

# Dimensional psychopathology of schizophrenia: SVARAD dimensional profiles in an acute inpatient sample

## *Psicopatologia dimensionale della schizofrenia: profili dimensionali SVARAD in un campione di pazienti acuti ricoverati*

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**SUMMARY. Objective.** This study aimed at describing the dimensional profile of schizophrenia in an acute inpatient sample, and at exploring the different components of psychopathological suffering within this single diagnostic category according to a dimensional perspective. **Methods.** The sample consisted of 81 schizophrenic patients consecutively admitted to a psychiatric inpatient care unit. Each patient was administered the rapid dimensional assessment scale SVARAD (acronym for the Italian name “Scala per la VALutazione RAPida Dimensionale”) and the Global Assessment of Functioning scale. Dimensional profiles were obtained from mean scores on each SVARAD item. Analysis of variance was used to test for differences between groups in mean SVARAD item scores. **Results.** The findings indicated that age, sex, psychosocial functioning, involuntary nature of the admission, and predominance of positive or disorganisation symptomatology are associated with differences in the mean dimensional profile. Also, sizable subgroups of patients with clinically significant levels of psychopathological dimensions (e.g., Sadness/Demoralisation, Anger/Aggressiveness, Impulsivity) that have limited overlap with the traditionally acknowledged domains of positive symptoms, negative symptoms, and disorganisation, were identified. No differences in any psychopathological dimension were found between the classical schizophrenia subtypes. **Conclusions.** The dimensional assessment with SVARAD helps appreciate the singularity of each patient within the same diagnostic category. The study suggests that recognising different dimensional profiles with the SVARAD may allow more personalised choices of treatment.

**KEY WORDS:** schizophrenia, SVARAD, Global Assessment of Functioning scale.

**RIASSUNTO. Obiettivi.** Lo studio ha inteso valutare le potenzialità descrittive dell’approccio psicopatologico dimensionale utilizzando lo strumento Scala di VALutazione RAPida Dimensionale (SVARAD) in una popolazione di pazienti acuti ospedalizzati con diagnosi di schizofrenia. **Metodi.** Il campione è costituito da 81 pazienti con diagnosi di schizofrenia ricoverati presso un reparto per acuti. Ogni paziente è stato valutato tramite la SVARAD e la Scala di Valutazione Globale del Funzionamento. I profili dimensionali sono stati ricavati dai punteggi medi dei singoli item della SVARAD. L’analisi della varianza è stata utilizzata per confrontare le medie dei punteggi SVARAD di vari gruppi di pazienti. **Risultati.** Sono state osservate differenze significative nei profili dimensionali medi a seconda dell’età, del sesso, del funzionamento psicosociale, della natura obbligatoria o volontaria del ricovero, e della predominanza dei sintomi positivi o di disorganizzazione. Inoltre, sono stati identificati sottogruppi numericamente consistenti di pazienti caratterizzati da livelli clinicamente rilevanti di dimensioni psicopatologiche (Tristezza/Demoralizzazione, Rabbia/Aggressività, Impulsività) che hanno una sovrapposizione limitata con le tradizionali dimensioni psicopatologiche della schizofrenia (sintomi positivi e negativi, disorganizzazione). I classici sottotipi della schizofrenia non sono risultati differire su alcuna dimensione psicopatologica della SVARAD. **Conclusioni.** La diagnosi dimensionale effettuata attraverso l’utilizzo della SVARAD rappresenta un valido ausilio nel trattamento mirato dei pazienti con diagnosi di schizofrenia, aiutando il riconoscimento della singolarità di ciascun caso anche se appartenente alla stessa categoria diagnostica.

**PAROLE CHIAVE:** schizofrenia, SVARAD, Scala di Valutazione Globale del Funzionamento.

## INTRODUCTION

Schizophrenia is one of the most complex and disabling psychiatric disorders. Its complexity derives in part from its heterogeneous, multifactorial aetiology, but also from its intrinsic heterogeneity, which is so high that patients with the

same categorical diagnosis may have very different symptom profiles. For this reason, already from the first descriptions by Bleuler, a classification into subtypes was proposed<sup>1</sup>. In subsequent decades, other authors suggested other criteria for classification, which gave value to different aspects and psychopathological phenomena<sup>2-5</sup>. First the ICD-9<sup>6</sup>, and then

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the DSM-III<sup>7</sup>, DSM-IV<sup>8</sup>, and ICD-10<sup>9</sup> have reached a partial agreement on diagnostic criteria to meet clinical and research demands. These criteria have been widely adopted, despite numerous controversies and proposals for revisions<sup>10-14</sup>. As a matter of fact, from both a nosographic and an aetiological perspective, this disorder still eludes clear definitions. The literature review by the DSM-5 Psychosis Workgroup has led to the proposal to rename the diagnostic group as “schizophrenia spectrum and other psychotic disorders”, to make modest changes in the diagnostic criteria, and to eliminate the classical subtypes due their poor reliability, low stability over time, and insignificant prognostic value<sup>15,16</sup>. In the context of these controversies, a dimensional approach to psychopathology and diagnosis may give a valuable contribution. Such an approach was already mentioned in the DSM-IV and DSM-5, though its adoption was delayed due to supposed difficulties with using it in routine clinical practice and relative scarcity of research data.

In the 90s, our group has developed a dimensional approach based on a limited number of symptom clusters, or “psychopathological dimensions”. In this context, a psychopathological dimension is defined as “an alteration of psychic function phenomenologically expressed by a cluster of symptoms or signs that are indicative of and specific to the altered function”<sup>17</sup>. According to this approach, every patient can be characterised based on the relative weight played by each psychopathological dimension, independently of his or her categorical diagnosis. This dimensional approach was operationalised into an observer-rated instrument for the rapid assessment of psychopathological dimensions. This instrument, that was named SVARAD (acronym for the Italian name “Scala per la VALutazione RAPida Dimensionale”), was specifically designed to be used even in busy clinical settings where only a limited amount of time can be devoted to standardised assessment or research<sup>18</sup>.

A strong point of dimensional diagnosis is that it allows for a good psychopathological description of non-specific clinical pictures that in most instances are classified as “not otherwise specified” disorders under the categorical diagnostic systems. Also, this approach helps address the problem of comorbidity and may allow the clinician to make more personalised choices about both pharmacological and psychosocial treatment. Dimensional diagnosis has also some limitations, as it does not provide mental health professionals with an easily shared language, and is difficult to use in epidemiological research and for legal and bureaucratic purposes.

As far as schizophrenia is concerned, factor analytic studies have reported many different symptom structures, depending on sample characteristics and the specific assessment instrument being used<sup>19</sup>. Partly due to the clinical heterogeneity of the disorder itself<sup>20</sup>, there is still no firm agreement about the symptom structure of schizophrenia. The first dimensional models included positive symptoms, negative symptoms<sup>21,22</sup>, and disorganisation<sup>23</sup>. In subsequent years, more complex multidimensional solutions have been proposed to describe the varied expression of schizophrenic symptomatology<sup>24</sup>. In the large majority of studies, the detection of different psychopathological dimensions within the diagnostic entity of schizophrenia was based on the use of sophisticated assessment instruments that require substantial time to be completed and are difficult or impossible to use in high-intensity clinical settings, such as emergency depart-

ments, psychiatric inpatient care units, and high-volume outpatient clinics. The literature lacks studies based on assessment instruments, such as the SVARAD, that are suitable for such settings and allow for a dimensional assessment. This study was carried out on a consecutive sample of inpatients diagnosed with schizophrenia who were administered the SVARAD within a short time from admission. The study aimed at (a) gathering data on the usefulness and feasibility of the SVARAD in a busy clinical setting with patients affected by a severe psychiatric disorder; (b) describing the mean dimensional profile of schizophrenia; (c) exploring the different components of psychopathological suffering within this single diagnostic category according to a dimensional perspective; (d) providing preliminary findings about the usefulness of recognising different dimensional profiles with the SVARAD as a way to allow more personalised choices of treatment. We hypothesised that this dimensional approach would allow for a more subtle description of each patient and more individualised treatment planning.

## METHODS

### Setting and participants

The study was carried out at the psychiatric inpatient care unit of the Department of Neurology and Psychiatry, Sapienza University of Rome, Italy. We included all adult patients who were admitted to the inpatient unit between January 2011 and June 2014, received a diagnosis of schizophrenia according to DSM-IV criteria, were free from major medical illness, and could be assessed within 48 hours of admission. The latter criterion led to the exclusion of 5 patients with severe psychomotor agitation, aggressiveness, or behavioural dyscontrol that required prolonged sedation. A total of 81 patients were included in the study. Their demographic characteristics are detailed in Table 1. Twenty of them (25%) were compulsorily admitted. Most patients (n=76) received an atypical antipsychotic, alone (n=48) or in combination with a conventional antipsychotic (n=28), whereas 5 patients received only a conventional antipsychotic. The average daily dose of antipsychotic medication in terms of chlorpromazine equivalents based on published standards<sup>25</sup> was 687±430 mg/day. Most patients (n=67) received a benzodiazepine, and about half of them (n=49) were also treated with an anticonvulsant mood stabilizer, in most cases (n=42) valproate.

### Procedure

All psychiatric diagnoses were made according to DSM-IV criteria by senior psychiatrists with over 10 years of clinical experience. The standardised assessment was performed by psychiatry residents under close supervision by senior psychiatrists within 48 hours of admission. All patients were rated on the Global Assessment of Functioning (GAF) scale according to the DSM-IV<sup>8</sup> and were administered the SVARAD, which is an observer-rated scale that has been developed in our department and is specifically aimed at the rapid assessment of the main psychopathological dimensions<sup>18</sup>. The validation study provided evidence of inter-rater reliability, content validity, and criterion validity for the SVARAD<sup>26</sup>. In our department, this assessment instrument has been used in both clinical practice and research<sup>27-30</sup> for almost two decades, and all staff members are experienced in its use. The

SVARAD consists of 10 items, each scored on a 5-point scale, ranging from 0 (“not present”) to 4 (“extremely severe”). For each item, a detailed description of the dimension being rated is included, along with defined anchor points for severity. It comprises the following items: (1) Apprehension/Fear: state of anxiety and worry, sense of constriction, perception of imminent threat, feelings of worry, fear, and anguish; (2) Sadness/Demoralisation: distrust in oneself and one’s own abilities, decreased creativity and energy, pessimism, decreased interests and pleasure; (3) Anger/Aggressiveness: feelings of irritation, resentment, and anger, display of irritability, litigiousness, and hostility, verbal or physical violence; (4) Obsessiveness: doubtfulness, rigidity, meticulousness, and perfectionism; repetitive behaviours aimed at preventing, checking, and controlling; presence of obsessions and/or compulsions; (5) Apathy: indifference, detachment, affective flattening and blunting, decreased planning and initiative; (6) Impulsivity: tendency to suddenly act in ways that are improper or potentially harmful to oneself or others, without adequate reflection on the causes or the consequences of one’s own actions; (7) Reality Distortion: difficulty distinguishing between reality and fantasy, tendency to attribute unusual and unshared meanings to events or experiences, presence of delusions or hallucinations; (8) Thought Disorganisation: disruption of connection between ideas and of principles governing the organisation of thought, which thereby becomes altered in its logical organisation and impaired in its communicative functions; (9) Somatic Preoccupation/Somatisation: preoccupation with one’s own body, physical symptoms with no organic basis, excessive concern about one’s own health, exaggerated and unjustified fear of being ill; (10) Activation: increased motor activity, racing thoughts, disinhibition, feelings of excessive energy and self-confidence, euphoria, or irritability.

### Statistical analysis

All statistical analyses were performed using SPSS Statistics for Mac, version 20 (IBM Corp., Armonk, NY, USA). All statistical tests were two-tailed, with alpha set at 0.05. First, patient characteristics were summarized using appropriate descriptive statistics. Then, analysis of variance (ANOVA) was used to test for differences between groups in continuous variables. When more than two groups were compared, Tukey’s post-hoc test for pairwise comparisons was performed in the event of a significant omnibus ANOVA test.

## RESULTS

The socio-demographic and clinical characteristics of the sample (n=81) are reported in Table 1. The “dimensional profile” (i.e., the profile of mean SVARAD scores) of the sample is illustrated in Figure 1. The dimensions showing the highest peaks were Reality Distortion (mean score  $2.90 \pm 1.12$ ), Thought Disorganisation (mean score  $1.93 \pm 1.32$ ), Apprehension/Fear (mean score  $1.93 \pm 1.28$ ), and Apathy (mean score  $1.83 \pm 1.25$ ). The analysis of frequencies revealed that there were subgroups of patients with substantial levels (scores of 2 or above) of Sadness/Demoralisation (n=22, 27%), Anger/Aggressiveness (n=26, 32%), and Impulsivity (n=29, 36%). It also showed that the relatively high mean Apathy scores were due to the presence of a subgroup with mild or no Apathy (n=32, 40%) and of another subgroup (n=49, 60%) with scores of 2 or above (Figure 2).

Table 1. Sociodemographic and clinical characteristics of patients (n=81).

|                                          |             |
|------------------------------------------|-------------|
| Age in years, mean (SD)                  | 42.8 (11.3) |
| Sex, n (%)                               |             |
| Male                                     | 53 (65.4)   |
| Female                                   | 28 (34.6)   |
| Education level, n (%)                   |             |
| Primary school                           | 9 (11.1)    |
| Middle school                            | 31 (38.3)   |
| Secondary school                         | 22 (27.2)   |
| University                               | 8 (9.9)     |
| Missing information                      | 11 (13.5)   |
| Occupation, n (%)                        |             |
| Student                                  | 1 (1.2)     |
| Full-time work                           | 4 (4.9)     |
| Part-time work                           | 4 (4.9)     |
| Unemployed                               | 52 (64.1)   |
| Invalid                                  | 2 (2.5)     |
| Retired                                  | 6 (7.4)     |
| Missing information                      | 12 (14.8)   |
| Marital status, n (%)                    |             |
| Single                                   | 57 (70.3)   |
| Married/cohabitant                       | 6 (7.4)     |
| Separated/divorced                       | 5 (6.2)     |
| Widowed                                  | 3 (3.7)     |
| Missing information                      | 10 (12.3)   |
| Housing, n (%)                           |             |
| Homeless                                 | 4 (4.9)     |
| Alone                                    | 14 (17.3)   |
| Family of origin                         | 28 (34.6)   |
| Family of creation                       | 8 (9.9)     |
| Psychiatric community                    | 2 (2.4)     |
| Non-psychiatric community                | 2 (2.4)     |
| Nursing home/foster home                 | 3 (3.7)     |
| Other                                    | 3 (3.7)     |
| Missing information                      | 18 (20.9)   |
| Civil ability, n (%)                     |             |
| Capable                                  | 49 (60.5)   |
| Incapable (with public guardian/trustee) | 9 (11.1)    |
| Missing information                      | 23 (28.4)   |

(Segue)

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(Segue) Table 1.

| Clinical subtype, n (%)                                        |           |
|----------------------------------------------------------------|-----------|
| Disorganised                                                   | 6 (7.4)   |
| Paranoid                                                       | 36 (44.4) |
| Residual                                                       | 26 (32.1) |
| Unspecified                                                    | 13 (16.0) |
| Type of admission to psychiatric ward, n (%)                   |           |
| Voluntary                                                      | 60 (74.1) |
| Involuntary                                                    | 20 (24.7) |
| Missing information                                            | 1 (1.2)   |
| GAF score at admission, mean (SD)                              |           |
| GAF= Global Assessment of Functioning; SD= standard deviation. |           |

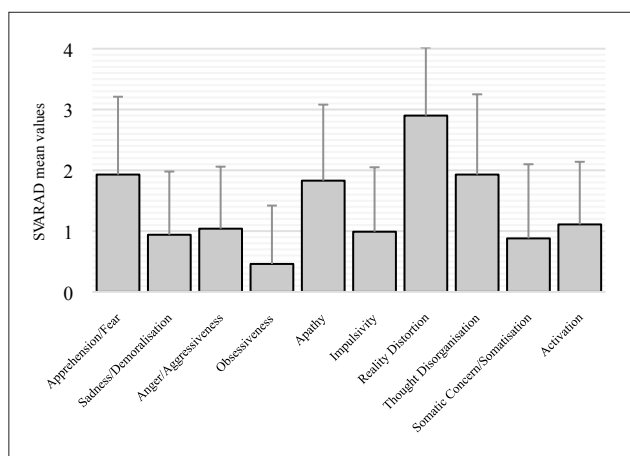


Figure 1. SVARAD profile of inpatients with schizophrenia: mean scores and standard deviations (n=81).

There were no significant differences in the dimensional profile by age, except for Somatic Preoccupation/Somatisation, which was higher among younger (age <40 years) as compared with older (age ≥40 years) patients (mean score  $1.28 \pm 1.32$  vs  $0.61 \pm 1.07$ ,  $p=0.02$ ) (Figure 3). Sex-related differences were found for Reality Distortion, with women showing significantly higher mean scores than men ( $3.38 \pm 0.73$  vs  $2.64 \pm 1.21$ ,  $p<0.01$ ), and, at statistical trend level, for Anger/Aggressiveness, with women again showing significantly higher mean scores than men ( $1.32 \pm 1.09$  vs  $0.89 \pm 0.95$ ,  $p=0.07$ ) (Figure 4). Compulsorily admitted patients showed higher mean scores on Thought Disorganisation as compared with voluntarily admitted patients ( $2.50 \pm 1.10$  vs  $1.73 \pm 1.35$ ,  $p=0.03$ ) (Figure 5). Patients with severe impairment in psychosocial functioning, as indicated by a GAF score ≤30, displayed significantly higher scores on Reality Distortion ( $3.22 \pm 0.96$  vs  $2.24 \pm 1.20$ ,  $p<0.001$ ) and Thought Disorganisation ( $2.20 \pm 1.31$  vs  $1.40 \pm 1.19$ ,  $p=0.01$ ) as compared with patients with a GAF score >30 (Figure 6).

The patients with severe positive symptoms (n=58) as indicated by severe (score 3) to extreme (score 4) levels of Reality Distortion displayed significantly higher levels of Thought Disorganisation ( $2.19 \pm 1.27$  vs  $1.26 \pm 1.21$ ,  $p<0.01$ ) and Activation ( $1.33 \pm 1.06$  vs  $0.57 \pm 0.72$ ,  $p<0.01$ ) as compared with the patients with no or mild to moderate positive symptoms (n=23) as indicated by scores on Reality Distortion ranging from 0 to 2. The patients with severe disorganisation (n=33) as indicated by severe (score 3) to extreme (score 4) levels of Thought Disorganisation showed significantly higher levels of Impulsivity ( $1.27 \pm 1.12$  vs  $0.79 \pm 0.98$ ,  $p<0.05$ ), Reality Distortion ( $3.39 \pm 0.78$  vs  $2.56 \pm 1.20$ ,  $p<0.01$ ), and Activation ( $1.55 \pm 0.97$  vs  $0.81 \pm 0.98$ ,  $p<0.01$ ) as compared with the patients with no or mild to moderate disorganisation (n=48) as indicated by scores on Thought Disorganisation ranging from 0 to 2. No significant differences in any SVARAD dimension except Apathy were observed between patients with severe negative symptoms (n=27) as indicated by severe (score 3) to extreme (score 4) levels of Apathy and patients with no or mild to moderate negative symptoms (n=54) as indicated by a score on Apathy ranging from 0 to 2.

Finally, no significant differences in psychopathological dimensions were observed between the classical schizophrenia subtypes, with only a statistical tendency towards higher levels of Reality Distortion among patients classified into the paranoid subtype.

## DISCUSSION

This study aimed at describing the “dimensional profile” of a sample of inpatients diagnosed with schizophrenia, and at exploring the different components of psychopathological suffering within this diagnostic category according to a dimensional perspective. The findings indicated that age, sex, psychosocial functioning, involuntary nature of the admission, and predominance of positive or disorganisation symptomatology are associated with differences in the mean dimensional profile. They also suggested that within this single diagnostic category there are patient subgroups characterised by substantial levels of psychopathological dimensions (e.g., Sadness/Demoralisation, Anger/Aggressiveness, Impulsivity) that have limited overlap with the traditionally acknowledged domains of positive symptoms, negative symptoms, and disorganisation.

Younger patients (age <40 years) displayed lower levels of Somatic Preoccupation/Somatisation as compared with older patients. A previous study that examined the prevalence and correlates of medically unexplained somatic symptoms in patients with schizophrenia did not find an association between somatisation and age<sup>31</sup>. However, our finding is intriguing in the light of the fact that Somatization Disorder usually appears in young adulthood<sup>32</sup> and that there seems to be an age-related decline in prevalence rates of somatoform disorders in the general population, as they range from 11% to 21% in younger, 10% to 20% in the middle-aged, and 1.5% to 13% in the older age groups<sup>33</sup>. Possibly, younger patients, independent of categorical diagnosis, are more susceptible to somatisation phenomena.

In our sample, women showed higher scores on Reality Distortion and a statistical tendency towards higher scores on Anger/Aggressiveness as compared with men, which sug-

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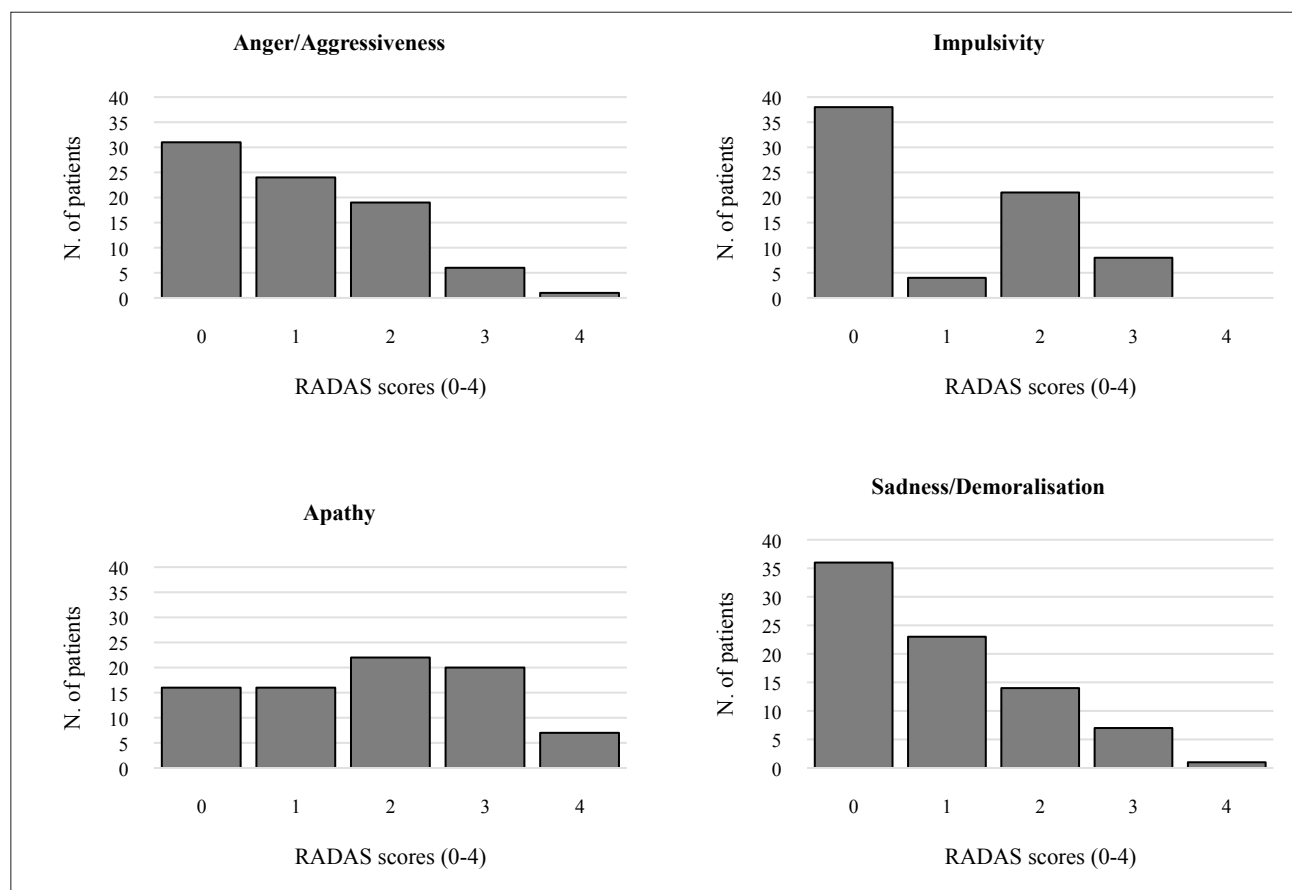


Figure 2. Number of patients scoring 0-4 on the SVARAD Anger/Aggressiveness, Impulsivity, Apathy, and Sadness/Demoralisation dimensions.

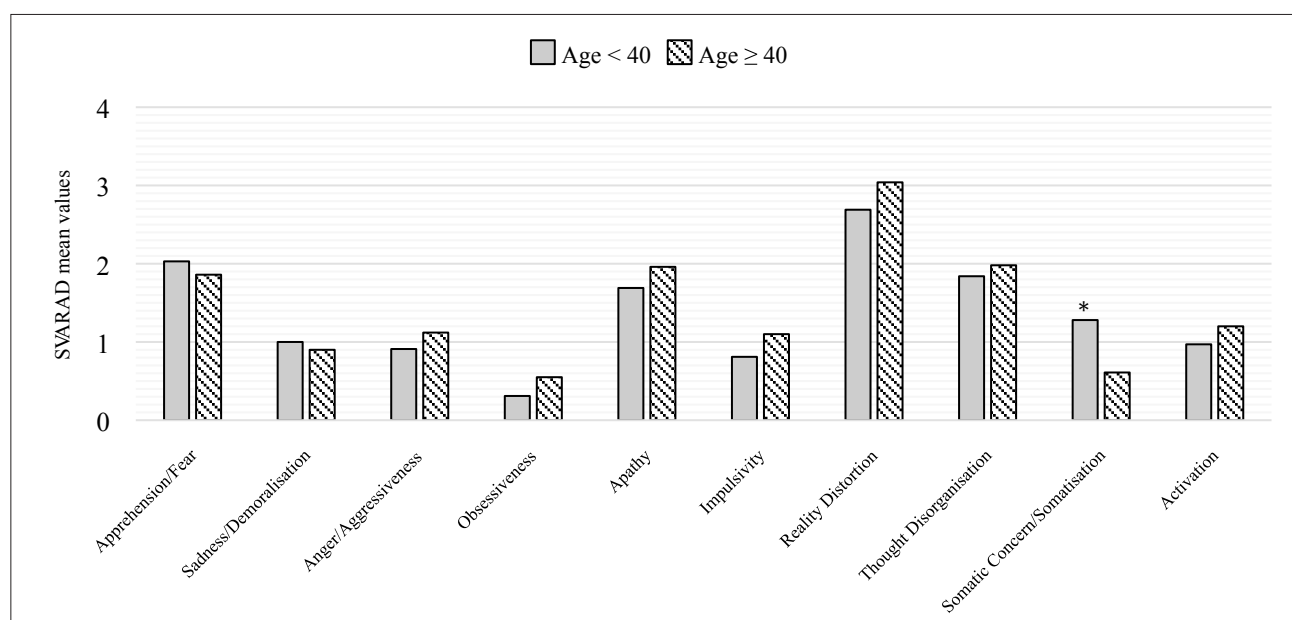


Figure 3. SVARAD profile by age (<40 years, n=32; ≥40 years, n=49).

\*p<0.05.

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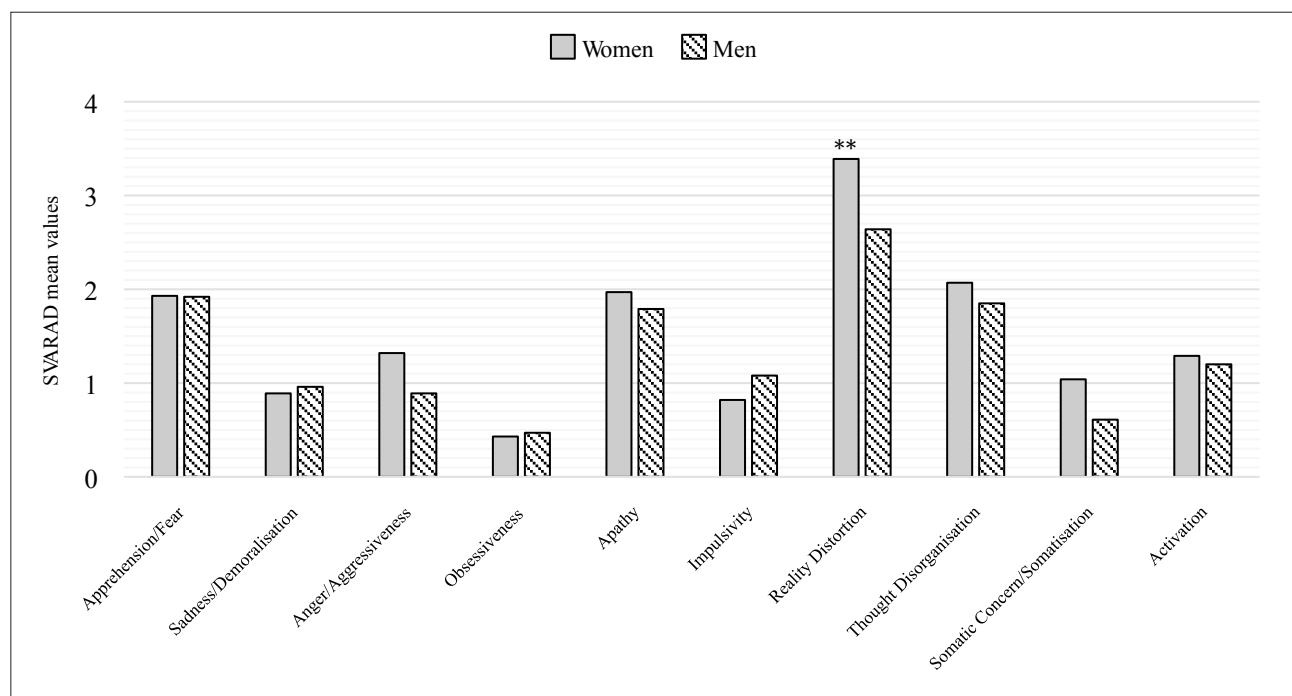


Figure 4. SVARAD profile by sex (53 men, 28 women).

\*\*p<0.01.

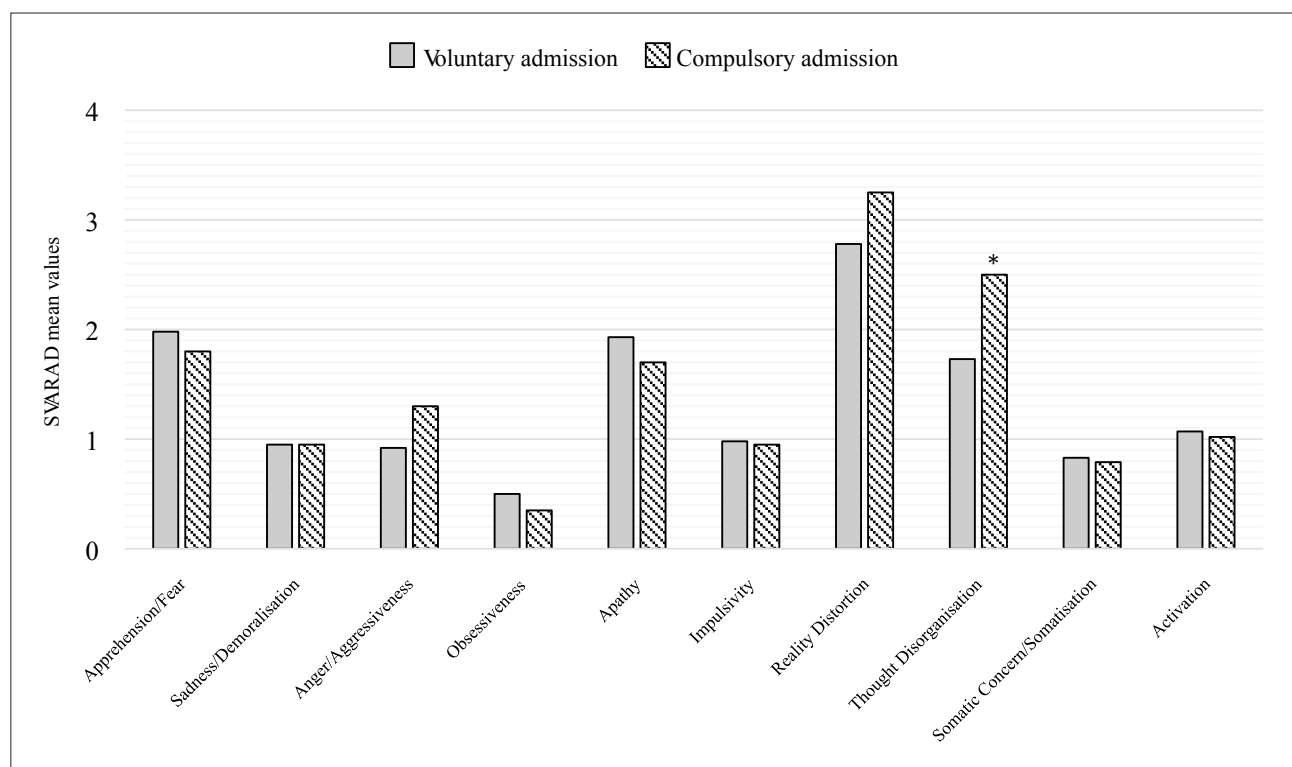


Figure 5. SVARAD profile by type of admission (compulsory, n=20; voluntary, n=49).

\*p<0.05.

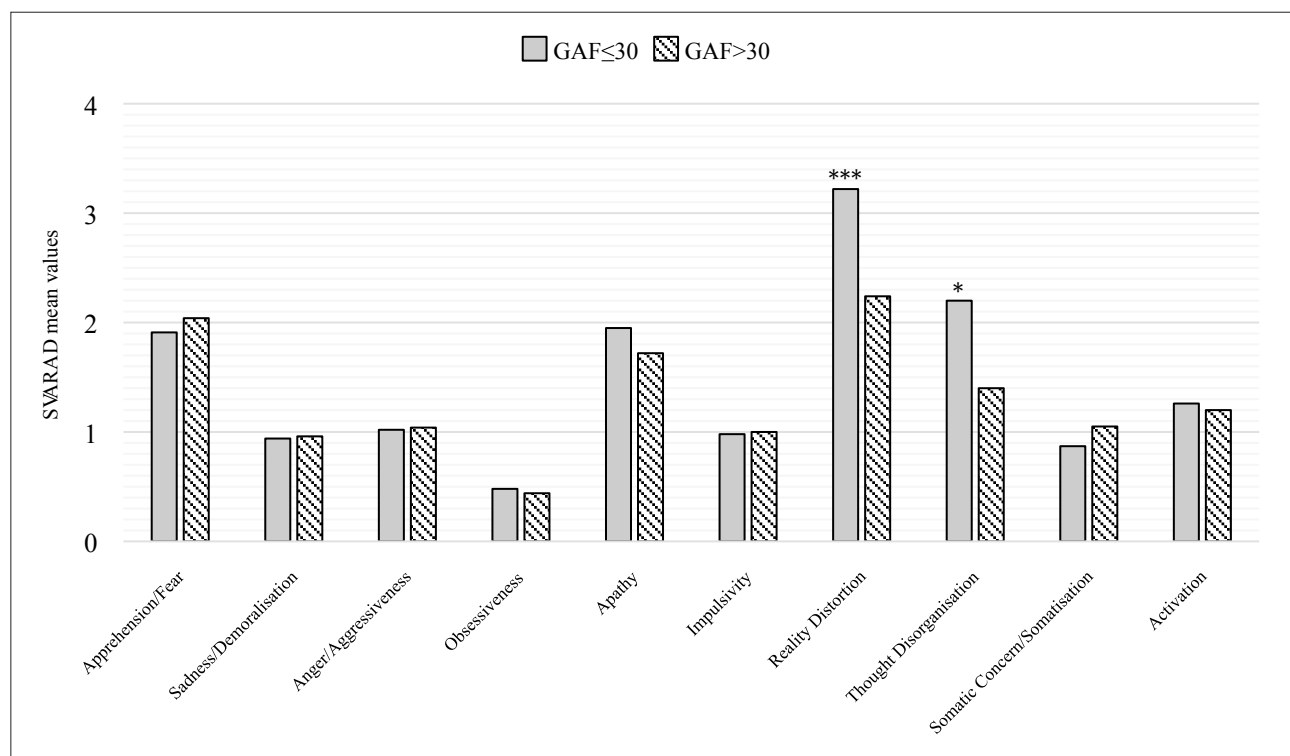


Figure 6. SVARAD profile by Global Assessment of Functioning (GAF) score ( $\leq 30$ ,  $n=54$ ;  $>30$ ,  $n=25$ ).  
\* $p<0.05$ . \*\*\* $p<0.001$ .

gests greater levels of positive symptoms among female patients. This finding is not consistent with previous studies<sup>34,35</sup> and may reflect different treatment choices for male and female patients, with the former receiving higher doses of antipsychotic medication. Indeed, the mean daily dose of antipsychotics, expressed as chlorpromazine equivalents, was higher in men ( $709 \pm 487$  mg/day) than in women ( $644 \pm 298$  mg/day), although the difference did not reach statistical significance.

The findings concerning compulsorily admitted patients are of particular interest, as patients with schizophrenia and other psychotic disorders are those who most frequently undergo compulsory admission to a psychiatric inpatient ward<sup>36</sup>. Nevertheless, relatively scarce information is available about sociodemographic, and especially psychopathological, characteristics of patients diagnosed with schizophrenia who are involuntarily admitted to psychiatric inpatient units<sup>37</sup>.

While one would expect higher levels of Anger/Aggressiveness, Impulsivity, and Activation to be associated with involuntary admission, the only significant difference that we found between compulsorily admitted patients and voluntarily admitted patients was a higher level of Thought Disorganisation in the former. This finding is interesting, and it suggests that for patients with schizophrenia severe psychotic symptoms play the most important role in the process leading to compulsory admission. A previous Irish study did not report a difference in the mean score on the PANSS

Conceptual Disorganisation item between compulsorily and voluntarily admitted patients<sup>38</sup>. Rather, in previous studies on patients with schizophrenia<sup>38</sup> or schizophrenia spectrum disorders<sup>39</sup> the patients undergoing compulsory admission displayed higher levels of positive symptoms<sup>36,38,39</sup> and excitement<sup>39</sup>. Differences in the patient populations and in the legal definition of compulsory admission across different countries may account for the discrepancies in findings between our study and the previous literature.

Severe psychotic symptoms also characterised the patients with more profound impairment in psychosocial functioning. In fact, the patients with a GAF score  $\leq 30$  showed significantly higher levels of Reality Distortion and Thought Disorganisation than patients with better GAF scores. This finding is consistent with previous studies on patients with schizophrenia<sup>40,41</sup> and with the notion that GAF scores for patients with psychosis tend to reflect symptom severity rather than functional impairment<sup>42</sup>.

In agreement with a previous study of ours<sup>20</sup>, psychopathological dimensions, rather than the classical schizophrenia subtypes, discriminated between patients with different symptom profiles. In fact, the patients with severe positive symptoms showed significantly higher levels of Thought Disorganisation and Activation as compared with the patients in whom these symptoms were not prominent. Also, the patients with severe disorganisation displayed significantly higher levels of Impulsivity, Reality Distortion, and Activation than the patients with no or milder disorganisa-

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tion. On the contrary, the classical schizophrenia subtypes did not significantly differ in any psychopathological dimension.

Summarising, the SVARAD assessment highlighted how variable and multifaceted are the psychopathological components within the single diagnostic DSM-IV category of schizophrenia, which is indeed recognised as highly heterogeneous<sup>43</sup>, to such an extent that this diagnosis may identify individuals who share few or no symptoms in common<sup>44</sup>. The SVARAD provided a concise and clear description of how a substantial proportion of patients suffered from symptoms that are not formally included in the DSM or ICD criteria for the diagnosis of schizophrenia, such as Sadness/Demoralisation and Anger/Aggressiveness. Also, significant associations were found between a number of dimensions and sociodemographic variables, psychosocial functioning, and type of admission. Most importantly, the analysis suggested the presence of clinically important patient subgroups, characterised either by severe Reality Distortion, Thought Disorganization, Impulsivity, and Activation, or by milder positive and disorganisation symptoms and prominent Apathy and Sadness/Demoralisation, or by high levels of Anger/Aggressiveness.

The identification and description of these subgroups represents an important contribution of dimensional analysis in enhancing the categorical approach to mental disorders. While the diagnostic categories respond to a standard criteria set, they also differ on some psychopathological dimensions that may even not be represented in the criteria set. The addition of the dimensional approach may allow to better capture the complexity underlying diagnostic categories and thereby may help optimise treatment choices by tailoring drug treatments to specific psychopathological components within a single category<sup>45</sup>. As far as schizophrenia is concerned, the typical or atypical D2 blockers are the first-line drugs for the patient subgroup with severe Reality Distortion, but antiepileptic medication could be added for targeting Anger/Aggressiveness and Impulsivity in selected cases. On the other hand, D2 blockers, even the atypical ones, have limited indication for patients low in Reality Distortion and with prominent Apathy and Sadness/Demoralisation, who may rather benefit from low-dose antidepressants.

The present study has some limitations. First, the diagnosis of schizophrenia was not established with a standardised diagnostic interview. However, all diagnoses were made after a professional psychiatric examination, and were confirmed by an experienced faculty psychiatrist who carefully reviewed all clinical records. Second, the patients began to receive psychotropic medication immediately after admission, which may have affected the psychopathological assessment and the resulting dimensional profile. This limitation is inescapable due to the nature of the disorder and the study design. However, it should not have substantially influenced the results, as only a short time period elapsed between admission and the administration of the SVARAD. Third, our study relied on a single, cross-sectional dimensional assessment; longitudinal data may allow a broader perspective on the dimensional psychopathology of schizophrenia and on the effects of different treatments on the various psychopathological dimensions.

In conclusion, the SVARAD allowed a rich description of the psychopathological variability within the single diagnostic DSM-IV category of schizophrenia in a relatively large

sample of patients. The limitations of this study do not detract from the fact that a dimensional perspective permits to investigate the true diversity of cases satisfying the criteria for a single diagnostic category. Though preliminary, our findings suggest that recognising different dimensional profiles with the SVARAD may allow personalised choices of treatment. Future studies should examine if, and to what extent, the addition of a dimensional perspective to the standard categorical approach may improve treatment effectiveness. This is indeed an interesting new avenue for research. Undoubtedly, the categorical approach to psychiatric diagnosis continues to be quite useful, as it provides mental health professionals with a shared language, and researchers with reliable diagnostic standards that allow formulating testable hypotheses about each syndromal entity<sup>46</sup>. However, in clinical practice the use of rigid diagnostic criteria poses some problems, as it may lessen the importance of clinical judgment and risks reducing the complex concept of mental health to a mere healthy/ill dichotomy. Furthermore, the categorical approach has difficulties in addressing the porosity of diagnostic boundaries between several syndromal entities. Drawing boundaries between psychiatric diagnostic entities has so far proved to be a daunting task that defeated all attempts at finding an optimal solution<sup>46</sup>. It has been stated that we seem to be drawing lines in the fog, rather than “carving nature at its joints”<sup>47</sup>. The limitations of the categorical approach can be reduced by integrating the two approaches. The categorical approach might well be integrated with the dimensional perspective, in order to reach a better representation of the distinct components of suffering in each diagnostic category. In the future, there is a need for further, carefully designed studies to further the development of enhanced methods for personalised diagnosis and treatment of mental disorders.

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