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Subjective and objective assessment of negative symptoms in patients with schizophrenia and their clinical and functional associations

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ABSTRACT

Background and Objectives: Negative symptoms significantly affect psychosocial functioning and prognosis in schizophrenia. While clinician-rated scales are standard practice, the clinical value of patient-reported subjective assessments remains underexplored. This study investigated associations between subjective (Self-evaluation of Negative Symptoms, SNS) and objective clinician-rated (modified Short Assessment of Negative Domain-negative subscale, m-SAND-N) assessments, their predictive relationships, and links with psychosocial functioning (Personal and Social Performance, PSP).

Methods: This cross-sectional analysis included 188 outpatients with schizophrenia from 20 psychiatric clinics in Slovakia. Participants completed the SNS, followed by structured clinical interviews assessing negative symptoms (m-SAND), clinical severity (CGI-S), PSP, insight, and adherence. Correlation analyses and hierarchical multiple regressions examined the relationships among demographic, clinical, subjective/objective negative symptoms, as well as psychosocial functioning.

Results: Clinician-rated negative symptoms (m-SAND-N) showed significant correlations with patient-reported negative symptoms (SNS; $r = 0.38$, $p < 0.001$) and with poorer psychosocial functioning (PSP; $r = 0.68$, $p < 0.001$). In hierarchical regression, objective negative symptoms were the principal factor associated with higher subjective ratings ($\beta = 0.332$, $p < 0.001$). Conversely, higher SNS scores ($\beta = 0.179$, $p < 0.001$), greater overall illness severity (CGI-S; $\beta = 0.156$, $p < 0.05$) and poorer psychosocial functioning (PSP; $\beta = 0.583$, $p < 0.001$) were jointly related to more severe clinician-rated negative symptoms, together accounting for 50.7 % of their variance. Subjective ratings of affective blunting did not correlate significantly with clinician assessments, highlighting a divergence between patient- and clinician-reported measures.

Conclusions: Integrating subjective patient assessments with objective clinician ratings provides a comprehensive understanding of negative symptoms, facilitating improved treatment approaches and psychosocial outcomes in schizophrenia. Clinicians should consider patient insight when interpreting discrepancies, especially in affective blunting.

Introduction

Negative symptoms in schizophrenia represent a crucial dimension of psychopathology, significantly impacting the psychosocial functioning, quality of life, and overall prognosis of patients[1,2]. Historically, negative symptoms have been conceptualised as reductions or deficits in normal emotional and behavioural functions, encompassing blunted affect, alogia, anhedonia, avolition, and asociality[3,4]. Recent research highlights that these symptoms typically cluster into two distinct domains: diminished emotional expression (including blunted affect and alogia) and avolition-apathy (encompassing anhedonia, avolition, and asociality). Each domain has distinct clinical characteristics, underlying mechanisms, and treatment implications[1,2,5].

Despite their clinical significance, negative symptoms often remain resistant to available treatments, frequently persist during clinically stable phases of schizophrenia, and strongly predict poor functional outcomes[6,7]. Current pharmacological and psychosocial interventions exhibit limited effectiveness, particularly in patients with predominant negative symptomatology, highlighting an unmet need in clinical care[4,8,9]. Consequently, accurate assessment and differentiation of

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negative symptom domains are essential for tailoring individualised therapeutic strategies and ultimately enhancing patient outcomes[1,7].

Traditionally, negative symptoms have been assessed using clinician-administered scales, such as the Scale for the Assessment of Negative Symptoms (SANS), as well as more recently developed structured instruments, including the Clinical Assessment Interview for Negative Symptoms (CAINS) and the Brief Negative Symptom Scale (BNSS)[7,10]. However, clinician-rated tools primarily capture observable behaviours and external manifestations of symptoms, potentially overlooking patients' internal subjective experiences, such as diminished motivation or reduced emotional experience, that are not directly observable[11,12]. Recent advances in psychometric assessment emphasise the integration of subjective self-assessment tools to provide complementary insights into patients' internal experiences of negative symptoms, which might otherwise remain undetected in clinical practice[12–14].

Empirical studies have identified notable discrepancies between subjective patient reports and objective clinician-rated assessments of negative symptoms, carrying substantial implications for clinical practice and patient care[14]. Subjective assessments may reveal aspects of symptomatology that are not readily apparent to clinicians, thereby enhancing the accuracy and comprehensiveness of symptom evaluation, fostering patient engagement, and informing targeted treatment strategies[13,14]. However, the exact nature of the relationships and predictors connecting subjective negative symptom experiences, objective clinical evaluations, and psychosocial functioning remains insufficiently understood[2,6].

Given this context, our study systematically investigates the associations and predictive relationships between subjective patient-reported negative symptoms, as assessed using the Self-Evaluation of Negative Symptoms (SNS) scale, and clinician-rated negative symptoms, as assessed via the modified Short Assessment of Negative Domain (m-SAND)[12]. Originally, the m-SAND consists of seven items covering both negative and positive symptoms; however, for methodological consistency and accurate comparison with the SNS, we specifically focused on its negative subscale (m-SAND-N), comprising the five core negative symptom constructs (anhedonia, alogia, avolition, asociality, and affective flattening), thus aligning directly with the five negative symptom domains assessed by the SNS scale[12]. This methodological alignment allows us to directly compare subjective (patient-reported) and objective (clinician-observed) evaluations of the same symptom constructs, ensuring that observed differences genuinely reflect divergent perspectives rather than differing symptom definitions.

The study further aims to clarify the correlation between these subjective and objective assessments and real-world psychosocial functioning, as measured by the Personal and Social Performance (PSP) scale, in a representative clinical sample of Slovak patients with schizophrenia. Addressing these knowledge gaps is critical, as enhanced understanding of how subjective symptom experiences align or diverge from observed clinical ratings and relate to functional outcomes could substantially inform clinical management strategies. Such insights could help clinicians adopt a more patient-centred approach, effectively integrate self-assessment instruments into routine clinical practice, and ultimately improve therapeutic outcomes and quality of life for patients living with schizophrenia and persistent negative symptoms.

Our study provides a unique contribution by integrating five identical negative symptom domains between the SNS and m-SAND-N scales, enabling direct comparability of subjective and objective assessment. While most previous studies have compared different instruments with non-identical domains, our methodological approach eliminates this confounding variable. The methodological alignment of symptom domains ensures that observed differences truly reflect divergent perspectives rather than different symptom definitions, which is a critical limitation identified in previous studies. Additionally, it represents the largest Central European cohort examining these relationships in relation to functional outcomes, as measured by the PSP scale.

Although EPA guidelines from 2021 emphasize the need to integrate self-assessment tools into clinical practice, systematic comparisons of subjective and objective assessments in identical domains remain limited. Recent studies have focused primarily on the psychometric properties of self-assessment scales or on specific aspects, such as defeatist beliefs; however, comprehensive analyses of the relationships between subjective and objective assessments in the context of functional status have remained insufficiently explored.

Materials and methods

Patient characteristics

The basic sociodemographic and clinical characteristics of the patient sample included in this analysis have been published in detail elsewhere[15]. The current paper explicitly addresses the analysis of relationships between subjective and objective assessments of negative symptoms, extending previous findings by including their associations with patients' functional status.

The study included patients diagnosed with schizophrenia recruited from 20 psychiatric outpatient clinics across Slovakia. Data collection occurred from March 2020 to November 2020. Patients eligible for the study were adults aged between 18 and 65 years, diagnosed with schizophrenia according to the International Classification of Diseases, 10th edition (ICD-10), and exhibiting predominant negative symptoms. Predominant negative symptoms were identified according to European Psychiatric Association (EPA) criteria as the presence of at least two negative symptoms of moderate or higher severity (score $\geq$3 on the 5-point m-SAND scale)[16].

A total of 188 adult patients (64.9 % males, 35.1 % females) meeting these criteria participated in the study. Patients with comorbid neurological disorders or significant cognitive impairment were excluded from participation.

Participants completed the Self-evaluation of Negative Symptoms (SNS) scale, a self-reported questionnaire, followed immediately by a structured psychiatric interview conducted by trained psychiatrists. Sociodemographic characteristics (age, gender, employment status), clinical information (duration of disease, disability status, insight into illness, treatment adherence), and outcome measures, including the Clinical Global Impression-Severity scale (CGI-S), modified Short Assessment of Negative Domain (m-SAND), and Personal and Social Performance (PSP) scale, were collected during this interview. Disease duration was confirmed using patient medical records. All instruments used in the study underwent a formal process of translation and cultural adaptation to Slovak, ensuring their validity and reliability in the target population.

Ethical considerations

The study received ethical approval from the Ethics Committee of the Košice Self-Governing Region (approval number: 3618/2020/ODDZ-07169). Written informed consent was obtained from all participants in the study. The study was conducted in accordance with the Declaration of Helsinki and adhered to the principles of confidentiality and voluntariness throughout its execution.

Measures

Negative symptoms were assessed using structured clinical interviews, following the guidelines of the European Psychiatric Association (EPA)[16]. Insight was operationally defined as "a person's capacity to understand the nature, significance, and severity of their own illness"[17], classified by psychiatrists as full, partial, or absent based on clinical judgment during the interview. Similarly, treatment adherence was categorised as full, partial, or absent by psychiatrists based on patients' recent treatment history.

The Self-evaluation of Negative Symptoms (SNS) scale is a self-

administered questionnaire designed to evaluate five primary domains of negative symptoms (anhedonia, avolition, asociality, alogia, and affective blunting) in schizophrenia and schizoaffective disorder. The SNS provides valuable insights into patients' subjective experiences, complementing clinician-rated assessments and promoting patient engagement in the evaluation process. The SNS is a 20-item patient-reported scale, each item is rated on a 3-point Likert scale from 0 to 2, with higher scores indicating greater severity of negative symptoms[12]. Cronbach's alpha for the total SNS scale was 0.82, which is considered good internal consistency reliability according to established psychometric standards. Subscale reliabilities were not calculated separately due to the limited number of items per domain.

The Clinical Global Impression-Severity (CGI-S) scale is a single-item clinician-rated instrument measuring overall illness severity in psychiatric populations on a 7-point Likert scale. It is a widely used and validated tool reflecting clinicians' global assessment of patients' clinical status[19].

The modified Short Assessment of Negative Domain (m-SAND) is a clinical scale composed of seven items, divided into positive (delusions and hallucinations; m-SAND-P) and negative (anhedonia, alogia, avolition, asociality, affective flattening; m-SAND-N) subscales. Each item is scored from 1 (not observed) to 6 (extreme), with higher scores indicating more severe symptoms and worse functioning[18]. The m-SAND was selected for its simplicity and comprehensive coverage of negative symptom constructs. The m-SAND scale was modified from the original SAND by reducing the 7-point rating scale (0–6) to a 6-point scale (1–6) to eliminate the difficulty in differentiating between 'minimal' and 'mild' severity levels. This modification enhances clinical utility while maintaining sensitivity to detect changes in symptom severity[15]. Cronbach's alpha for the total m-SAND score in this study was 0.75.

The Personal and Social Performance (PSP) scale assesses the routine social functioning of psychiatric patients, independent of symptomatology, across four domains: socially useful activities, personal and social relationships, self-care, and disturbing/aggressive behaviours[20,21]. The full version of the PSP scale was used, with a nonstandard analytic scoring chosen a priori to preserve the ordinal information of domain severity anchors and to align directionality with other measures. Items are rated from 1 (absent) to 6 (very severe), yielding total gross scores ranging from 5 to 22, where higher scores indicate worse functioning. Cronbach's alpha for the PSP in this study was 0.77.

Statistical analyses

To investigate associations among socio-demographic characteristics, clinical variables, subjective and objective assessments of negative symptoms, and psychosocial performance, the analyses proceeded as follows: initially, descriptive statistics (means, standard deviations, and ranges) were calculated for all variables (Table 1). Employment status was categorised into two groups for analysis: (1) employed full-time, part-time, or studying, and (2) unemployed, occasionally employed, or retired.

Correlations among socio-demographic variables, disease characteristics, clinical severity, insight, adherence, m-SAND, m-SAND-N, SNS, and PSP (Tables 2 and 3) were assessed using Pearson's or Spearman's correlation coefficients, depending on the variable characteristics.

Hierarchical multiple regression analyses using the "enter" method were conducted separately for predicting subjective negative symptoms (SNS) and objective negative symptoms (m-SAND-N). For predicting subjective negative symptoms (SNS), age, insight, and adherence were entered in the first step. In the second step, functional indicators (employment status, disability status, and PSP scores) were included. Finally, in the third step, objective clinical ratings (CGI-S and m-SAND-N scores) were added. For the prediction of objective negative symptoms (m-SAND-N), the first two steps were identical. In the third step, clinical severity (CGI-S) and subjective negative symptoms (SNS scores) were included. This hierarchical approach enabled the incremental exploration of how additional layers of predictors—including functional and clinical assessments, which can be either subjective or objective depending on the dependent variable—explained variance beyond that explained by basic demographic and baseline clinical characteristics alone. Analyses were performed using the Statistical Package for the Social Sciences (SPSS), version 26.0 (IBM Corp., Chicago, IL, USA).

Table 1
Description of the study sample (n = 188).

Variable	Mean (±SD)	Range
Age	39.8 ± 10.8	19 - 73
Duration in years	12.0 ± 9.0	0.5–40
CGI-S[a]	4.3 ± 1.1	2–7
SNS[a]	27.4 ± 7.3	6–40
m-SAND[a]	23.6 ± 5.0	8–37
m-SAND-N[a]	19.1 ± 3.84	5–28
PSP[a]	13.5 ± 3.4	5–22

Note: CGI-*S*=Clinical Global Impression of Severity; SNS=Self-evaluation of Negative Symptoms; m-SAND= modified Short Assessment of Negative Domain; m-SAND-*N*=negative subscale of m-SAND; PSP= Personal and Social Performance.

[a] Higher gross score indicates worse functioning.

Results

Basic description of the sample

A detailed description of the study sample (n = 188) is provided in Table 1. Participants had a mean age of 39.8 years (SD = 10.8), with a higher proportion of males (n = 122, 64.9 %) compared to females (35.1 %). Most participants were unemployed (120, 63.8 %), while full-time jobs were present in 17 participants (9.0 %), part-time jobs in 21 participants (11.2 %), and occasionally working in 20 participants (10.6 %). Additionally, there were 5 students (2.7 %) and 5 retired participants (2.7 %). An average illness duration was 12.0 years (SD = 9.0, range 0.5–40years).

A majority (n = 147, 76.7 %) received disability pensions primarily due to psychiatric conditions. Full insight into their illness was observed in only 38 (20.2 %) of patients, partial insight was in 132 (70.2 %) patients, and none in 18 (9.6 %) ones. Full adherence to treatment was reported in 76 (40.4 %) patients, partial adherence in 96 (51.1 %), and none in 16 (8.5 %) participants. The mean Clinical Global Impression-Severity (CGI-S) score indicated moderate illness severity (4.3 ± 1.1). The average scores for the modified Short Assessment of Negative Domain (m-SAND) and Self-evaluation of Negative Symptoms (SNS) scales were 23.6 ± 5.0 and 27.4 ± 7.3, respectively. The specific negative symptom sub-score (m-SAND-N) had a mean of 19.1 ± 3.84 (range, 5–28). The mean score on the Personal and Social Performance (PSP) scale was 13.5 ± 3.4, indicating moderate functional impairment.

Correlations among study variables

Correlations among study variables are summarised in Table 2. Age correlated positively with employment status, disease duration, and disability, and negatively with adherence. Employment status was significantly associated with disease duration, disability, m-SAND, m-SAND-N, and PSP scores. Disease duration strongly correlated with disability status. Disability correlated positively with CGI-S and objective negative symptom ratings (m-SAND, m-SAND-N). Insight showed significant associations with adherence, CGI-S, both objective negative symptom measures (m-SAND, m-SAND-N), and PSP scores. Treatment adherence correlated significantly with CGI-S, m-SAND, m-SAND-N, and PSP.

Severity of clinical symptoms (CGI-S) showed strong positive correlations with subjective negative symptoms (SNS), objective negative symptoms (m-SAND, m-SAND-N), and PSP scores. Subjective negative

Table 2
Correlations between the studied variables ($n = 188$).

	Gender	Age	Employment status	Duration	Disability	Insight	Adherence	CGI-S	SNS	m-SAND	m-SAND-N	PSP
1. Gender	1											
2. Age	0.23**	1										
3. Employment status	ns	0.19*	1									
4. Duration	ns	0.70**	0.26**	1								
5. Disability	ns	0.38**	0.45**	0.48**	1							
6. Insight	ns	ns	ns	ns	ns	1						
7. Adherence	ns	−0.11*	ns	ns	ns	0.60**	1					
8. CGI-S	ns	ns	0.20**	ns	0.19*	0.27**	0.17*	1				
9. SNS	ns	ns	ns	ns	ns	ns	ns	0.15*	1			
10. m-SAND	ns	ns	0.17*	ns	0.15*	0.28**	0.26**	0.59**	0.31**	1		
11. m-SAND-N	ns	ns	ns	ns	ns	0.20**	0.15*	0.45**	0.38***	0.90***	1	
12. PSP	ns	ns	0.21**	ns	ns	0.33**	0.37**	0.58**	0.21**	0.73**	0.68***	1

Note:.
* $p < 0.05$.
** $p < 0.01$; ns=no significance; Employment status 1=employed fully, part time/studying, 2=not employed; occasionally, retired; Gender 1=men, 2= women; CGI-*S*=Clinical Global Impression of Severity; SNS=Self-evaluation of Negative Symptoms; m-SAND= modified Short Assessment of Negative Domain; PSP= Personal and Social Performance; m-SAND-*N*=negative subscale of m-SAND.
*** $p < 0.001$;, given that this level of significance appears in the table 2.

Table 3
Correlations between m-SAND and SNS subscales ($n = 188$).

Subscales SNS m-SAND	Social isolation SNS	Affective blunting SNS	Alogia SNS	Avolition SNS	Anhedonia SNS
Hallucinations m-SAND-P	0.16*	**ns**	ns	0.16*	0.21**
Delusions m-SAND-P	ns	**ns**	ns	ns	ns
Anhedonia m-SAND-N	0.33**	**ns**	0.29**	0.28**	0.32**
Affective blunting m-SAND-N	0.23**	**ns**	0.15*	ns	0.17*
Avolition, apathy m-SAND -N	0.21**	**ns**	0.21**	0.16*	0.20**
Alogia m-SAND-N	0.20**	**ns**	0.14*	0.18*	0.15*
Asociality m-SAND-N	0.26**	**ns**	ns	ns	0.21**

Note:.
* $p < 0.05$.
** $p < 0.01$; ns=no significance; SNS=Self-evaluation of Negative Symptoms; m-SAND=modified Short Assessment of Negative Domain; m-SAND-*P*=modified Short Assessment of Negative Domain-Positive Subscales; m-SAND-*N*=modified Short Assessment of Negative Domain-Negative Subscales.

symptoms (SNS) correlated significantly with both the full objective negative symptom scale (m-SAND) and the negative subscale (m-SAND-N), as well as with PSP. Additionally, the objective negative symptom subscale (m-SAND-N) demonstrated a robust and significant correlation with subjective negative symptoms (SNS), confirming that subjective and objective assessments of identical negative symptom domains were closely aligned. Both m-SAND and m-SAND-N scores also showed strong correlations with PSP, indicating significant relationships between clinician-rated negative symptoms and patient psychosocial functioning.

Correlations between m-SAND and SNS subscales showed strong positive associations across most domains, except for affective blunting, which showed no significant correlation (Table 3).

Negative symptoms in schizophrenia

Hierarchical multiple regression analyses were conducted separately to predict subjective and objective negative symptoms. For subjective negative symptoms (SNS), the hierarchical model explained 12.2 % of the variance. In the first step, age, insight, and adherence were entered as predictors, but these did not significantly predict SNS scores. In the second step, employment status, disability status, and psychosocial functioning (PSP) were included as indicators of functional status, but also did not significantly explain additional variance. However, in the third step, adding objective clinical ratings — specifically, CGI-S and objective negative symptoms (m-SAND-N) — significantly increased the explained variance. Within this step, m-SAND-N emerged as the only significant predictor ($\beta = 0.332$, $p \leq 0.001$), highlighting the substantial contribution of objective clinician-rated symptoms in predicting subjective patient-reported negative symptoms (Table 4).

In predicting objective negative symptoms (m-SAND-N), the hierarchical regression model accounted for 50.7 % of the variance. Steps one and two, which included age, insight, adherence, employment status, disability status, and PSP, indicated that psychosocial functioning (PSP) was a significant predictor ($\beta = 0.583$, $p \leq 0.001$). The addition of clinical severity (CGI-S) and subjective negative symptom ratings (SNS) in the third step significantly improved the model. Both CGI-S ($\beta = 0.156$, $p \leq 0.05$) and SNS ($\beta = 0.179$, $p \leq 0.001$) contributed significantly as predictors of m-SAND-N scores, while PSP remained highly significant. These findings emphasise that psychosocial functioning and subjective patient assessments are both strongly associated with objective clinician-rated negative symptoms (Table 5).

In our hierarchical regression analyses, multicollinearity was ruled out (tolerance > 0.10; VIF < 5). Correlation analyses were performed for exploratory purposes only to identify potential relationships between variables prior to regression modelling; therefore, no formal correction for multiple comparisons was applied to these preliminary analyses. The primary inferences in Table 2 are derived from hierarchical regression models that inherently account for shared variance among predictors, thereby reducing the risk of spurious associations due to multiple testing.

Discussion

This study examined relationships between clinician-rated and self-reported negative symptoms and their associations with psychosocial functioning in patients with schizophrenia. A central finding was the

Table 4
Hierarchical multiple regression analysis predicting subjective negative symptoms (SNS) from demographic, functional, and objective clinical variables ($n = 188$).

		R^2	Adjusted R^2	S.E.	Standardized Coefficients β	p
1st step	**Age**			0.053	−0.023	0.766
	Insight			1.230	−0.102	0.260
	Adherence	0.001	−0.015	1.090	−0.003	0.971
2nd step	**Employment status**			1.916	0.068	0.423
	Disability			1.549	0.048	0.596
	PSP	0.066	0.035	0.242	0.010	0.931
3rd step	**CGI-S**			0.598	−0.020	0.827
	m-SAND-N	0.122	0.083	0.189	0.332	0.001

Note: For abbreviations, see Table 1.

Table 5
Hierarchical multiple regression analysis predicting objective negative symptoms (m-SAND-N) from demographic, functional, and subjective clinical variables ($n = 188$).

		R^2	Adjusted R^2	S.E.	Standardized Coefficients β	p
1st step	**Age**			0.020	0.001	0.979
	Insight			0.473	0.060	0.368
	Adherence	0.049	0.033	0.415	−0.123	0.069
2nd step	**Employment status**			0.736	−0.033	0.589
	Disability			0.595	0.021	0.746
	PSP	0.482	0.465	0.078	0.583	0.000
3rd step	**CGI-S**			0.226	0.156	0.018
	SNS	0.528	0.507	0.028	0.179	0.001

Note: For abbreviations, see Table 1.

robust relationship between clinician-assessed negative symptoms, measured using the five-item negative subscale of the modified Short Assessment of Negative Domains (m-SAND-N), and reduced psychosocial performance, as assessed by the Personal and Social Performance scale (PSP). These results align closely with existing literature confirming negative symptoms as strong predictors of functional impairment[6,20,22–24].

Additionally, subjective negative symptom ratings, as measured by the Self-evaluation of Negative Symptoms (SNS), showed significant correlation with both clinician-rated negative symptoms (m-SAND-N) and PSP scores. This convergence demonstrates that subjective patient assessments reliably reflect clinically meaningful symptom dimensions and real-world functional status, confirming earlier evidence that self-report scales provide valuable complementary information often overlooked by purely observational assessments[11,13,14].

Hierarchical regression analyses further highlighted the reciprocal relationship between subjective and objective assessments. In predicting subjective negative symptoms (SNS), clinician-rated negative symptoms (m-SAND-N) emerged as the sole significant independent predictor ($\beta = 0.332$, $p \leq 0.001$), after controlling for demographics, clinical characteristics, and functional indicators. Conversely, when predicting objective clinician-rated symptoms (m-SAND-N), subjective symptom ratings (SNS) contributed significantly ($\beta = 0.179$, $p \leq 0.001$) alongside global illness severity (CGI-S) and functional status (PSP). Clinician-rated symptoms, clinical severity, and functional variables accounted for approximately 12 % of the variance in subjective symptoms, whereas the inclusion of subjective ratings explained around 51 % of the variance in objective symptoms. This suggests that clinician ratings are substantially informed by both observed severity and patients' self-perceptions, emphasising the need for comprehensive assessment strategies combining multiple perspectives[5,25,26].

Despite overall agreement, notable discrepancies were explicitly observed in the assessment of affective blunting. Patient-reported emotional flattening on the SNS did not correlate significantly with clinician-rated emotional expression on the m-SAND-N. This finding aligns with previous studies that have shown patient-clinician divergences in evaluating expressive deficits[1,10,13]. A possible explanation for this discrepancy is patient insight, as patients with limited insight may be less aware of emotional flattening and thus underreport its severity[13]. This emphasises that clinicians should carefully interpret self-reports in the context of patient insight, remaining attentive to subtle expressive deficits even when patients do not explicitly report them. Conversely, patients' consistent self-reporting of avolition, anhedonia, alogia, and asociality suggests greater self-awareness of motivational and experiential symptoms, indicating that subjective scales effectively capture these internal experiences.

Clinically, these findings strongly support the integration of subjective assessments into routine clinical practice. Including patient-reported measures, such as the SNS, can significantly enhance symptom evaluation by capturing patient experiences and priorities that might otherwise remain unnoticed by clinicians[12,13,27,28]. The complementary use of subjective and objective scales facilitates personalised treatment planning, strengthens therapeutic alliances, and aligns interventions more closely with patient-experienced distress and functional difficulties. Furthermore, recognising the differential patient awareness across symptom domains can guide targeted clinical interventions. Specifically, motivational and experiential deficits (e.g., avolition, anhedonia) appear highly amenable to patient self-reporting and could benefit from psychosocial interventions aimed at enhancing motivation and engagement. In contrast, expressive deficits, such as affective blunting, may require clinician-driven interventions, including social skills training or feedback-oriented approaches, particularly when patients display limited insight or awareness of their emotional expressivity deficits[2].

Building on our observation of a strong correspondence between experiential domains (avolition, anhedonia) and a weaker correspondence in expressive domains (affective flattening), our results align with ecological momentary assessment studies, which demonstrate that motivational deficits are reliably self-reported in real-time[29]. In contrast, expressive deficits often go unrecognised by patients. This pattern is consistent with Berenbaum and Gur work, which shows that affective flattening reflects an ego-syntonic deficit, whereby patients perceive their reduced expressivity as normative rather than pathological[30,31]. Beyond these core findings, differences may also stem from metacognitive deficits—limited self-monitoring of emotional expression, as shown by multimodal dialogue systems—and neurobiological factors, such as amygdala hyperreactivity to unmasked fearful faces in affective flattening[32,33]. Temporally, defeatist performance beliefs

predict future negative symptom severity, highlighting the dynamic nature of subjective experiences.[34] Stigma may further lead patients to underestimate emotional symptoms. These convergent data underscore the need for multimodal assessment approaches that combine patient self-report for experiential symptoms with clinician or automated observation for expressive deficits.[35]

The SNS and m-SAND-N questionnaires provide clinicians with a rapid and low-cost method for capturing both experiential and expressive aspects of negative symptoms, eliminating the need for specialised equipment or extensive training. Unlike multimodal approaches that require video recording, automated speech analysis, or collateral informants, these brief self-report and clinician-administered scales can be completed within a typical outpatient visit, yielding actionable scores immediately. As a result, the routine use of SNS and m-SAND-N can enhance the detection of negative symptoms in resource-constrained settings, facilitate timely treatment adjustments, and streamline the monitoring of patient progress over time.

To address patients' limited insight into affective flattening, clinicians should complement self-report with brief observational tasks—such as standardised emotion elicitation exercises—and solicit collateral ratings from caregivers or staff, which have been shown to improve detection of expressive deficits compared to self-report alone. Training clinicians in structured emotion observation protocols can further enhance reliability without requiring complex technology, ensuring that ego-syntonic deficits do not go unnoticed.

This study's strengths include its multicentre design and dual assessment strategy, which employs both clinician-observed and patient-reported symptom measures, providing a comprehensive evaluation of symptoms that aligns with contemporary person-centred approaches. Our study is the first to align identical negative symptom domains across patient-reported and clinician-rated scales in a Central European cohort, thereby enabling direct comparison of subjective and objective assessments and revealing domain-specific discrepancies that have not been previously characterized in relation to functional outcomes.Nonetheless, several limitations should be acknowledged. The cross-sectional nature of the analysis restricts causal interpretations and precludes conclusions about symptom progression or long-term functional outcomes. Additionally, subjective self-report measures may be influenced by cognitive impairments, insight levels, or social desirability biases, which can potentially attenuate their accuracy. The explained variance in subjective symptoms (approximately 12 %) suggests the presence of additional unmeasured influences, such as mood or coping strategies, which warrant further investigation. Furthermore, the study sample primarily consisted of chronic, unemployed patients, which may have limited its generalizability to younger, recently diagnosed, or more functionally capable patient populations. Finally, despite rigorous training, some degree of clinician observer bias cannot be entirely ruled out, which may influence the consistency of clinician-rated assessments.

Conclusion

In conclusion, this study underscores the importance and clinical utility of integrating subjective patient-reported measures with clinician-rated assessments in evaluating negative symptoms of schizophrenia and their impact on psychosocial functioning. The strong correlations between objective and subjective assessments, as well as their association with functional outcomes, affirm that patient self-reports provide meaningful insights into the internal experiences of negative symptoms. Nevertheless, observed discrepancies, particularly in assessing affective blunting, underscore the need for clinicians to interpret subjective reports in the context of patient insight critically. Clinically, employing both subjective and objective measures enriches the assessment process, improves symptom recognition, and supports personalised, targeted interventions addressing both experiential and expressive negative symptom domains. Future research should further explore longitudinal trajectories, the influence of cognitive and insight-related factors on subjective assessments, and validate these findings in broader patient populations to refine assessment approaches and enhance patient-centred care in schizophrenia.

Ethical considerations

The study was approved by the Ethics Committee of the Košice Self-Governing Region (approval number: 3618/2020/ODDZ-07169). All procedures performed in this study were conducted in accordance with the ethical standards of the institutional research committee and with the Declaration of Helsinki. Written informed consent was obtained from all participants.

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Conflict of interest

The authors declare that they have no relevant financial or non-financial interests related to the preparation and submission of this manuscript.

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