Identification of the prodromes of psychosis in a population of psychiatric service users at their first contact: correlations between prodrome-specific and non-specific psychopathology scales and with socio-occupational functioning

Identificazione dei prodromi della psicosi in una popolazione di utenti di servizi psichiatrici al loro primo contatto: correlazioni tra scale di valutazione della psicopatologia prodrome-specifiche ed aspecifiche e con il funzionamento socio-lavorativo

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Summary

Background and Objectives

The Scale Of Prodromal Symptoms (SOPS) and its accompanying semistructured interview, the SIPS, have been developed to assess prodromal symptoms of psychosis. It has been correlated inversely with the Global Assessment of Functioning (GAF) in a number of studies, a DSM-IV-derived scale to assess personal, social and occupational functioning, which has been often shown to correlate inversely with general psychopathology, as assessed through the Brief Psychiatric Rating Scale (BPRS). Some items of the latter have been used in identifying at-risk cases in the past, but the SOPS and other screening tools for early detection of psychosis appear to be more specific at this respect. While the SOPS/SIPS are best complemented by the PANSS, the role of the BPRS at this respect has still to be assessed. We aimed to compare the Italian version of the SOPS with the BPRS in people at their first contact with a psychiatric service and to examine their concordance in inversely correlating with the GAF.

Methods

We collected sociodemographic and clinical data of 128 individuals seeking psychiatric help in a large Roman area, either as help-seekers at community facilities or as inpatients in psychiatric wards of two general hospitals (Table I). All included subjects were administered the Italian version of the SOPS, the Italian version of the 24-item BPRS, and the GAF. Data were analysed through Spearman's correlation and the non-parametric Mann-Whitney U-test.

Results

Scores on the Italian version of the SOPS correlated with those of the Italian version of the 24-item, expanded BPRS version, and both scales correlated inversely with GAF scores (Fig. 1). A higher proportion in the ultra-high risk group (UHR; n = 26) than in the clinically diagnosed aggregate group, composed of patients with established schizophrenia (SCHIZO), first episode psychosis (FEP), and other DSM-IV diagnoses (OTHER), were functionally impaired (GAF < 65). People in the UHR group scored higher on all SOPS scales and on all, but activity/excitement (EXC), BPRS scales (Table III). Compared to the clinical subsample, the UHR group showed fewer and weaker correlations betwixt the BPRS and SOPS and their scales. However, all SOPS dimensions correlated with total scores in the UHR group, but not in the combined clinical group (SCHIZO + FEP + OTHER). The BPRS and the SOPS revealed a "psychotic" and an "affective" pole, the former composed of the SOPS Positive, Negative, and Disorganisation scales and of the thought disorder, withdrawal, and hostility scales of the BPRS; only this pole showed inverse correlations with global functioning.

Conclusions

SOPS and BPRS are related dimensionally and conceptually. Clinical and preclinical psychopathologies correlate inversely with personal, social and occupational functioning in a first-contact population of psychological help-seekers. The UHR subsample differed from the clinical subsample in many respects and was more functionally impaired, thus it might represent a distinct, identifiable population, scoring higher on the SOPS and on the BPRS.

Key-words

Schizophrenia • Early diagnosis • First episode psychosis • At-risk mental states • Brief Psychiatric Rating Scale (BPRS) • Scale Of Prodromal Symptoms" (SOPS) • Global Assessment of Functioning (GAF) • Community mental health services

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Riassunto

Retroterra e obiettivi

La *Scale Of Prodromal Symptoms* (SOPS) e la relativa intervista semi-strutturata, la SIPS, sono state approntate per valutare i sintomi prodromici della psicosi. Essa è stata correlata inversamente in alcuni studi con la valutazione globale del funzionamento (VGF), una scala derivata dal DSM-IV che valuta il funzionamento personale, sociale e professionale, che si è visto spesso correlare inversamente con la psicopatologia generale valutata attraverso la *Brief Psychiatric Rating Scale* (BPRS). Qualche item di quest'ultima è stato utilizzato per identificare casi a rischio nel passato, ma la SOPS e altri strumenti di screening per la rilevazione precoce della psicosi sembrano più specifici al riguardo. Mentre la SOPS/SIPS è meglio affiancata dalla PANSS, il ruolo della BPRS non è stato indagato. Ci siamo prefissati di confrontare la versione italiana della SOPS con la BPRS in persone al loro primo contatto con un servizio psichiatrico e di esaminare la loro concordanza nel correlarsi inversamente con la VGF.

Metodi

Abbiamo raccolto dati sociodemografici e clinici di 128 persone richiedenti aiuto psichiatrico in un'ampia area romana, o come utenti di servizi territoriali o come pazienti ricoverati in reparti di due ospedali generali (Tab. I). Tutti i partecipanti sono stati sottoposti a valutazione attraverso la versione italiana della SOPS, la versione italiana della BPRS a 24-item e la VGF. I dati sono stati analizzati attraverso la correlazione di Spearman e il test non parametrico U di Mann-Whitney.

Risultati

I punteggi della versione italiana della SOPS si sono correlati con quelli della versione italiana espansa a 24 item della BPRS; ambedue le scale si sono correlate inversamente con i punteggi della VGF (Fig. 1). Una compromissione funzionale (VGF < 65) è stata evidenziata in una più alta percentuale del gruppo ad alto rischio (UHR; n = 26) che nel gruppo aggregato con diagnosi cliniche, composto da pazienti con schizofrenia stabilizzata (SCHIZO), con psicosi al primo episodio (FEP) e altre diagnosi DSM-IV (ALTRO). Le persone del gruppo UHR hanno ottenuto punteggi più alti su tutte le scale della SOPS e su tutte le scale della BPRS ad eccezione della scala attività/eccitamento (EXC) (Tab. III). A confronto con il sotto campione clinico, il gruppo UHR ha evidenziato meno correlazioni e meno forti tra la BPRS e la SOPS e tra le loro singole scale. Tuttavia, tutte le dimensioni della SOPS si sono correlate con i punteggi totali nel gruppo UHR, ma non nel gruppo clinico aggregato (SCHIZO + FEP + ALTRO). La BPRS e la SOPS hanno svelato un polo "psicotico" ed uno "affettivo", il primo composto dalle scale SOPS Positiva, Negativa e Disorganizzativa e dalle scale del disturbo del pensiero, dell'isolamento/ritiro e dell'ostilità della BPRS; solo questo polo ha evidenziato correlazioni inverse con il funzionamento globale.

Conclusioni

La SOPS e la BPRS sono dimensionalmente e concettualmente correlate. Le psicopatologie clinica e preclinica si sono correlate inversamente con il funzionamento personale, sociale e professionale in una popolazione al primo contatto con un servizio psichiatrico. Il sottocampione UHR differiva da quello clinico in molti aspetti e registrava una maggiore compromissione funzionale, quindi potrebbe rappresentare una popolazione distinta, identificabile, che registra punteggi più alti sulla SOPS e sulla BPRS.

Parole chiave

Schizofrenia • Diagnosi precoce • Psicosi al primo episodio • Stati mentali a rischio • *Brief Psychiatric Rating Scale* (BPRS) • *Scale Of Prodromal Symptoms* (SOPS) • Valutazione Globale del Funzionamento (VGF) • Servizi territoriali di salute mentale

Introduction

There is increasing awareness that schizophrenia [1], bipolar disorder [2], and possibly other psychoses [3], are neurodevelopmental processes. The prodrome concept of the psychoses developed in Germany in the mid-sixties, based on the observation that patients with schizophrenia had "basic" symptoms, i.e., soft, subthreshold symptoms, suggesting imperfect development, for some time before psychotic outbreak [4]. However, other models, like the neurodegenerative, have not been definitely ruled-out, and may be compatible with defects in neurodevelopment [5], in that an unsupportedly deployed structure is amenable to regression. Deterioration is a time-related, progressive phenomenon that deteriorates the brain, and this is what is actually found in schizophrenia [6]. Whether the arrest of such progression is feasible through early treatment is a matter of speculation, but should this be the case, early identification would become mandatory.

Early identification of people with at-risk mental state for psychosis would allow reducing duration of untreated psychosis (DUP), which has been found to be associated with worse outcome [7] and help establishing timely treatment and follow-up of these people. The development of early intervention services would provide specifically dedicated care available for people at risk; such centres are now developing throughout the world, contributing to the reduction of healthcare costs of people with schizophrenia [8-10]. Reduction of DUP or avoiding transition/conversion to psychosis im-

proves outcome; this suggests that it is useful to be able to predict transition of some prodromal state to psychosis; to this end, appropriate rating scales have to be developed or already developed scales have to be used taking care to increase the detection power of at-risk mental states.

Several approaches to the assessment of the at-risk mental state have been developed in recent years in various countries. These comprise interviews and scales variably focusing on early and late prodromes of psychosis. The basic symptoms approach, rooted in the classical German tradition, focuses more on earlier prodromes. This approach is represented by the Bonn Scale for the Assessment of Basic Symptoms (BSABS) [11], by the Early Recognition Inventory (ERIraos) [12], which derives from the retrospective reconstruction of the prodromes of already diagnosed people using the Interview for the Retrospective Assessment of the Onset of Schizophrenia (IRAOS) [13 14] and is currently under validation in Germany, France, Italy and Israel, and by the Schizophrenia Proneness Instrument-Adult Version [15] (SPI-A; a version for children and adolescents, SPI-CY, is now almost ready).

The so-called "attenuated positive symptoms approach" focuses more on the late antecedents of psychotic outbreak and comprises the Basel Screening Instrument for Psychosis (BSIP) [16], the Comprehensive Assessment of At Risk Mental States (CAARMS) [17], developed in the PACE Clinic (Personal Assessment and Crisis Evaluation) (Melbourne, Victoria, Australia) and used also in other countries, and the Structured Interview for Prodromal Syndromes (SIPS)/Scale Of Prodromal Symptoms (SOPS) [18 19], developed in the PRIME (Prevention through Risk Identification, Management and Education) Clinic at Yale, Connecticut, USA, and used at various PRIME Clinic sites in North America and in Europe.

Self-rating scales comprise a 92-item questionnaire, with positive, negative, and affective questions modelled on the CAARMS, the Youth Psychosis at Risk Questionnaire (Y-PARQ) [20], suitable for school and telephone interview screening, the 92-item Prodromal Questionnaire, that was administered conjointly with the SIPS in one study [21], and the PROD-screen [22], with a mixed, basic symptoms-attenuated positive symptom approach, incorporating items from the BSABS, the IRAOS, and the SOPS; the PROD-screen is a 21-item tool that can be administered either as an interview with the patient or by telephone or self-rated.

Both Australian and American groups use the same terminology for defining ultra high-risk (UHR) mental states. They subdivide into Attenuated Psychotic Symptom group (APS), brief limited intermittent psychotic symptoms (BLIPS), and genetic risk (trait)/deterioration (state) group. The Melbourne group used APS and BLIPS criteria that involved items of the Brief Psychiatric Rating Scale (BPRS) [23 24] along with the delusion item of the Comprehensive Assessment of Symptoms and History (CASH) [25], and a criterion of ≥ 30% GAF drop in the last year for state/trait vulnerability group [26], but also developed other criteria in the CAARMS [17]. The approaches to the at-risk state early identification are heterogeneous, and various mixed approaches may be used to increase predictivity of conversion/transition to psychosis. Such an approach is currently used in London by OASIS (Outreach And Support In South London), combining elements of the CAARMS and the SPI-A [27]. The SOPS has a good item correspondence with the Positive and Negative Syndrome Scale [28] (PANSS); the two instruments are used conjointly to assess at-risk state in the European EPOS study [29]. The comparative effectiveness of the SIPS/SOPS in detecting high-risk mental states has received only limited investigation heretofore, and the convergence between its items and those of the BPRS has not been reported.

We recently carried-out a factorial analysis on the Italian version of the SOPS, translated by L. Conti (provided upon request to the translator and authors), and obtained a similar factor-structure with the original American version [30] and with the only other factorialisation of the SOPS, that was carried-out in Spain [31]. We conducted factorialisation on the same 128 people that constituted the population of the current study and showed convergent validity with the original version [32].

Aims In this study, we aimed to analyse the relationships between the SOPS and the BPRS scales and of each of the two with the GAF, to assess the validity of the former in screening for psychosis in patients at their first psychiatric contact, as well as the role of socio-occupational functioning in those people who were classified with an at-risk mental state after initial screening.

Materials and methods

Sample and catchment area

This study has been carried-out on 128 people consecutively recruited in the ASL Roma E area during a 12-month period. Data collection was part of a prospective clinical study aiming at addressing prevention of psychiatric conditions.

Inclusion and exclusion criteria

All recruited people ranged from 15 to 30 years of age, with the cut-off being ≤ 30 years. People were recruited from inpatient and outpatient psychiatric settings of an extended North-Roman area, with a total population of about half-a-million residents. People with mental disorders from these areas referred to seven mental health services. This area extends to 948 km^2 and is characterised by the presence of one university and two general hospitals; of the latter, only one contributed cases. All psychiatric centres adopted the same methods.

Included patients met the following:

a. first contact with psychiatric services;
b. capacity to communicate with the interviewer and to understand the nature of the study;
c. age less than 30 years;
d. written informed consent.

All participants underwent a structured interview for the collection of historical, socio-demographic, and clinical data; the psychiatrists were asked to classify patients in four diagnostic subgroups according to their risk for developing psychosis.

Group 1 included patients with DSM-IV stabilised schizophrenia, group 2 included those at their first episode and fulfilled DSM-IV criteria for schizophreniform disorder. Group 3, which was termed ultra-high risk (UHR), included people meeting the Yung et al. [33] criteria for at-risk mental state. Group 4 comprised all patients with other psychiatric conditions.

Psychometric instruments

SOPS (Scale of the Prodromal Symptoms). A clinician-rated scale to evaluate prodromal symptoms, developed by Thomas McGlashan, the late Tandy Miller and other collaborators at Yale, New Haven, CT, USA [18], it is based on a 19-item semi-structured interview, the SIPS (Structured Interview for Prodromal Syndromes), which described prodromal and other symptoms experienced in the last month. The scale is organised in four primary scales, a Positive Symptom (P), a Negative Symptom (N), a Disorganisation (D), and a General Symptom scale (G). For a detailed description of the SOPS and its aims, contact the translator and/or authors.

BPRS (Brief Psychiatric Rating Scale). A scale developed by John Overall and David Gorham during the early sixties [23] to rate general psychopathology. Initially it was a 16-item tool, but soon two items were added [24]; the 18-item version has been the most extensively used psychiatric scale. Recently, aside to versions addressed to specific populations, a 24-item has been prepared [34]. This has been translated in Italian and validated [35]. Each item is rated on a Likert scale ranging from 1 = symptom absent to 7 = very severe. The higher the score, the greater the severity.

The subscales of the 24-item version of the BPRS are Thought Disorder (THOT), Withdrawal (WITH), Anxiety/Depression (ANXD), Activity/Excitement (EXC), and Hostility/Suspiciousness (HOST) [36].

Global Assessment of Functioning (GAF). It is extracted from page 32 of the DSM-IV-TR [37] and is universally employed to assess the patient's global functioning. High scores show good functioning, while scores lower than 30 are almost incompatible with independent life. An important measure often considered is the percent drop from previous score during the last 12 months; a steep drop sometimes heralds psychotic onset.

Statistical analysis

Differences in sociodemographic and clinical variables between the various sites and the groups of persons referring to the various services were investigated through Fisher's exact test.

Correlations between total scores on the BPRS and the SOPS, on the BPRS and the GAF, and on the SOPS and the GAF, as well as on the items composing the subscales of the 24-item BPRS and those obtained on the four subscales of the SOPS, and also between each of these subscales with the total GAF scores, were sought with Spearman's non-parametric *rho* (ρ) test. Differences in the medians of these scales between the UHR group and the other three groups were analysed through the non-parametric Mann-Whitney U-test.

Interrater reliability has been examined for the SOPS on the basis of 15 consecutive interviews of people aged 18-30 years (mean, 26.5 years). Raters

were two psychiatrists (AC and VS) trained in the use of the SOPS, who provided independently their ratings. The comparison has been carried-out after the raters had completed all ratings. We used Cohen's kappa to measure reliability between the two raters.

Results

Sample description

There were 46 men and 82 women included in the sample (male-to-female ratio, 1/1.78); mean age was 22.98 years (standard deviation [DS], 4.3 years). Sociodemographic sample characteristics are shown in Table I.

Clinical description of the sample

At the end of the interview, all people at their first contact with a psychiatric service received a diagnosis or no diagnosis. This allowed us to classify them into four diagnostic subgroups, i.e., diagnosis of schizophrenia according to the DSM-IV-TR (SCHIZO; 3 patients, 2.3%), first-episode psychosis (FEP; 4 patients, 3.1%), ultra-high risk for psychosis (UHR; 26 people, 20.31%), and other psychiatric diagnoses (OTHER; 52 patients, 40.6%) and one non-diagnostic group (ND; 43 people, 33.6%). The OTHER subgroup was composed of patients with mood disorders (14 patients, 26.9% of the subgroup), anxiety disorders (13 patients, 25% of the subgroup), personality disorders (13 patients, 25% of the subgroup), eating disorders (9 patients, 17.3% of the subgroup) and other diagnoses like Tourette's, pervasive developmental or body dysmorphic disorder (3 patients, 5.8% of subgroup).
The distribution of SOPS items in the entire sample (n = 128) showed that most subjects scored low on most items (symptoms) (means ranged from 0.53 on P3 to 2.3 of G2). In UHR, means ranged from 0.54 on D4 to 3.15 on G2 (Table II).

TABLE I.
Sociodemographic characteristics of the sample (n = 128). *Caratteristiche sociodemografiche del campione (n = 128).*

	Male n = 46 (%)	Female n = 82 (%)	Total n = 128 (%)
Age			
Mean	22.57	23.21	22.98
Standard deviation	3.8	4.15	4.03
Marital status (%)			
Unmarried	100%	91%	95%
Married/divorced/widowed	0%	9%	5%
Educational level			
No education	0	1 (1.4%)	1 (0.78%)
Primary school	0	1 (1.4%)	1 (0.78%)
High school	12 (30%)	21 (28.4%)	33 (25.78%)
College	26 (65%)	39 (52.7%)	65 (50.78%)
Professional training	1 (2.5%)	5 (6.8%)	6 (4.69%)
Graduate	1 (2.5)	7 (9.5%)	8 (6.25%)
Fisher's exact test, p = 0.65, not significant (NS)			
Occupation			
Working	9 (23.7%)	29 (39.7%)	38 (29.69%)
Unemployed	7 (18.4)	10 (13.7%)	17 (13.28%)
In search for first job	1 (2.6%)	3 (4.1%)	4 (3.125%)
Part-time	3 (7.9%)	5 (6.8%)	8 (6.25%)
Student	18 (47.4%)	26 (35.6%)	44 (34.375%)
Fisher's exact test, p = 0.11			

TABLE II.
Mean scores on each SOPS item in our sample (n = 128). *Punteggi medi di ogni item della SOPS nel nostro campione (n = 128).*

SOPS item	Mean	Standard Deviation
P1	0.766	1.42
P2	1.039	1.51
P3	0.531	1.03
P4	0.461	1.18
P5	0.547	1.22
N1	1.555	1.63
N2	1.172	1.49
N3	1.180	1.42
N4	0.977	1.37
N5	0.680	1.22
N6	1.516	1.66
D1	0.562	1.18
D2	0.633	1.26
D3	0.891	1.38
D4	0.539	1.05
G1	1.305	1.43
G2	2.336	1.46
G3	0.766	1.20
G4	1.789	1.44

P: positive; N: negative, D: disorganised; G: general; for an explanation of each item, please refer to Appendix.

Comparing with the Mann-Whitney U-test the UHR group *versus* all other groups (SCHIZO plus FEP plus OTHER) on the SOPS scales, we found the medians of the former group to be significantly lower than those of the combined group on the GAF, and significantly higher on all SOPS and BPRS subscales, except for the BPRS activity/excitement subscale (Table III).

People in the UHR group scored significantly higher also on the G2 item of the SOPS, i.e., dysphoric mood, with respect to the combined SCHIZO, FEP and OTHER group (means of 3.15 and 2.095, SD = 1.434 and 1.369, respectively) and also on N1 (social anhedonia) and D2 (bizarre thinking). Furthermore, scores on the GAF were significantly lower in the UHR group ($p < 0.025$). In line with others [38 39], we considered 65 as the lower cut-off for normal global functioning. We found 15 people out of 26 in the UHR group to have poor social and occupational functioning (60%), while 18 of the 61 people in the combined group for which a GAF score was available fell in the same poor functioning category (29.5%). However, a statistical comparison between these figures is not feasible, due to many missing data.

Correlations betwixt scores on the SOPS, on the BPRS, on their subscales and on the GAF. We used Spearman's ρ to assess correlations between each scale and each subscale. We found mean scores on the SOPS items and the total BPRS scores to correlate strongly, while somewhat weaker, but still significant correlations were found also between the same two measures and total GAF scores (Fig. 1).

The total scores on the three scales per group, i.e., UHR and SCHIZO plus FEP plus OTHER, correlated similarly, but with differing strength (Fig. 2). Examining the same correlations in the two subpopulations, i.e., UHR and aggregate SCHIZO plus FEP plus OTHER, the BPRS and the SOPS correlated significantly in both UHR and aggregate groups, but the correlation in the latter was stronger (Spearman's $\rho = .425$, $p < .05$; and $\rho = .835$, $p < .001$, respectively). In the UHR group, the SOPS, but not the BPRS, correlated inversely with the GAF (Spearman's $\rho = .-.618$, $p < .01$ between SOPS and GAF, and $\rho = .-.25$, $p = .227$, NS between BPRS and GAF). In the SCHIZO plus FEP plus OTHER group, both psychopathology scales correlated inversely significantly at a $p < .01$ level with the GAF (Spearman's $\rho = .-.474$, $p < .01$ between SOPS and GAF, and $\rho = .-.504$, $p < .01$ between BPRS and GAF). Thus, the inverse correlations with the GAF of the psychopathological scales were dissociated in the two groups; the SOPS, the prodromal, risk-evaluation, psychopathological scale, correlated inversely with the GAF in both the at-risk and the clinical population (and more so in the former). On the other hand, the BPRS, the clinical psychopathological scale, correlated inversely with the GAF only in the clinical, but not in the at-risk population. In the clinical population, the inverse correlation between BPRS and GAF was stronger than the inverse correlation between the SOPS and the GAF. These correlations are compared in Figure 2.

Correlations between subscales of the SOPS and of the BPRS and total GAF scores. The strongest

TABLE III.
Comparisons on the Mann-Whitney between the UHR and the other three diagnostic groups for scores on the individual SOPS and BPRS subscales and on the GAF. *Confronti tra soggetti ad alto rischio e gli altri tre gruppi diagnostici per i punteggi delle sottoscale della SOPS e della BPRS e della VGF analizzati con il test U di Mann-Whitney.*

	UHR			SCHIZO, FEP, OTHER			Mann-Whitney's U	Asymptotic significance (two-sided) p
	Median	25th centile	75th centile	Median	25th centile	75th centile		
SOPS P	7	5	9	0	0	2	363	0.000
SOPS N	13.5	8	17	4	0	10	385	0.000
SOPS D	4	2	8	0	0	2	421.5	0.000
SOPS G	8	6	12	6	3	9	507	0.004
GAF	60	45	70	70	61	75	496	0.011
BPRS THOT	9	7	11	5	5	6	420.5	0.000
BPRS WITH	8.5	6	10	4	4	6.5	453.5	0.001
BPRS ANXD	16	13	22	14	10	17	566	0.018
BPRS EXC	6.5	4	8	5	4	7	665.5	0.125 NS
BPRS HOST	10.5	9	13	6	5	9	407	0.000

NS: not significant.

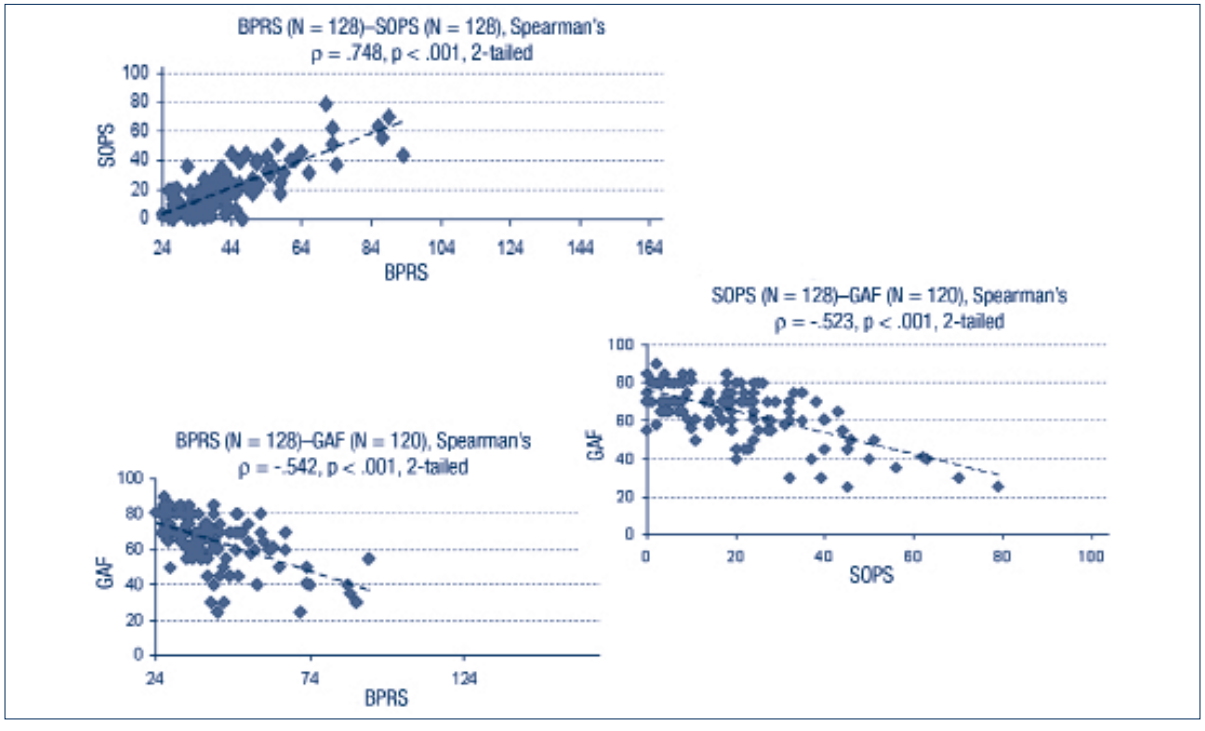

FIGURE 1.
Pairwise correlations betwixt total BPRS, SOPS, and GAF scores. *Correlazioni a coppie tra punteggi totali della BPRS, della SOPS e della VGF.*

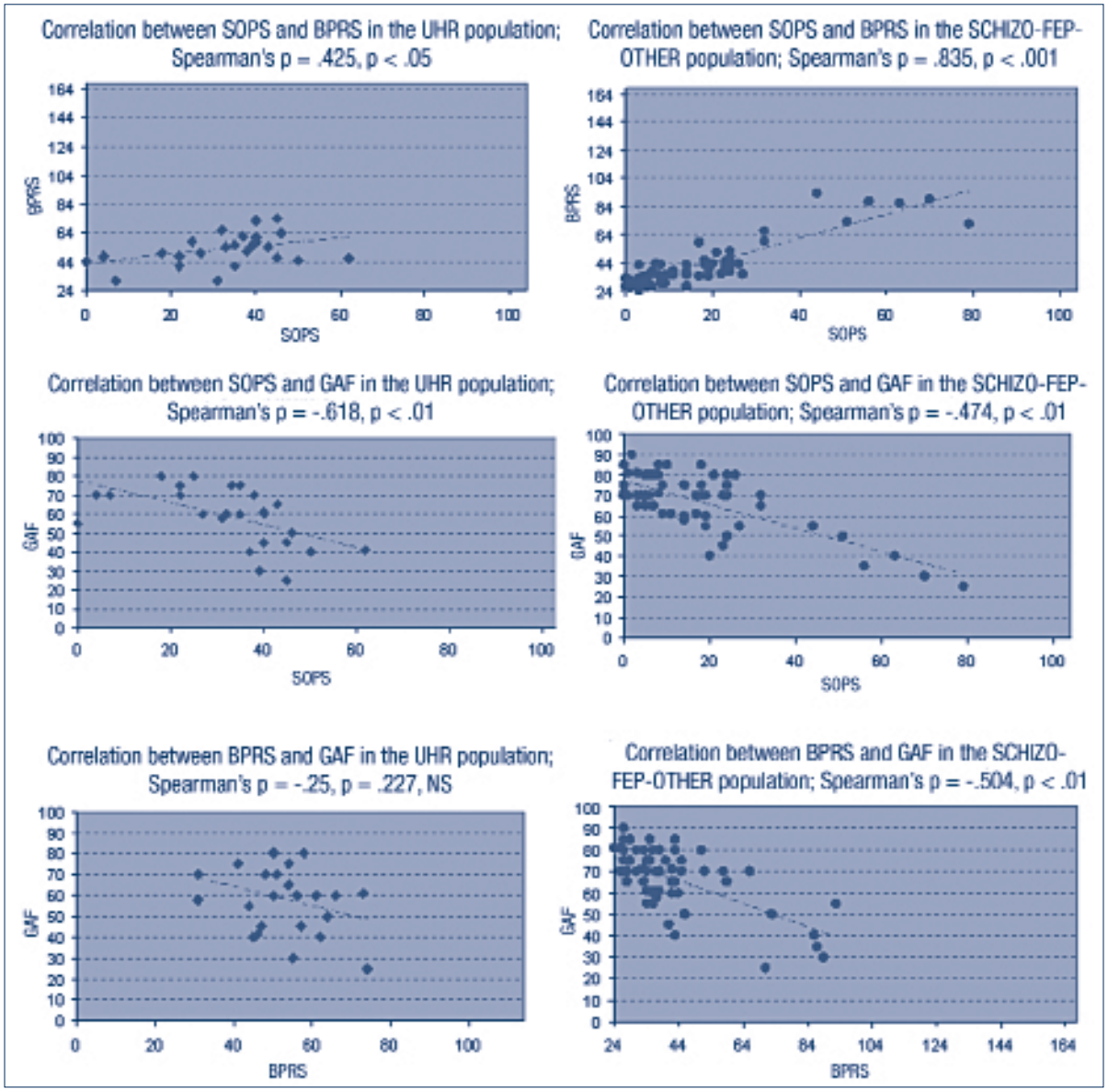

FIGURE 2.
Comparison of correlations obtained in the UHR (n = 26) and the cumulative SCHIZO, FEP, and OTHER group (n = 64) betwixt SOPS, BPRS, and GAF (total scores). *Confronti a coppie tra SOPS, BPRS e VGF (punteggi totali) delle correlazioni ottenute nel gruppo ad alto rischio (n = 26) e il gruppo aggregato SCHIZO, FEP e ALTRO (n = 64).*

correlations were observed between the scores on the THOT scale of the BPRS on one hand and the P and D scales of the SOPS on the other.
Besides the THOT scale of the BPRS, the SOPS Positive and Disorganisation scales showed moderate correlations with the WITH and HOST scales of the BPRS. The Negative scale of the SOPS showed moderate correlations with all BPRS scales, except with the excitement-activity scale (EXC). The General subscale of the SOPS, on the other hand, showed to be correlated moderately only with the ANXD and EXC scales of the BPRS. The two assessment scales showed cross-content validity of their subscales.
Both scales correlated inversely with GAF total scores (high scores on the GAF indicate good

TABLE IV.
Correlations between the four SOPS subscales and the five BPRS subscales (Spearman's rho values). *Correlazione tra le quattro sottoscale della SOPS e le cinque della BPRS (valori della rho di Spearman).*

			BPRS				
			THOT	WITH	ANXD	EXC	HOST
SOPS	P	Correlation coefficient	.789**	.414**	.306**	.310**	.590**
		Significance (two-tailed)	.000	.000	.000	.000	.000
		N	128	128	128	128	128
	N	Correlation coefficient	.523**	.585**	.428**	.385**	.516**
		Significance (two-tailed)	.000	.000	.000	.000	.000
		N	128	128	128	128	128
	D	Correlation coefficient	.676**	.438**	.324**	.317**	.532**
		Significance (two-tailed)	.000	.000	.000	.000	.000
		N	128	128	128	128	128
	G	Correlation coefficient	.241**	.211*	.562**	.403**	.367**
		Significance (two-tailed)	.006	.017	.000	.000	.000
		N	128	128	128	128	128

* p < 0.05 (two-tailed); ** p < 0.01 (two-tailed).

TABLE V.
Correlations between scores on the GAF and on BPRS and SOPS subscales (Spearman's rho values). *Correlazioni tra i punteggi della GAF e delle sottoscale della BPRS e della SOPS (valori della rho di Spearman).*

		BPRS					SOPS			
		THOT	WITH	ANXD	EXC	HOST	P	N	D	G
GAF	Correlation Coefficient	-.486**	-.446**	-.251**	-.243**	-.562**	-.362**	-.513**	-.447**	-.284**
	Significance (two-tailed)	.000	.000	.006	.007	.000	.000	.000	.000	.002
	N	120	120	120	120	120	120	120	120	120

** p < 0.01 (two-tailed).

functioning); the Negative and the Disorganisation scales of the SOPS showed moderate inverse correlations with total GAF scores, similarly to the BPRS THOT, WITH, and HOST scales.

Correlations showing Spearman's ρ values are shown in Tables IV-V.

Correlations of SOPS and BPRS subscales with SOPS, BPRS, and their subscales, as well as with the total GAF scores within the groups UHR and SCHIZO + FEP + OTHER are shown in Table VII. It is immediately apparent that fewer and smaller correlations were present in the UHR group, as compared with the clinical population, in which most correlations were high and regarded all but some few pairs of measures, namely, between SOPS G on one hand, and each of BPRS THOT, WITH, and total GAF scores on the other, whereas a trend was present for the pair SOPS P and SOPS G, that behaved likewise also in the UHR group.

The UHR showed fewer correlations; each SOPS scale correlated with the sum of all SOPS scales, as expected; all correlations were at the p < .001 level, except the one for the SOPS G, that was significant at the p < .01 level; furthermore, all SOPS scale correlated inversely with the GAF at

the $p < .05$ level. SOPS P correlated with the D scale within the SOPS, and with the THOT and HOST scales of the BPRS. Like the former, SOPS N correlated with the D scale of the SOPS, but differently from SOPS P, it correlated with the total BPRS scores and only with BPRS WITH. SOPS D correlated with SOPS P and N, but not SOPS G; it correlated with BPRS THOT. The SOPS G showed trends for correlations with the SOPS P and N, and also for the BPRS HOST, while it correlated only with total BPRS scores. The BPRS THOT in the UHR group, besides not correlating significantly with total BPRS scores (possibly due to the smaller trend occurring between it and the HOST subscale), correlated significantly with the SOPS P and D, and the other BPRS scales (WITH, ANXD, and EXC), while it correlated inversely with the total GAF scores, which in turn correlated inversely with the HOST, but not with other BPRS scales in this group. The WITH scale correlated only with SOPS N, with BPRS THOT, and with total BPRS scores. BPRS ANXD and EXC correlated only with BPRS total scores and BPRS THOT in the UHR group, while the BPRS HOST correlated significantly only with the SOPS P and, inversely, with the GAF, while it showed trends also for the SOPS G and for BPRS total scores and BPRS THOT (Table VI).

Inter-rater reliability. Using 0.05 as the alpha cut-off, we used Cohen's *kappa* to assess interrater reliability for each SOPS and BPRS item and for total scores. The lowest concordance we obtained was 0.902 (item P4 of the SOPS, "Perceptual Abnormalities/Hallucinations"). All other values were 0.99 or higher. Overall, interrater reliability for the SOPS was very high (Cohen's *kappa* = 0.91, $p < .0001$).

Discussion

In a 12-month study conducted in a large Roman area, we correlated scores obtained by 128 individuals at their first contact with psychiatric services on the Italian version of the SOPS and its scales with the expanded 24-item Italian version of the BPRS [35] and its scales, and with those obtained on the GAF. The SOPS is a scale developed to identify and measure prodromal symptoms and states, while the BPRS is a general psychopathology scale particularly apt to measure psychosis; the GAF is a global functioning scale embedded in the DSM-IV-TR. Each psychopathological scale showed significant correlations between its various scales with the scales of the other, thus evidentiating construct validity and convergent validity in a psychological help-seeking population. The scores on the subscales of both scales correlated inversely with total GAF scores, indicating poor social and occupational functioning in people with an at-risk mental state or with manifest psychosis. However, differences in the behaviour of the two psychopathological scales were observed according to the subpopulation involved, i.e., at-risk mental states *vs*. clinically ill people.

In our sample, the female gender was preponderant (almost two female individuals for each male), but mean age between the two genders did not differ. This could possibly reflect a change in the trends of expression of psychological needs. Since schizophrenia and other psychoses, like bipolar disorder, have an earlier onset and higher (at least in the 15-26 year range) incidence in male individuals [40 41], we would have expected a higher affluence of male individuals in psychiatric services seeking psychiatric help for the first time in their life. Our 12-month female-to-male gender ratio of first contact psychological help-seekers was higher than the 24-month ratio British sample reported by Lloyd et al. [42], who found a fifty-fifty ratio in an ethnically heterogeneous population, but similar to that of another Italian psychiatric service [43], which is ethnically similar to ours. Despite bipolar disorder is more frequent in women than in men, its incidence in earlier age ranges, like youths and young adults, is higher in males. In Kennedy's et al. [41] sample, among people aged 16-25 who presented with first-episode bipolar disorder there were more men than women, while in the 26-35 range the trend was inverted. However, in our sample, the proportions of genders were fairly consistent across age ranges (supplementary online file); however, our only three cases of bipolar disorder were women, two in the 24-31 year range and one in the 15-23 range. Incidence was too low to allow reliable statistics. Given the age range of our population, it is no surprise that most people in our sample were unmarried; however, all married individuals were women. This should indicate better premorbid adjustment in women in this age range, and in fact,

TABLE VI.
Correlations betwixt SOPS and BPRS subscales with each other and GAF total scores in the UHR and combined SCHIZO, FEP, and OTHER groups. *Correlazioni tra le scale della SOPS e della BPRS e con i punteggi totali della VGF nei gruppi ad alto rischio (UHR) e aggregato (SCHIZO, FEP ed ALTRO).*

		UHR (n = 26)		SCHIZO + FEP + OTHER (n = 64)	
		Spearman's ρ	P	Spearman's ρ	p
SOPS P	SOPS	.669	**< .001**	.598	**< .001**
	SOPS N	.283	.162, NS	.474	**< .001**
	SOPS D	.754	**< .001**	.573	**< .001**
	SOPS G	.361	*.07, NS*	.23	*.067, NS*
	BPRS	.325	.105, NS	.691	< .001
	BPRS THOT	.547	**< .05**	.778	**< .001**
	BPRS WITH	-.023	.91, NS	.592	**< .001**
	BPRS ANXD	.128	.534, NS	.496	**< .001**
	BPRS EXC	-.026	.898, NS	.414	**< .002**
	BPRS HOST	.399	**< .05**	.598	**< .001**
	GAF	-.396	**< .05**	-.285	**< .05**
SOPS N	SOPS	.747	**< .001**	.909	**< .001**
	SOPS D	.45	**< .05**	.667	**< .001**
	SOPS G	.361	*.07, NS*	.506	**< .001**
	BPRS	.494	**< .02**	.702	**< .001**
	BPRS THOT	.178	.384, NS	.514	**< .001**
	BPRS WITH	.586	**< .02**	.473	**< .001**
	BPRS ANXD	.246	.226, NS	.608	**< .001**
	BPRS EXC	.301	.136, NS	.475	**< .001**
	BPRS HOST	.084	.816, NS	.571	**< .001**
	GAF	-.398	**< .05**	-.5	**< .001**
SOPS D	SOPS	.78	**< .001**	.751	**< .001**
	SOPS G	.11	.591, NS	.307	**< .02**
	BPRS	.239	.24, NS	.667	**< .001**
	BPRS THOT	.443	**< .05**	.579	**< .001**
	BPRS WITH	.228	.262, NS	.485	**< .001**
	BPRS ANXD	.124	.548, NS	.524	**< .001**
	BPRS EXC	-.145	.479, NS	.454	**< .001**
	BPRS HOST	.196	.337, NS	.548	**< .001**
	GAF	-.463	**< .05**	-.347	**< .01**
SOPS G	SOPS	.528	**< .01**	.715	**< .001**
	BPRS	.393	**< .05**	.57	**< .001**
	BPRS THOT	-.125	.542, NS	.198	.117, NS
	BPRS WITH	.123	.549, NS	.128	.314, NS
	BPRS ANXD	.316	.115, NS	.594	**< .001**

(continued)

TABLE VI *(continued).*
Correlations betwixt SOPS and BPRS subscales with each other and GAF total scores in the UHR and combined SCHIZO, FEP, and OTHER groups. *Correlazioni tra le scale della SOPS e della BPRS e con i punteggi totali della VGF nei gruppi ad alto rischio (UHR) e aggregato (SCHIZO, FEP ed ALTRO).*

		UHR (n = 26)		SCHIZO + FEP + OTHER (n = 64)	
		Spearman's ρ	P	Spearman's ρ	p
	BPRS EXC	.165	.42, NS	.387	**< .005**
	BPRS HOST	.367	*.065, NS*	.301	**< .02**
	GAF	-.443	**< .05**	-.192	.138, NS
BPRS THOT	BPRS	.384	*.053, NS*	.726	**< .001**
	BPRS WITH	.454	**< .05**	.481	**< .001**
	BPRS ANXD	.559	**< .01**	.462	**< .001**
	BPRS EXC	.519	**< .01**	.426	**< .001**
	BPRS HOST	.361	*.07, NS*	.603	**< .001**
	GAF	-.08	.705, NS	-.463	**< .001**
BPRS WITH	BPRS	.454	**< .05**	.574	**< .001**
	BPRS ANXD	.378	*.057, NS*	.305	**< .02**
	BPRS EXC	.198	.333, NS	.452	**< .001**
	BPRS HOST	-.14	.495, NS	.473	**< .001**
	GAF	.125	.552, NS	-.465	**< .001**
BPRS ANXD	BPRS	.559	**< .01**	.813	**< .001**
	BPRS EXC	.176	.391, NS	.502	**< .001**
	BPRS HOST	-.16	.436, NS	.446	**< .001**
	GAF	.046	.826, NS	-.277	**< .05**
BPRS EXC	BPRS	.519	**< .01**	.694	**< .001**
	BPRS HOST	.074	.72, NS	.599	**< .001**
	GAF	-.043	.839, NS	-.269	**< .05**
BPRS HOST	BPRS	.361	*.07, NS*	.76	**<.001**
	GAF	-484	**< .02**	-.482	**<.001**

NS: not significant. Significant results in bold characters, trends in italics.

three as many women had a job, as compared to men (Table I).

We conducted our investigation in different types of services, ranging from inpatient wards for acute care to outpatient facilities in general or university hospitals and community Mental Health Centres. This may help explaining why only 20% of our first-contact psychological help-seekers received a diagnosis of at-risk mental state. However, it should also be emphasised that both first-episode psychoses and established schizophrenia were below 5%. Since most recruiting centres were not specialised centres for youths, they recruited cases with various psychiatric disorders, constituting about 40% of the entire sample. Similarly impressive is that 33% of first-contact psychological help-seekers had no diagnosis formulated; we may hypothesise that diagnosis were either postponed or that these service users were free from current psychiatric disorders; non-specialised psychiatric services often deal with non-specific psychological distress.

It may appear quite unexpected that the UHR sample scored higher than the clinical sample on all SIPS dimensions and on the expanded BPRS (Table III). However, it should be recalled that the

clinical sample was heterogeneous and comprised only few FEP and established schizophrenia cases that could have increased the scores of psychotic items. Another factor may be treatment, to which some people with clinical conditions were subjected, while UHR cases were not. In fact, there have been reports that untreated UHR samples were more severely ill than treated FEP samples [44 45]. One might wonder how people at their first contact ever with a public psychiatric service received psychiatric treatment; it should be said that some people in the clinical sample were seen in private practice and actually received psychotropic medications.

Our correlations analysis showed that all four scales of the SOPS are consistent with the entire scale and converge with BPRS scales. Among the latter, in our sample, it was THOT that proved to constitute a core scale; this scale correlated with the most strongly psychotic scales of the SOPS, i.e., with the SOPS P and the SOPS D in both the UHR and SCHIZO-FEP-OTHER groups. In the latter, it correlated also with all others very significantly (Table VII). It is possible that transition from a high-risk state into a clinically significant psychological disorder may involve a better matching between the two scales, i.e., the prodromal scale fits better in the UHR population and the BPRS increases its operationalisation when a full-blown disorder develops. Anyhow, the cases identified by the SIPS/SOPS instrument as UHR, constitute a population of their own, with significant functional impairment. It is also interesting that functional impairment correlates with SOPS scales, but with only one BPRS subscale (HOST) in the UHR population, while all BPRS scales correlate strongly with functional impairment in the clinical subsample. This indicated that SOPS is for the UHR and BPRS for clinical samples. This notion receives further support by the fact that the general scale of the SOPS correlated inversely with GAF only in the UHR and not in the clinical sample. However, differences in sample size could have been responsible for the obtaining many correlations in the clinical sample and less in the UHR group (the latter was less than half in size).

The D scale here showed construct validity and powerfully correlated with thought disorder (BPRS THOT) in both at-risk and clinical samples. It is curious that in all factorial analyses heretofore carried-out [30-32] the disorganised factor spread over other factors, i.e., positive, negative, and general. The consistency of this factor should be further tested.

The correlation betwixt subscales of the 24-item, expanded version of the BPRS [36] with the four SOPS scales and the inverse correlation of these scales and subscales with GAF scores has confirmed the convergence between the above psychometric tools and their reciprocity with the global functioning measure, that includes personal, occupational, and social functioning of the individual. Overall, both BPRS and SOPS behaved similarly towards the GAF.

However, at a closer look, we may observe that the stronger correlations (Spearman's ρ values between .6 and .79) were obtained between each of the SOPS P and D, i.e., the positive symptom and the disorganisation scales of the SOPS, and the thought disorder subscale of the BPRS (THOT). The latter correlated also with the negative subscale N of the SOPS (although only moderately, with values between .4 and .59), while it did not correlate with the general subscale G of the SOPS. This further underlines the centrality of thought disorder in psychoses, as it is a core feature, detected by both prodromal and current psychopathology scales. On the other hand, the G subscale of the SOPS correlated moderately only with the anxiety/depression (ANXD) and activation/excitement (EXC) subscales of the BPRS. This moderate correlation of the EXC subscale was its only correlation, whereas the ANXD scale correlated moderately also with the N scale of the SOPS. The withdrawal/social isolation (WITH) and the hostility/suspiciousness (HOST) scales of the BPRS showed similar, but weaker correlations with the same SOPS scales that correlated with the THOT. Taken together, these data show that in our sample the two instruments behave like if they had a psychotic pole and an affective one. The positive, negative, and disorganised dimensions of the SOPS would constitute along with the thought disorder, isolation-withdrawal and hostility dimensions of the BPRS a psychotic pole, whereas the general dimension of the SOPS (and a part of its negative dimension) and the anxious-depressive and activated/excited dimensions of the BPRS would enter an affective-mood pole (Table IV). It is only the psychotic pole that showed inverse correlations with functioning (Tables V,

VI), whereas the affective pole did not show any correlation with functioning.
The correlations between SOPS and BPRS dimensions were largely expected, as the SOPS explores late prodromal states and is similar qualitatively to the PANSS, another valid psychopathology rating scale. In fact, the focus for rating the degree of risk in the SOPS is on temporal criteria. However, it is noteworthy that the correlations become stronger in the clinical samples with respect to the UHR, whereas the latter had a worse recent shrinking of functioning with respect to the clinical sample. This might imply that screened people with a first psychotic presentation had less deterioration in functioning and a better prognosis than people with UHR, who might represent a special group to follow and treat appropriately, due to a longer kindling of their psychotic outbreak while subclinical.

Limitations

The cross-sectional nature of our study (follow-up data are not currently available), site heterogeneity and the small yield of at-risk mental state individuals are the major limitations of our study. However, the fact that it included all consecutive referrals to any psychiatric service for any reason, increases the generalisability of the obtained results. Another point is the use of the SIPS/SOPS in a clinical population. The SIPS has been designed to assess prodromal populations only, so it might appear as awkward that we used it in cases with FEP, established schizophrenia, and other mental disorders. However, the study design provided for baseline assessment of people seeking for their first time psychological/psychiatric help, so we did not know from the beginning what their condition would be.

Conclusions

The Italian version of the SIPS/SOPS behaves like the original version in assessing at-risk mental states in a population of psychological help-seekers at their first contact with psychiatric services. Longitudinal studies are needed to assess transition to psychosis and the predictive value of the SIPS/SOPS in an Italian population. People at risk score differently than those not at risk for psychosis on both scales; hence, they may represent a psychopathologically distinct population with a high functional impairment.

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