP-SR	22.5	7.7	34.2	11.5	-7.715**	21.8	8.3	33.9	10.6	-5.601**
SNS	9.9	6.4	20.1	8.7	-5.814**	9.9	6.4	19.6	8.7	-5.566**

* $p<.05$; ** $p<.001$

Table 3
Pearson's correlation coefficients (r) between clinician-rated and patient-reported outcome measures

Patient-reported outcome measures	Clinician-reported outcome measures									
	CAINS-Total		CAINS-MAP		CAINS-EXP		PANSS-N		PANSS-MNF	
	BC	PC	BC	PC	BC	PC	BC	PC	BC	PC
MAP-SR	.608**	.539**	.662**	.587**	–	–	.393**	.334**	.478**	.391**
SNS										
- Total	.478**	.391**	.472**	.372**	.389**	.347**	.437**	.368**	.428**	.328**
- Social withdrawal	.365**	.301*	.370**	.304**	.271*	.226*	.339**	.282*	.347**	.270*
- Diminished emotional range	.333**	.274*	.304**	.226*	.327**	.320**	.364**	.338**	.348**	.290*
- Alogia	.351**	.271*	.321**	.227*	.342**	.307**	.354**	.283*	.325**	.243*
- Avolition	.334**	.199	.329**	.193	.273*	.168	.256*	.147	.265*	.133
- Anhedonia	.497**	.428**	.532**	.457**	.309**	.268*	.394**	.326**	.391**	.294*

Note: CAINS: Clinical Assessment Interview for Negative Symptoms; CAINS-MAP: Motivation and Pleasure subscale; CAINS-EXP: Expression subscale; MAP-SR: Motivation and Pleasure Scale-Self-Report; PANSS: Positive and Negative Syndrome Scale; PANSS-N: Negative scale; PANSS-MNF: Marder negative factor; SNS: Self-Evaluation of Negative Symptoms.
BC: Bivariate correlations. MAP-SR: n=169; SNS: n=94. PC: Partial correlations controlling for scores on the Calgary Depression Scale. MAP-SR: n=158; SNS: n=84.
* $p<.05$; ** $p<.005$

quite independent of the instrument used by clinicians [from .478 (p<.005) to .389 (p<.005)] (Table 3).

Since, we observed moderate correlations between depression scores (CDS) and self-rated negative symptom scores (MAP-SR: r=.512, p<.001; SNS: r=.507, p<.001), we used partial correlations controlling for CDS scores. However, it had little effect on the strength of the association between clinician and patient ratings, except for SNS avolition scale where all correlations lost their statistical significance (Table 3). Finally, we investigated whether the presence of PNS, identified using the CAINS-Total score, affected the strength of the association between negative symptom ratings by clinicians and patients. In the case of the MAP-SR, we found correlation coefficients that were low with the PANSS negative scales and moderate with the CAINS scales in the group without PNS. However, PNS was associated with a higher correlation coefficient for the CAINS-MAP subscale (r=.582 vs. .425) and with loss of statistical significance for the PANSS scales (Table 4). The results of the SNS did not show statistically significant correlations in any case, except for PANSS negative scales in the group without PNS, which showed moderate correlation coefficients (Table 4).

The concordance between clinician and patient ratings was low in all cases, CCC from .661, 95% CIS [.567, .738] to 0.392 [.257, .512] (Table 5). The presence of PNS varies exactly with the strength of the linear association, that is, higher CCC between the CAINS-MAP and the MAP-SR (PNS: CCC=.446, No PNS: CCC=.381) and lower in the rest (Table 5). In the case of the MAP-SR, there were no statistically significant differences between patient and clinician ratings using either the CAINS or the PANSS. However, the z-scores on the SNS were significantly lower than the z-scores on the CAINS-Total (*paired Student's t-test*=-2.501, p=.014). The percentages of agreement, underestimation and overestimation found between patient and clinician ratings are shown in Table 6.

Discussion

The Spanish version of the MAP-SR has demonstrated good psychometric properties. Moreover, our results suggest that in assessing negative symptoms of schizophrenia, the strength of the linear association and the concordance between scores on patient-reported and clinician-rated outcome measures is moderate at best,

Table 4
Pearson's correlation coefficients (r) between clinician-rated and patient-reported outcome measures by persistent negative symptoms

Patient-reported outcome measures	PNS	Clinician-reported outcome measures									
		CAINS-Total		CAINS-MAP		CAINS-EXP		PANSS-N		PANSS-MNF	
		BC	PC	BC	PC	BC	PC	BC	PC	BC	PC
MAP-SR	No PNS	.417**	.397**	.425**	.401**	–	–	.297*	.248*	.352**	.305*
	PNS	.376**	.365**	.582**	.534**	–	–	-.008	.006	.118	.087
SNS-Total	No PNS	.101	.197	.016	.130	.200	.220	.426*	.407*	.467*	.422*
	PNS	.120	.061	.143	.049	.024	.051	.131	.072	.059	-.017

Note: CAINS: Clinical Assessment Interview for Negative Symptoms; CAINS-MAP: Motivation and Pleasure subscale; CAINS-EXP: Expression subscale; MAP-SR: Motivation and Pleasure Scale-Self-Report; PANSS: Positive and Negative Syndrome Scale; PANSS-N: Negative scale; PANSS-MNF: Marder negative factor; PNS: Persistent negative symptoms; SNS: Self-Evaluation of Negative Symptoms.
BC: Bivariate correlations. Total sample: MAP-SR: n=169; SNS: n=96. No PNS subsample: MAP-SR: n=85; SNS: n=32. PNS subsample: MAP-SR: n=84; SNS: n=64. PC: Partial correlations controlling for scores on the Calgary Depression Scale. Total sample: MAP-SR: n = 158; SNS: n = 84. No PNS subsample: MAP-SR: n=79; SNS: n=26. PNS subsample: MAP-SR: n=76; SNS: n=55.
* p<.05; ** p<.005

Table 5
Lin's concordance correlation coefficients (CCC) between clinician-rated and patient-reported outcome measures in the total sample and by persistent negative symptoms

Patient-reported outcome measures		Clinician-reported outcome measures							
		CAINS-Total		CAINS-MAP		PANSS-N		PANSS-MNF	
		CCC	95% CI	CCC	95% CI	CCC	95% CI	CCC	95% CI
MAP-SR	Total	.607	.503, .694	.661	.567, .738	.392	.257, .512	.477	.352, .585
	No PNS	.358	.186, .509	.381	.204, .533	.313	.112, .489	.376	.186, .539
	PNS	.277	.128, .415	.446	.313, .563	-.007	-.214, .200	.112	-.093,.310
SNS-Total	Total	.462	.295, .602	–	–	.433	.257, .581	.424	.247, .574
	No PNS	.089	-.223, .385	–	–	.474	.157, .702	.549	.257, .750
	PNS	.081	-.087, .246	–	–	.123	-.110, .345	.054	-.175, .279

Note: CAINS: Clinical Assessment Interview for Negative Symptoms; CAINS-MAP: Motivation and Pleasure subscale; CAINS-EXP: Expression subscale; MAP-SR: Motivation and Pleasure Scale-Self-Report; PANSS: Positive and Negative Syndrome Scale; PANSS-N: Negative scale; PANSS-MNF: Marder Negative factor; PNS: Persistent Negative Symptoms; SNS: Self-Evaluation of Negative Symptoms.
Total sample: MAP-SR: n=169; SNS: n=96. No PNS subsample: MAP-SR: n=85; SNS: n=32. PNS subsample: MAP-SR: n=84; SNS: n=64. CCC: Concordance correlation coefficient; 95% CI: 95% confidence interval

Table 6
Concordance between patient and clinician ratings

Patient-reported outcome measures		Clinician-reported outcome measures							
		CAINS-Total		CAINS-MAP		PANSS-N		PANSS-MNF	
		n	%	n	%	n	%	n	%
MAP-SR**	-Agreement	–	–	106	62.7	79	46.7	86	50.8
	-Underestimation	–	–	35	20.7	41	24.3	34	20.2
	-Overestimation	–	–	28	16.6	49	29.0	49	29.0
SNS-Total*	-Agreement	46	48.0	–	–	37	38.6	40	41.6
	-Underestimation	30	31.3	–	–	31	32.2	28	29.2
	-Overestimation	20	20.7	–	–	28	29.2	28	29.2

Note: CAINS: Clinical Assessment Interview for Negative Symptoms; CAINS-MAP: Motivation and Pleasure subscale; MAP-SR: Motivation and Pleasure Scale-Self-Report; PANSS: Positive and Negative Syndrome Scale; PANSS-N: Negative scale; PANSS-MNF: Marder negative factor; SNS: Self-Evaluation of Negative Symptoms.
* $p<.05$; ** $p<.001$

with greater support for the MAP-SR than SNS. In addition, the strength of the linear association decreases after controlling for scores on the CDS, to the point that it completely disappears on the SNS avolition subscale. On the contrary, PNS affect the two scales differently. While their presence is associated with no concordance on the SNS scale even before controlling for depressive symptoms, in the case of the MAP-SR, there is a stronger association before and after controlling for depressive symptoms and a higher concordance on ratings with the CAINS-MAP subscale.

Despite the great interest of this subject, we found relatively little literature reporting on the association and concordance between clinician-rated and patient-reported negative symptomatology. In general, and consistent with our results, the few studies that were not conducted to validate a scale demonstrated moderate to low associations between clinician and patient ratings. Song et al. (2019) reported a moderate strength of association between clinician BPRS negative scores and patient CGI-SCH negative symptoms scores and as did Engel and Lincoln (2017) between scores on the CAINS-MAP and MAP-SR. Contrariwise, Fervaha et al. (2015) reported a low correlation coefficient between clinician and patient ratings on the CGI-S. Unfortunately, these studies did not describe the effects of depressive and persistent negative symptomatology on these associations.

The three studies conducted to validate the MAP-SR employed the CAINS Experience subscale as a convergent validator, as well as the PANSS Negative subscale (Engel & Lincoln, 2016) or its Marder negative factor (Richter et al., 2019). As in our case, the correlation coefficient was greater when the CROM was the CAINS instead of the PANSS which makes sense taking into account that the MAP-SR derives from the "Motivation and Pleasure" subscale of the CAINS.

Focusing on the association between the MAP-SR and the CAINS-EXP, the reported results were largely discrepant, ranging from -.34 to .65 (Engel & Lincoln, 2016; Llerena et al., 2013; Richter et al., 2019). Our initial results were almost identical to two studies (Engel & Lincoln, 2016; Llerena et al., 2013) even after controlling for depressive symptomatology. However, when we considered the presence or absence of PNS as described by Li et al. (2018), the strength of the correlation decreased in both groups, but more in the No PNS group, and these decreases were greater when controlling for depressive symptomatology. Therefore, the persistence of the negative symptoms may allow patients greater insight into them, and thus a greater correlation with clinician ratings.

The results of Ritcher et al. (2019) merit special attention because, besides to finding a lower strength of agreement with the CAINS compared with our results and the results of the other two studies, the association they found was inverse which seriously calls into question the usefulness of the MAP-SR.

Regarding SNS, our results were more uniform than previous studies using SANS, BPRS and CGI-S negative subscale (Dollfus et al., 2016; Hervochon et al., 2018). We found moderate correlation coefficients between the SNS-Total and both the CAINS and the PANSS (from .48 to .39).

Contrary to the MAP-SR, the moderate to low correlation between the SNS and the PANSS found in the No PNS group disappeared in the PNS group, even after controlling for depression. We could speculate that the MAP-SR and the SNS behave differently regarding the persistence of the negative symptoms. Whereas the MAP-SR appears to be associated with greater insight and more accurate patient rating of these symptoms, the SNS apparently produces the phenomenon of adaptation to these symptoms and, consequently, underestimation of them by patients compared with clinicians.

We found poor concordance between patient and clinician ratings as indicated by the Lin's Concordance Correlation Coefficient. McBridge (2005) established that values <.90 suggest poor strength of agreement, and all of our CCC values are well below that threshold (from .661 to .054). Furthermore, we found that patient ratings with the SNS were significantly lower than clinician ratings with the CAINS-Total. This is congruent with the results of Song et al. and Fervaha et al, who also reported lower patient ratings on the CGI negative symptoms compared with clinician ratings.

Concerning the percentages of agreement between patient and clinician ratings, we found greater concordance between ratings for the MAP-SR, independent of the instrument employed by clinicians, than for the SNS. Furthermore, while with the MAP-SR, the proportion of patients who underestimated versus overestimated their symptoms depended on the instrument employed by clinicians, with the SNS, the proportion of patients who underestimated versus those who overestimated their symptoms was slightly greater, independent of the instrument employed by clinicians. In this sense, Engel and Lincoln (2017) found that only 46% of

patients had relatively equal self- and observer-ratings using the MAP-SR and the CAINS-MAP subscale, with 40% of patients underestimating the severity of their negative symptomatology. Our results were more positive, since 62.7% of patients rated approximately equal to clinicians, and only 20.7% underestimated their severity using the same instruments.

Those discrepancies between patients and clinicians could be related to a progressive adaptation to those symptoms in some patients, and, if asociality is present, to a restricted social network. If there is a reduction in the intensity or frequency of some experiences and activities that increases over the time could be difficult to compare the current level with a normal level or the level that they had several years ago. However, clinicians could compare those activities and symptoms between different patient severity levels. On the other hand, clinicians could have higher expectations and patients could be satisfied with their current performance.

This study has some limitations. First, the lack of patients with extremely severe negative symptoms does not allow us to obtain information from all possible patient profiles. Second, the cross-sectional design does not let us to see possible changes in concordance between patients and clinicians over the time and the ability of the MAP to detect those changes. However, as strengths of our study, we would highlight the sample size and the inclusion criteria. Compared with previous studies, our samples are considerably larger, and more than double in several cases. In addition, all patients included had a diagnosis of schizophrenia, while in the majority of the published studies, patients with schizoaffective disorder were also included. We think that the affective part of this diagnosis may be an "extra" confounding factor when rating pure negative symptomatology. Finally, to our knowledge, this is the first study to try to identify the influence of depressive and persistent negative symptomatology when self-reporting on negative symptomatology.

Our results have several implications for daily clinical practice and research. Firstly, when choosing the evaluation instruments, it is preferable that the clinician use the CAINS rather than the PANSS, especially with the MAP-SR. Secondly, clinicians and researchers should be aware of the effect of depressive and persistent negative symptomatology on the concordance between ratings by patients and clinicians. Thirdly, we must be cautious when considering the possibility of replacing clinician evaluations with patient self-reports. Before even thinking about it, researchers and experts must define exactly what should be the minimum level of agreement and develop more precise instruments to provide it. Overall, we believe that evaluations by clinicians and patients are not mutually exclusive but complementary. In addition to the common information provided by both, each provides unique and valuable additional information for planning and monitoring the results of interventions. Therefore, within the framework of patient-centered clinical practice, we recommend using both types of measurements.

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