

Positive and negative symptoms in schizophrenia and their relation to depression, anxiety, hope, self-stigma and personality traits – a cross-sectional study

Kristyna VRBOVA¹, Jan PRASKO¹, Michaela HOLUBOVA^{1,2},
Milos SLEPECKY³, Marie OCISKOVA¹

¹ Department of Psychiatry, Faculty of Medicine and Dentistry, University Palacky Olomouc, University Hospital Olomouc, the Czech Republic

² Department of Psychiatry, Hospital Liberec, the Czech Republic

³ Department of Psychology Sciences, Faculty of Social Science and Health Care, Constantine the Philosopher University in Nitra, the Slovak Republic

Correspondence to: Prof. Dr. Jan Prasko, PhD.
Department of Psychiatry
University Hospital Olomouc and Faculty of Medicine and Dentistry
Palacky University Olomouc
I. P. Pavlova 6, 77520 Olomouc, the Czech Republic.
TEL: +420 603 414 930; E-MAIL: prasko.jan@seznam.cz

Submitted: 2017-08-29 *Accepted:* 2017-10-10 *Published online:* 2018-03-28

Key words: **schizophrenia; positive and negative symptoms; traumatic symptoms; social anxiety; hope; self-stigma; depression; anxiety**

Neuroendocrinol Lett 2018;39(1):9–18 PMID: 29604619 NEL390118A03 ©2018 Neuroendocrinology Letters • www.nel.edu

Abstract

OBJECTIVE: The purpose of the investigation was to explore the relationship between positive or negative symptoms, social anxiety, hope, personality, and self-stigma in patients with schizophrenia spectrum disorders.

METHOD: 57 outpatients took part in this cross-sectional study. The structured interview M.I.N.I. International Neuropsychiatric Interview was used to confirm the diagnosis. All patients completed the Liebowitz Social Anxiety Scale, Internalized Stigma of Mental Illness Scale, Beck Depression Inventory-II, Beck Anxiety Inventory, Adult Dispositional Hope Scale, and Temperament and Character Inventory – Revised. The disorder severity was evaluated by Clinical Global Impression – Severity scale, and Positive and Negative Syndrome Scale. The patients were in a stabilized state that did not require hospitalization or modifications in the treatment.

RESULTS: Both positive and negative symptoms of schizophrenia positively correlated with the length of the disorder, global severity of the disorder, the severity of the general and social anxiety symptoms, the severity of self-stigma, and negatively with personality traits Self-directedness and Cooperativeness. Only negative symptoms significantly positively correlated with the severity of depressive symptoms and personality trait Harm-avoidance and negatively with the hope and personality trait Persistence. Comorbidity with social phobia is associated with statistically significantly higher mean scores on the total score of schizophrenic symptomatology, negative subscale average rating, and general psychopathological items measured by PANSS. Patient with comorbid depression would experience a higher level of negative symptomatology than patients without such comorbidity.

CONCLUSION: The main findings of the present study were two: first, the positive and negative symptoms highly correlated with the severity of anxiety symptoms including social anxiety, self-stigma and negatively with the character traits Self-directedness and Cooperativeness. Secondly, the negative symptoms only correlated negatively with hope, depression, Harm-avoidance, and Persistence.

INTRODUCTION

Negative symptoms are responsible for a significant proportion of the disability linked with schizophrenia. They are more closely related to prognosis than positive symptoms. Negative symptoms tend to be the most persistent (APA 2013). However, their subtle nature kept them unrecognized until the development of specific quantifying measures. Over the preceding three decades, there has been a tremendous urge in research on their types, measurements, status and their implications in the present classificatory system (Mitra *et al.* 2016). Interest in negative symptoms of patients with schizophrenia is now greater than before, paralleling an increasing attention to the functional influence of negative symptoms (Remington *et al.* 2016). Many studies with antipsychotics and psychosocial rehabilitation have been done to find the optimal treatment strategies in the patients with severe negative symptoms. However, little is known about the connections between negative symptoms and hope, self-stigma and personality traits of the schizophrenic patients.

Several findings have shown that the self-stigma presents a significant theme among patients with schizophrenia (Livingston & Boyd 2010; Wang *et al.* 2016). Self-stigma is three phases process in which the patient gives himself a socially handicapping label, internalize it, and adopts that others will behave in a negative way to him/her, or despise him/her (Yanos *et al.* 2010; Rüsç *et al.* 2009; Margetić *et al.* 2010). The outcomes of a systematic review of Gerlinger *et al.* (2013) suggest that one-third to one-half of schizophrenia patients feel shame as a consequence of the disorder. Higher rates of the self-stigma are associated with a higher rate of overall psychopathology, depression, anxiety, lower self-esteem, hope, and worse social, occupational and vocational functioning, less cooperation in the treatment, and last but not least the lower quality of life (Wahl 1999; Sirey & Bruce 2001; Watson *et al.* 2007; Gaebel *et al.* 2008; Yanos *et al.* 2008; Yen *et al.* 2009; Yanos *et al.* 2010; Cavelti *et al.* 2011; Hanzawa *et al.* 2012; Kamaradova *et al.* 2016). The more pronounced self-stigma is also connected with higher avoidance and isolation (Schulze & Angermeyer 2003).

Hope is associated with the life goals and anticipation of an optimistic outcome of the own exertion (Snyder 2000; Snyder *et al.* 2002). Snyder concept of hope contains emotion, motivation, behavior, and cognition (Ociskova *et al.* 2016). In schizophrenia patients,

the hope, depression, and self-stigma are interrelated (Schrank *et al.* 2014). There was no information about relationships among hope and positive and negative symptoms of the disorder.

Personality traits can significantly influence the symptoms and the social functioning in schizophrenia (Lysaker *et al.* 1998). Cloninger's psychobiological theory of personality presents a concept that identifies four temperamental and three character traits – Novelty Seeking, Harm Avoidance, Reward Dependence, Persistence, Self-Directedness, Cooperativeness, and Self-Transcendence (Cloninger *et al.* 2009). The four temperament dimensions measures individual differences in basic emotions and drives and are independently inherited and moderately stable throughout life: Harm Avoidance (HA; anxious and pessimistic versus careless and risk-taking, measured tendencies to avoidance, worry, pessimism, shyness, fatigability, vulnerability to emotional instability and vulnerability to self-consciousness.), Novelty Seeking (NS; anger-prone and impulsive versus stoical and rigid), Reward Dependence (RD; warm and sociable versus cold and aloof), and Persistence (PS; ambitious and perfectionistic versus easily discouraged and spoiled). The TCI also measures three dimensions of character, which can be understood as the three branches of person's mental self-government. Self-Directedness (SD; executive functions, such as being purposeful, resourceful, and hopeful) Cooperativeness (CO; legislative functions, such as being helpful, agreeable, and loving), and Self-Transcendence (ST; judicial functions, such as being intuitive, insightful, and faithful). Typical personality characteristics of patients with schizophrenic spectrum disorder include a higher Harm Avoidance (HA) and lower Reward Dependence (RD) (Smith *et al.* 2008; Guillem *et al.* 2002; Kurs *et al.* 2005). Some studies have found a lower level of Novelty Seeking (NS) and Persistence (PS) among the patients (Guillem *et al.* 2002; Smith *et al.* 2008), but most studies have not found statistically significant differences compared to healthy controls (Gonzalez-Torres *et al.* 2009; Kurs *et al.* 2005; Bora & Veznedaroglu 2007; Fresan *et al.* 2015). In character dimensions, lower scores of Cooperativeness (CO), Self-directedness (SD) and higher scores of Self-transcendence (ST) have been found (Hori *et al.* 2008; Guillem *et al.* 2002; Cortés *et al.* 2009). The presence of particular personality traits could be linked to the dominant clinical symptomatology. With positive psychotic symptoms, higher scores of the temperamental dimensions of ST and in some cases NS were more often associated, while SD and CO achieved lower scores compared to healthy controls (Hori *et al.* Guillem *et al.* 2002 Smith *et al.* 2008). In the case of individuals with a negative symptom, higher levels of HA and lower scores of SD and CO have been found (Hori *et al.* 2008; Guillem *et al.* 2002; Smith *et al.* 2008).

Some authors believe that the components of temperament, mainly HA, and are applied primarily during

the beginning of the disorder and in acute stages of illness, while character dimension, especially SD and CO, may have a greater influence on the course and overall prognosis of the disease (Mezzich *et al.* 2010; Guillem *et al.* 2002). Boeker *et al.* (2006) found that the character dimensions of ST and SD were significantly associated with working memory tasks in healthy participants and were significantly related to executive functioning tasks in patients with schizophrenia. SD and PS are also essential portions of Snyder's theory of hope (Ociskova *et al.* 2015).

The temperament trait HA is linked to an amplified liability to rejection and criticism which grades to avoidance of social situation (Cloninger 1986). HA indicates the occurrence of anticipatory anxiety, fear of uncertainty, shyness, and fatigability. It processes the tendency to respond with overall attenuation to aversive stimuli (Cloninger *et al.* 1993). This trait predicts both social isolation and gradually increasing negative feelings in contact with people in patients with the schizophrenia. Despite the fact that Cloninger himself ranks Harm-Avoidance to predominantly inherent temperament personality trait (Cloninger *et al.* 2009) is not yet clear if throughout the psychotic progression this trait could be intensified. SD was placed among character traits which are established during life experiences (Cloninger 1986). Cloninger considers that SD is shifting throughout the life (Cloninger 1994).

The objective of the current study was to examine the relationship between positive and negative schizophrenia symptoms and traumatic symptoms, social anxiety, hope, and self-stigma, in stabilized patients with schizophrenia spectrum disorders.

The hypotheses of the study, derived from the knowledge mentioned above, were:

1. Both severities of positive and negative symptoms of schizophrenia are correlated with (a) length of the disorder; (b) global severity of the disorder; (c) seriousness of the general and social anxiety symptoms; (d) severity of self-stigma, (e) Self-directedness and Cooperation;
2. Only severity of the negative symptoms significantly correlate with (a) severity of depressive symptoms; (b) hope, (c) Harm-avoidance and Persistence;
3. Patients with a comorbid anxiety disorder have higher positive symptomatology than patients without such comorbidity;
4. Patients with comorbid depression have higher negative symptomatology than patients without such comorbidity.

METHOD

Patients

Fifty-seven patients of both genders, attending a psychiatric department for an outpatient management, in stable condition (the patients without need of changes

in medication, hospitalization, or other therapeutic intervention), entered into the study. The structured interview M.I.N.I. (Mini International Neuropsychiatric Interview) was used to confirm the diagnosis (Sheehan *et al.* 1998). Inclusion criteria were:

1. Age 18–65 years.
2. Diagnosis of the schizophrenia spectrum disorders according to ICD-10 and DSM-5 (ICD-10 1996; APA 2013).
3. The severity of the illness was determined thorough interview with the doctor, who evaluated the severity on the objCGI-S scale (Guy 1976).

Exclusion criteria:

1. Presence of a severe physical illness
2. Intellectual disability, or organic mental disorder.

Assessment instruments

All patients completed informed consent, assessment scales, and questionnaires. The methods were assessed in two sessions during two weeks. At the first meeting, there were used instruments M.I.N.I., LSAS, BAI, BDI-II, CGI, and ADHS. Other questionnaires were allocated at the following the session. The reason was the attention disabilities of the patients with schizophrenia. The following assessment tools were used:

- M.I.N.I. (The Mini International Neuropsychiatric Interview) - MINI is a structured interview covering diagnostic criteria for common psychiatric disorders according to the DSM-IV, and ICD-10 (1996). Interrater reliability is 0.75 or higher in all parts of the diagnostic assessment, except the less reliable current manic episode.
- PANSS (Positive and Negative Syndrome Scale, Kay *et al.* 1987) – The scale involves 30 items allocated into three subgroups: 7 positive (“PANSS P”), seven negative (PANSS N) and 16 general psychopathological items. Each item is assessed from 1 (absent) to 7 (extremely present). The total score is the sum of all points, called PANSS Total (PANSS T).
- CGI (Clinical Global Impression) – The global clinical impression is an evaluation of the overall severity of the disorder (Guy 1976). The source of the assessment in objCGI-S is a comprehensive assessment of the patient is by a physician. In its subjective version (subjCGI-S) patient evaluates the overall condition. The range of the scale is from 1 (normal, with no signs of illness) to 7 (extremely severe symptoms of the disease).
- BAI (Beck Anxiety Inventory) – Beck anxiety inventory involves 21 items with a four-point Likert scale for indicating the severity of anxiety symptoms last week (Beck *et al.* 1988). Kamaradova *et al.* 2015) validated BAI in Czech. The scale exhibited excellent internal consistency (Cronbach's alpha = 0.92).
- BDI-II (Beck Depression Inventory-II) – Beck Depression Inventory includes 21 items of which the patient selects one of the four defined opportunities

that best matches how they have felt in the last two weeks (Beck *et al.* 1996). Correlation BDI-II with other standardized scales of depression is around 0.70, internal consistency (Cronbach's alpha) ranges from 0.73 to 0.95 (Domino & Domino 2006). The test was adapted to Czech population (Preiss & Vacir 1999) and standardized by Ociskova *et al.* (2017). The internal consistency of the inventory is excellent (the ordinal alpha coefficient was 0.90 for the patients and 0.93 for the controls).

- LSAS (The Liebowitz Social Anxiety Scale) – The scale consists of 24 items related to different social situations (Liebowitz 1987). The patients are requested to assess the level of anxiety and degree of avoidant behavior for each circumstance. The scale is a frequently used clinician-administered instrument. The present study used its self-report version. Fresco *et al.* (2001) tested the psychometric properties of the LSAS-self-report in contrast to the LSAS-clinician-administered. There was a marginal difference between the two forms of the LSAS. Both versions were internally consistent, and the subscale intercorrelations for the both forms were principally equal. Baker *et al.* (2002) study report on the properties of the LSAS-self-report. The questionnaire exhibited excellent psychometric properties as showed by the outcomes of internal consistency, test-retest reliability, and discriminant and convergent validity. Moreover, the measure was sensitive to treatment change.
- ADHS (Adult Dispositional Hope Scale) – the scale consists of the 12 items – four assesses the capability to set the adaptive pathway to the aim, four focus on effort and four are distractors (Snyder *et al.* 2000). The patient chooses the amount of agreement with the statement on eight point scale. Ocisková *et al.* (2016) standardized the measurement in Czech. The translation displays a good degree of internal consistency – the overall Cronbach's alpha was 0.85.
- ISMI (The Internalized the Stigma of Mental Illness Scale) – The scale contains 29 items with a four-point scale, which evaluates five areas of self-stigma (Ritsher *et al.* 2003). These include feelings of Alienation from the society, the rate of Stereotypes endorsement about persons with psychiatric disorder, Perceived discrimination (how the patient feels the behavior from others to him because of psychiatric diagnosis), Social withdrawal and the degree of Stigma resistance (Ritsher *et al.* 2003; Boyd *et al.* 2014). ISMI was standardized by Ociskova *et al.* (2014) in the Czech Republic with excellent internal consistency (Cronbach's alpha = 0.91).
- TCI-R (Temperament and Character Inventory – Revised) – The revised version of the Inventory of Temperament and Character consists of 240 items (Farmer & Goldberg 2008). The questionnaire evaluates four temperamental and three character personality traits. Features of temperament include

Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD), and Persistence (PS). Characteristic features include Self-directedness (SD), Cooperativeness (CO), and Self-transcendence (ST) (Gillespie *et al.* 2003). Czech percentile standards were created by Preiss & Klose (2001).

- Demographic questionnaire contained the basic information – gender, age, marital status, education, employment, disability, age of the disorder onset, duration of attendance to a psychiatry, the number of hospitalizations, length of last hospitalization, number of visited psychiatrists, medications, data on stopping medication in the past (on the recommendation of a psychiatrist or willingly).

Statistics and ethics

The statistical programs Prism (GraphPad PRISM version 5.0; <http://www.graphpad.com/prism/prism.htm>) and SPSS 24.0 were used for the statistical estimation of the results. Demographic data and the average scores in the distinct questionnaires and scales were evaluated using descriptive statistics (means, medians, standard deviations, and the character of data distribution). Means were compared by using unpaired t-tests. Relations between categories have been calculated using correlation coefficients. Fisher's exact test verified the relationship between alternative variables (gender, marital status, discontinuation of medication). Backward stepwise regression tested the significance of each significant correlation coefficient. The statistical tests were reflected as satisfactory at 5 % level of statistical significance.

The local ethical committee of University Palacky Olomouc, Faculty of Medicine and Dentistry, accepted the study. The research was conducted by the latest version of the Helsinki Declaration, and recommendations for good clinical praxis (EMEA 2002; WMA 2013). Patients signed an informed consent.

Medication management

All patients had prescribed antipsychotics in the range of advised therapeutic doses (mean 5.79 ± 3.96 mg dose of the antipsychotics index; converted to the dosage on the dosage of risperidone). In addition to the antipsychotic medication, 25 patients (43.9%) were also treated with antidepressants, seven patients (12.3%) by benzodiazepine anxiolytics, and seven patients (12.3%) by mood stabilizers. Medications were administered according to the recommended Czech guidelines for the treatment of schizophrenia (Ceskova *et al.* 2014).

RESULTS

Description of the sample

The data were collected in the period from May 2016 to August 2017. 57 patients (81.4 %) completed questionnaires. The demographic, clinical, and psychological data are described in Table 1.

Tab. 1. Sample description: demographic, clinical, and measured data.

CATEGORY	FIGURES OR MEANS
Number of patients	57
Age	35.79±9.94
Sex: men / women	26 / 31
Education: basic / vocational training / secondary / university	9 / 21 / 17 / 10
Occupation: yes / no	30 / 27
Pension: no / full / partial	29 / 18 / 10
Marital status: single / married / divorced / widowed	38 / 11 / 6 / 2
Partner: yes / no	18 / 39
Onset of the disorder	28.47±9.93
Number of hospitalizations	3.19±2.69
Length of the treatment	6.91±8.68
Positive family history: no / yes	31 / 26
PANSS-total	59.49±13.17
PANSS Positive 1-7	11.39±3.20
PANSS Negative 1-7	15.72±4.77
PANSS General 1-16	32.39±7.44
objCGI-S	2.84±0.90
subjCGI-S	2.35±1.47
BDI-II	15.23±10.63
BAI	13.74±11.76
LSAS – Total	89.09±26.27
Fear	43.91±13.89
Avoidance	45.24±13.16
ADHS – Total	40.45±10.63
Pathway	20.18±5.49
Agency	20.27±6.64
ISMI - Total	60.37±13.85
Alienation	12.65±4.08
Stereotypes endorsement	13.26±3.93
Perceived discrimination	10.02 ± 3.47
Social withdrawal	12.25±3.70
Stigma resistance	12.53±2.61
Novelty Seeking	97.04±10.88
Harm Avoidance	109.80±19.40
Reward Dependence	95.68±9.95
Persistence	105.20±17.36
Self-directedness	133.70±15.44
Cooperativeness	126.60±12.71
Self-transcendence	72.05±15.97
Antipsychotic index (calculated to risperidone daily dose) (n=57)	5.79±3.96
Antidepressant index (calculated to paroxetine daily dose) (n=25)	29.40±13.72
Anxiolytic index (calculated to diazepam daily dose) (n=8)	9.38±4.17

Abbreviations: ISMI, Internalized Stigma of Mental Illness; objCGI-S: objective (clinician) evaluation of Clinical Global Impression – Severity scale; subjCGI-S: subjective (patient) evaluation of CGI – Severity scale.

The primary diagnosis was schizophrenia spectrum disorder in all 57 patients (31 were diagnosed with schizophrenia, 9 with schizoaffective disorder, 3 with delusional disorder, 14 with acute and transient psychotic disorders). Two patients suffered from a comorbid personality disorder and five patients had comorbid substance abuse disorder.

Patients displayed mild symptoms of depression in average (Ociskova *et al.* 2017). Their mean total score of anxiety was also mild (Kamaradova *et al.* 2015) (Table 1). The outcomes of the TCI-R, which evaluate the temperament and character personality traits,

are shown in Table 1. In comparison with the Czech norms, the sample showed the normal mean level of RD (percentile 40 to 45), SD (40–45 percentile), CO (55 percentile) and ST (percentile 55). The degree HA was significantly higher than that given norm (80–85 percentile). The average rate of NS and PS were noticeably lower in comparison with norms (NS: 35–40 percentile; and PS: 30–35 percentile) (Preiss & Klose 2001). Regarding ADHS, mean score corresponds to the 3rd sten of standards, which means a meager rate of hope (Ociskova *et al.* 2016).

Tab. 2. Correlation coefficients and statistical significance between PANSS subscores, and demographic, clinical and psychological factors.

FINDING	correlation coefficient with PANSS P1-7	correlation coefficient with PANSS N1-7	correlation coefficient with PANSS G1-16
Age	0.15 ^P	0.09 ^P	0.18 ^P
Onset of the disorder	-0.20 ^P	-0.19 ^P	-0.30 ^{P*}
Number of hospitalizations	0.36 ^{S**}	0.43 ^{S***}	0.51 ^{S***}
Length of the treatment	-0.31 ^{S*}	0.34 ^{S**}	0.40 ^{S**}
objCGI-S	0.78 ^{S***}	0.66 ^{S***}	0.89 ^{S***}
subjCGI-S	0.53 ^{S***}	0.43 ^{S***}	0.62 ^{S***}
BDI-II	0.26 ^{P(0.051)}	0.34 ^{P**}	0.42 ^{P**}
BAI	0.53 ^{P***}	0.32 ^{P*}	0.62 ^{P***}
LSAS-Total	0.30 ^{P*}	0.40 ^{P**}	0.41 ^{P**}
Fear	0.31 ^{P*}	0.43 ^{P**}	0.44 ^{P***}
Avoidance	0.27 ^{P*}	0.34 ^{P*}	0.36 ^{P**}
PANSS Total	0.79 ^{P***}	0.73 ^{P***}	0.96 ^{P***}
ADHS - Total	-0.06 ^P	-0.28 ^{P*}	-0.18 ^P
Pathway	-0.05 ^P	-0.28 ^{P*}	-0.20 ^P
Agency	-0.05 ^P	-0.24	-0.13 ^P
ISMI - Total	0.41 ^{P**}	0.39 ^{P**}	0.47 ^{P***}
Alienation	0.36 ^{P**}	0.39 ^{P**}	0.40 ^{P**}
Stereotypes endorsement	0.43 ^{P***}	0.28 ^{P*}	0.40 ^{P***}
Perceived discrimination	0.29 ^{P*}	0.28 ^{P*}	0.41 ^{P**}
Social withdrawal	0.36 ^{P**}	0.38 ^{P**}	0.41 ^{P**}
Stigma resistance	-0.06 ^P	-0.15 ^S	-0.13 ^P
Novelty Seeking	-0.11 ^P	0.08 ^S	-0.05 ^P
Harm Avoidance	0.24 ^P	0.47 ^{P***}	0.36 ^{P**}
Reward Dependence	0.14 ^P	0.01 ^P	0.02 ^P
Persistence	0.07 ^P	-0.36 ^{P**}	-0.13
Self-directedness	-0.26 ^{P*}	-0.48 ^{P***}	-0.40 ^{P**}
Cooperativeness	-0.28 ^{P*}	-0.47 ^{P***}	-0.30 ^{P*}
Self-transcendence	0.09 ^P	-0.05 ^P	0.11 ^P
Antipsychotic index (n=57)	0.41 ^{S**}	0.36 ^{S**}	0.43 ^{S***}
Antidepressant index (n=25)	-0.21 ^P	0.13 ^P	0.02 ^P

Abbreviations: P=Pearson r; S=Spearman r, *0.05; **0.01; ***0.001

Correlation analysis

Positive symptomatology correlations. Positive symptoms measured by PANSS P1-7 statistically significantly positively correlated with number of hospitalizations, severity of the disorder measured by both objCGI-S and subjCGI-S, severity of general anxiety measured by BAI, severity of social anxiety measured by LSAS-Total, self-stigma measured by ISMI, and antidepressant index, negatively with length of the treatment, hope measured by ADHS, adherence measured by DAI-10, stigma resistance, and personality traits Self-directedness, and Cooperativeness (Table 2).

Negative symptomatology correlations. Negative symptom scores measured by PANSS N1-7 statistically significantly positively correlated with number of hospitalizations, length of the treatment, obj and subCGI-S, BDI-II, BAI, LSAS-Total, ISMI total and all subscales of ISMI except Stigma resistance, and with HA, negatively with ADHS-Total and its subscale Pathway, and with PS, CO (Table 2).

General psychopathological items correlations. G1-16 PANSS items significantly positively correlated with the number of hospitalizations, the length of the treatment, objCGI-S, and subjCGI-S, BDI-II, BAI, LSAS-Total with both subscales, ISMI-Total and its subscales except Stigma resistance, personality traits HA, and antipsychotic index. G1-16 PANSS items significantly negatively correlated with the onset of the disorder and personality traits SD and CO (Table 2).

Comorbidity with anxiety disorders, and positive or negative symptoms

The subgroup of patients with anxiety disorder comorbidity was not statistically significantly different in the mean PANSS-Total score or any of subscores of PANSS from the subgroup without comorbidity with an anxiety disorder (Table 3). Nevertheless, when comparing subgroup of patients with comorbid social phobia with subgroup without social phobia, there were several sta-

tistically significant differences: in mean PANSS-Total score, mean score of negative symptoms (N1-7), and an average rating of general psychopathological items (G1-16) (Table 3).

Comorbidity with depressive disorder, and positive or negative symptoms

The subgroup of patients with comorbidity with the depressive disorder was statistically significantly different in the mean PANSS-Total score, negative symptomatology subscale (N1-7) and general psychopathological items (G1-16) but not in positive symptomatology subscale (P1-7) (Table 3).

DISCUSSION

The study asks the questions of the interrelation between positive and negative symptoms and another clinical and psychological variables in stabilized schizophrenic outpatients. Built on the theoretical background described in the Introduction, several hypotheses were designated.

In the first hypothesis, there was expected that both severities of positive and negative symptoms of schizophrenia would correlate with several parameters and according to research result, both types of schizophrenic psychopathology positively correlated with the length of the disorder, global severity of the disorder, the severity of the general and social anxiety symptoms, the severity of self-stigma, and negatively with personality traits SD and CO. All these partial hypotheses have been confirmed. Lower scores of SD and CO correlated with positive symptoms also in the other studies (Hori *et al.* 2008; Guillem *et al.* 2002; Smith *et al.* 2008).

In the second hypothesis, the study protocol proposed, that only severity of negative symptoms significantly positively correlate with the severity of depressive symptoms and personality trait Harm-avoidance and negatively with the hope and personality trait Persis-

Tab. 3. Comparison of the mean total score and subscores of PANSS in patient with and without comorbid anxiety disorders, with and without comorbid social phobia and with and without comorbid depressive disorder.

	PANSS-Total	P 1-7	N 1-7	G 1-16
Without anxiety disorder (n=12)	57.08±13.69	10.50±2.43	15.58±4.94	31.00±7.98
With anxiety disorder (n=45)	60.13±13.11	11.62±3.35	15.76±4.77	32.76±7.35
Unpaired t test	t=0.7098 df=55; n.s.	t=1.083 df=55; n.s.	t=0.1103 df=55; n.s.	t=0.7227 df=55; n.s.
Without social phobia (n=40)	56.53±12.21	10.88±3.01	14.85±4.43	30.80±7.19
With social phobia (n=17)	66.47±13.03	12.59±3.37	17.76±5.03	36.12±6.84
Unpaired t test	t=2.759 df=55; p<0.01	t=1.895 df=55; n.s.	t=2.183 df=55; p<0.05	t=2.590 df=55; p<0.05
Without depression (n=43)	56.79±12.14	10.98±2.98	14.95±4.53	30.86±6.96
With depression (n=14)	67.79±13.13	12.64±3.61	18.07±4.88	37.07±7.12
Unpaired t test	t=2.886 df=55; p<0.01	t=1.725 df=55; n.s.	t=2.198 df=55; p<0.05	t=2.883 df=55; p<0.01

tence. Also, the second hypothesis was confirmed in all points – negative symptoms but not positive symptoms significantly correlated with designated factors. The result is reinforced by the fact that the severity of the positive symptoms does not correlate with either hope, depression or HA. It suggests the possible specific significance of negative symptoms for patient maladaptation by avoidance, passive behavior, isolation, and decreasing the motivation to change. According to the study of Bliksted *et al.* (2017), high levels of negative symptoms were also associated with poor social cognition.

The third hypothesis suggested that patients with a comorbid anxiety disorder will have higher positive symptomatology than patients without such comorbidity. This hypothesis was not confirmed in our study. The comorbidity of any anxiety disorder had no impact on positive, negative or general psychopathological items. However, when we divided the group into two subgroups according to the presence of social phobia comorbidity, the results showed, that presence of social phobia is related to statistically significantly higher mean scores on the total score of schizophrenic symptomatology, negative subscale average rating and general psychopathological items.

The fourth hypothesis proclaimed that patient with comorbid depression would experience a higher level of negative symptomatology than patients without such comorbidity. This hypothesis was confirmed.

Limitations of the study

Several problems limit the generalization of the results of the survey. The study was done at one outpatient clinic, and therefore the sample of the patients could not reflect the general schizophrenia patients' population. On the other hand, the other investigation, which was made in several outpatient psychiatric health centers, had comparable clinical and demographic structure of the patients.

Another limit of the study is the design because a cross-sectional investigation could not clarify the causatives of the correlations, which can be multiple. To decrease this limitation was done by regression analysis that excluded collinear factors. Nevertheless, it is needed to know the limits of such statistical evaluation with a quite small number of patients. However, the most outcomes are by the results of other investigation in a related area.

Other limits of the investigation may be done by using several self-rated scales and questionnaires, which we are reliant on the patient's introspection ability, motivation, and tiredness which is particularly important in the patients with schizophrenia due to the disorder and drug treatments. However, the objective evaluation of the severity of symptoms measured by psychiatrist rate scale PANSS significantly correlates with the self-rating scales. The question is, if the response to the inventories, especially the personality inventories, is reliable

among patients with psychotic disorders. There is only one study, which has reported internal consistency of personality traits among patients with psychotic disorders filling in TCI questionnaire (Jengic *et al.* 2008). The data of one hundred and twenty-two patients with paranoid schizophrenia were analyzed with the TCI, with Cronbach's alfa values ranging from 0.16 to 0.77 for the four temperaments (HA 0.77, NS 0.66, RD 0.30, PS 0.16) and 0.84 to 0.89 for the three measurements of character. This suggests that the use of TCI as a questionnaire rating individual differences in personality among patients with schizophrenia spectrum disorder is suboptimal in two temperamental dimensions (RD and PS).

Another limitation is caused by the fact that patients were treated with different antipsychotic drugs. It is impossible to rule out the possible effect of the different treatment on the severity of the evaluated symptoms.

This investigation may be seen as a pilot study that suggests the option of additional studying of the effect of different clinical, psychological, and social impacts on the psychopathology of the people with the schizophrenia spectrum disorders.

CONCLUSIONS

This study makes available a comprehensive summary of the associations between several important variables relevant for schizophrenia spectrum disorders, like positive and negative symptoms, hope, self-stigma, personality traits, and comorbid social phobia or depression. The main findings of the present study were two: first, the positive and negative symptoms highly correlated with the severity of anxiety symptoms including social anxiety, self-stigma and negatively with the character dimensions SD and CO. Secondly, the negative symptoms only correlated negatively with hope and depression. Research implications include the need to investigate determinants of consequences of social anxiety and comorbid social phobia, and the sequence of influences exerted by positive and negative symptoms. Clinical implications include the importance of interventions against self-stigma.

Disclosure: *The authors report no conflicts of interest.*

REFERENCES

- 1 American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders, Fifth Ed. DSM-5. Arlington: American Psychiatric Association.
- 2 Asukai N, Kato H, Kawamura N, Kim Y, Yamamoto K, Kishimoto J, Miyake Y, Nishizono-Maher A (2002). Reliability and validity of the Japanese-language version of the impact of event scale-revised (IES-R-J): four studies of different traumatic events. *J Nerv Ment Dis*; **190**: 175–182.
- 3 Baker SL, Heinrichs N, Kim HJ, Hofmann SG (2002). The Liebowitz Social Anxiety Scale as a self-report instrument: a preliminary psychometric analysis. *Behav Res Ther.* **40**: 701–715.

- 4 Beck AT, Epstein N, Brown G, Steer RA (1988). An Inventory for Measuring Clinical Anxiety: Psychometric Properties. *J Consult Clin Psychol.* **56**: 893–897.
- 5 Beck AT, Steer RA, Ball R & Ranieri W (1996). Comparison of Beck Depression Inventories -I and -II in psychiatric outpatients. *J Pers Assess.* **67**: 588–597.
- 6 Beck JG, Grant DM, Read JP, Clapp JD, Coffey SF, Miller LM, Palyo SA (2008). The impact of event scale-revised: psychometric properties in a sample of motor vehicle accident survivors. *J Anxiety Disord.* **22**: 187–198.
- 7 Bliksted V, Videbech P, Fagerlund B, Frith C (2017). The effect of positive symptoms on social cognition in first-episode schizophrenia is modified by the presence of negative symptoms. *Neuropsychology.* **31**: 209–219.
- 8 Boeker H, Kleiser M, Lehman D, Jaenke L, Bogerts B, Northoff G (2006). Executive dysfunction, self, and ego pathology in schizophrenia: an exploratory study of neuropsychology and personality. *Compr Psychiatry.* **47**: 7–19.
- 9 Bora E, Veznedaroglu B (2007). Temperament and character dimensions of the relatives of schizophrenia patients and controls: the relationship between schizotypal features and personality. *European Psychiatry.* **22**: 27–31.
- 10 Boyd JE, Adler EP, Otilingam PG, Peters T (2014). Internalized Stigma of Mental Illness (ISMI) Scale: A multinational review. *Compr Psychiatry.* **55**: 221–231.
- 11 Brewin CR (2005). Systematic review of screening instruments for adults at risk of PTSD. *J Trauma Stress.* **18**: 53–62.
- 12 Cavelti M, Kvgic S, Beck E, Rüsck NA, Vauth R (2011). Self-stigma and its relationship with insight, demoralization, and clinical outcome among people with schizophrenia spectrum disorders. *Comprehensive Psychiatry.* **53**: 468–479.
- 13 Ceskova E, Prikryl R, Pec O (2014). Schizofrenie u dospělých. In: Raboch J, Uhlíkova P, Hellerova P, Anders M, Susta M, editors. *Psychiatrie. Doporučené postupy psychiatrické péče IV [Psychiatrie. Recommended practices in psychiatric care IV]. Psychiatrická společnost ČSL JEP*; 44–51.
- 14 Christianson S, Marren J (2012). The Impact of Event Scale – Revised (IES-R). *Medsurg Nurs.* **21**: 321–322.
- 15 Cloninger CR, Dragan M, Svrakić DM (2009). Personality Disorders. In Kaplan & Shaddock's *Comprehensive Textbook of Psychiatry*. Sadock, BJ & Sadock, VA (Eds.) Philadelphia: Lippincott Williams & Wilkins. **2**: 4520: 2197–2241.
- 16 Cloninger CR, Svrakić DM, Przybeck TR (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry.* **50**: 975–990.
- 17 Cloninger CR (1986). A unified biosocial theory of personality and its role in the development of anxiety states. *Psychiatric Developments.* **3**: 167–226.
- 18 Cloninger CR (1994). *The Temperament and Character Inventory (TCI) – A guide to its development and use*. St. Louis, Missouri: Centre for Psychobiology of Personality.
- 19 Cortés MJ, Valero J, Gutiérrez-Zotes JA, Hernández A, Moreno L, Jarrod M, Martorell L, Vilella E, Labad A (2009). Psychopathology and personality traits in psychotic patients and their first-degree relatives. *Eur Psychiatry.* **24**: 476–482.
- 20 Creamer M, Bell R, Failla S (2003). Psychometric properties of the Impact of Event Scale—Revised. *Behav Res Ther.* **41**: 1489–1496.
- 21 Domino G, Domino ML (2006). *Psychological testing: An introduction*. Cambridge University Press.
- 22 EMEA, 2002: <http://www.ema.europa.eu/pdfs/human/ich/013595en.pdf>. 20.3.2009.
- 23 Farmer RF & Goldberg LR (2008). A psychometric evaluation of the revised Temperament and Character Inventory (TCI-R) and the TCI-140. *Psychological assessment.* **20**: 281.
- 24 Fresán A, León-Ortiz P, Robles-García R, Azcárraga M, Guizar D, Reyes-Madriral F, Tovilla-Zárate CA, de la Fuente-Sandoval C (2015). Personality features in ultra-high risk for psychosis: a comparative study with schizophrenia and control subjects using the Temperament and Character Inventory-Revised (TCI-R). *J of Psych Research.* **61**: 168–173
- 25 Fresco DM, Coles ME, Heimberg RG, Liebowitz MR, Hami S, Stein MB, Goetz D (2001). The Liebowitz Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats. *Psychol Med.* **31**: 1025–1035.
- 26 Gaebel W, Zäske H, Baumann AE, Klosterkötter J, Maier W, Decker P, Möller HJ (2008). Evaluation of the German WPA „program against stigma and discrimination because of schizophrenia-Open the Doors”: results from representative telephone surveys before and after three years of antistigma interventions. *Schizophr Res.* **98**: 184–193.
- 27 Gerlinger G, Hauser M, De Hert M, Lacluyse K, Wampers M, Correll CU (2013). Personal stigma in schizophrenia spectrum disorders: a systematic review of prevalence rates, correlates, impact and interventions. *World Psychiatry.* **12**: 155–164.
- 28 Gillespie NA, Cloninger CR, Heath AC & Martin NG (2003). The genetic and environmental relationship between Cloninger's dimensions of temperament and character. *Personality and Individual Differences.* **35**: 1931–1946.
- 29 Gonzalez-Torres MA, Inchausti L, Ibáñez B, Aristegui M, Fernández-Rivas A, Ruiz E, Fernandez E, Bayón C (2009). Temperament and character dimensions in patients with schizophrenia, relatives, and controls. *The Journal of Nervous and Mental disease.* **197**: 514–519.
- 30 Guillem F, Bicu, M, Semkovska M, Debrulle JB (2002). The dimensional symptom structure of schizophrenia and its association with temperament and character: *Schizophrenia Research.* **56**: 137–147.
- 31 Guy W (ed.) (1976). *ECDEU Assessment manual for psychopharmacology*. Rockville, U.S. DHEW.
- 32 Hanzawa S, Nosaki A, Yatabe K, Nagai Y, Tanaka G, Nakane H, Nakane Y (2012). Study of understanding the internalized stigma of schizophrenia in psychiatric nurses in Japan. *Psychiatry Clin Neurosci.* **66**: 113–120.
- 33 Hori H, Noguchi H, Hashimoto R, Nakabayashi T, Saitoh O, Murray RM, Okabe S, Kunugi H (2008). Personality in schizophrenia assessed with the Temperament and Character Inventory (TCI). *Psychiatry Research.* **160**: 175–183.
- 34 Horowitz M, Wilner N, Alvarez W (1979). Impact of Event Scale: a measure of subjective stress. *Psychosom Med.* **41**: 209–218.
- 35 Hulbert CA, Jackson HJ, McGorry PD (1996). Relationship between personality and course and outcome in early psychosis: A review of the literature. *Clin Psychology Review.* **16**: 707–727.
- 36 Jengic VS, Jonovska S, Boskovic G, Pavelic MS (2008). The influence of temperament and character of psychotic individuals on the possibility of committing criminal offenses. *Coll Anthropol.* **32**: 1179–1187.
- 37 Kamaradova D, Latalova K, Prasko J, Kubinek R, Vrbova K, Mainerova B, Cinculova A, Ociskova M, Holubova M, Smoldasova J, Tichackova A (2016). Connection between self-stigma, adherence to treatment, and discontinuation of medication. *Patient Preference and Adherence.* **10**: 1289–1298.
- 38 Kamaradova D, Prasko J, Latalova K, Panackova L, Svancara J, Grambal A, Sigmundova Z, Ociskova M, Bares V, Cakirpaloglu S, Jelenova D, Kasalova P, Kovacsova A, Vrbova K (2015). Psychometric properties of the Czech version of the Beck Anxiety Inventory – comparison between diagnostic groups. *Neuro Endocrinol Lett.* **36**: 706–712.
- 39 Kay SR, Fiszbein A, Opler LA (1987). The Positive and Negative Syndrome Scale (PANSS) for Schizophrenia. *Schizophr Bull.* **13**: 261–276.
- 40 Kurs R, Farkas H, Ritsner M (2005). Quality of life and temperament factors in schizophrenia: comparative study of patients, their siblings, and controls. *Quality of Life Research.* **14**: 433–440.
- 41 Liebowitz MR (1987). Social phobia. *Modern Problems of Pharmacopsychiatry.* **22**: 141–173.
- 42 Livingston JD & Boyd JE (2010). Correlates and consequences of internalized stigma for people living with mental illness: A systematic review and meta-analysis. *Social Science & Medicine.* **71**: 2150–2161.
- 43 Lysaker PH, Bell MD, Kaplan E, Bryson G (1998). Personality and psychosocial dysfunction in schizophrenia: the association of extraversion and neuroticism to deficits in work performance. *Psychiatry Res.* **80**: 61–68.

- 44 Margetić BA, Jakovljević M, Ivanec D, Margetić B, Tošić G (2010). Relations of internalized stigma with temperament and character in patients with schizophrenia. *Compr Psychiatry*. **51**(6): 603–606.
- 45 Mezinárodní klasifikace nemocí – 10. revize (1996). MKN-10 (1. vydání); Maxdorf Praha.
- 46 Mezzich JE, Salloum IM, Cloninger RC, Salvator-Carulla, Kirmayer LJ, Banzato CEM, Wallcraft J, Botbol M (2010): Person-centered Integrative Diagnosis: Conceptual Bases and Structural Model. *Canadian Journal of Psychiatry*. **55**: 701–708.
- 47 Mitra S, Mahintamani T, Kavoor AR, Nizamie SH (2016). Negative symptoms in schizophrenia. *Ind Psychiatry J*. **25**: 135–144.
- 48 Ociskova M, Prasko J, Kamaradova D, Grambal A, Kasalova P, Sigmundova Z, Latalova K, Vrbova K (2015). Coping strategies, hope, and treatment efficacy in pharmacoresistant inpatients with neurotic spectrum disorders. *Neuropsychiatr Dis Treat*. **11**: 1191–1201.
- 49 Ocisková M, Praško J, Kamarádová D, Látalová K, Kurfürst P, Dostálová L, Cinculová A, Kubínek R, Mainierová B, Vrbová K, Ticháčková A (2014). Self-stigma in psychiatric patients--standardization of the ISMI scale. *Neuro Endocrinol Lett*. **35**: 624–632.
- 50 Ociskova M, Prasko J, Kupka M, Marackova M, Latalova K, Cinculova A, Grambal A, Kasalova P, Krnacova B, Kubinek R, Sigmundova Z, Tichackova A, Vrbova K (2017). Psychometric evaluation of the Czech Beck Depression Inventory-II in a sample of depressed patients and healthy controls. *Neuro Endocrinol Lett*. **38**: 98–106.
- 51 Ocisková M, Sobotková I, Praško J, Mihál V (2016). Standardization of the Czech version of the Snyder's Adult Dispositional Hope Scale. [Standardizace české verze Snyderovy škály naděje pro dospělé. Psychologie a její kontexty. In Czech language]. *7*: 109–123.
- 52 Preiss M & Vacíř K (1999). Beckova sebeposuzovací škála deprese pro dospělé. BDI-II. Příručka. Brno: Psychodiagnostika.
- 53 Preiss M & Klose J (2001): Diagnostika poruch osobnosti pomocí teorie C. R. Cloningera. *Psychiatrie*. **5**: 226–231.
- 54 Remington G, Foussias G, Fervaha G, Agid O, Takeuchi H, Lee J, Hahn M (2016). Treating Negative Symptoms in Schizophrenia: an Update. *Curr Treat Options Psychiatry*. **3**: 133–150.
- 55 Ritsher JB, Otilingam PO, Grajales M (2003). Internalized stigma of mental illness: Psychometric properties of a new measure. *Psychiatry Research*. **121**: 31–49.
- 56 Rüsç N, Corrigan PW, Powell K, Rajah A, Olschewski M, Wilkniss S, Batia K (2009). A stress-coping model of mental illness stigma: II. Emotional stress responses, coping behavior and outcome. *Schizophr Res*. **110**: 65–71.
- 57 Schrank B, Amering M, Hay AG, Weber M, Sibitz I (2014). Insight, positive and negative symptoms, hope, depression, and self-stigma: a comprehensive model of mutual influences in schizophrenia spectrum disorders. *Epidemiol Psychiatr Sci*. **23**: 271–279.
- 58 Schulze B & Angermeyer MC (2003). Subjective experiences of stigma: A focus group study of schizophrenic patients, their relatives, and mental health professionals. *Social Science and Medicine*. **56**: 299–312.
- 59 Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. **59** (Suppl 20): 22–33.
- 60 Sirey JA, Bruce ML, Alexopoulos GS, Perlick DA, Raue P, Friedman SJ, Meyers BS (2001). Perceived stigma as a predictor of treatment discontinuation in young and older outpatients with depression. *Am J Psychiatry*. **158**: 479–481.
- 61 Smith MJ, Cloninger CR, Harms MP, Csernansky JG (2008). Temperament and character as schizophrenia-related endophenotypes in non-psychotic siblings. *Schizophrenia Research*. **104**: 198–205.
- 62 Snyder CR (Ed.) (2000). *Handbook of Hope: Theory, Measures, & Applications*. New York: Academic Press.
- 63 Snyder CR, Rand KL, Sigmon DR (2002). Hope theory: A member of positive psychology family. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 257–276). New York: Oxford University Press.
- 64 Wahl OF (1999). Mental health consumers' experience of stigma. *Schizophrenia Bulletin*. **25**: 467–478.
- 65 Wang XQ, Petrini MA, Morisky DE (2016). Predictors of quality of life among Chinese people with schizophrenia. *Nurs Health Sci*. doi: 10.1111/nhs.12286. [Epub ahead of print]
- 66 Watson AC, Corrigan PW, Larson JE, Sells M (2007). Self-stigma in people with mental illness. *Schizophrenia Bulletin*. **33**: 1312–1318.
- 67 Weiss DS & Marmar CR (1997). The Impact of Event Scale—Revised. In: Wilson JP, Keane TM, editors. *Assessing psychological trauma and PTSD*. New York (NY): Guilford Press; 399–411.
- 68 World Health Organization (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.
- 69 World Medical Association (2013). WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. Ferny-Voltaire, France: WMA; <http://www.wma.net/en/30publications/>
- 70 Yanos PT, Roe D, Lysaker PH (2010). The impact of illness identity on recovery from severe mental illness. *Am J Psychiatr Rehabil*. **13**: 73–93.
- 71 Yanos PT, Roe D, Markus K, Lysaker PH (2008). Pathways between internalized stigma and outcomes related to recovery in schizophrenia spectrum disorders. *Psychiatric Services*. **59**: 1437–1442.
- 72 Yen CF, Chen CC, Lee Y, Tang TC, Ko CH, Yen JY (2009). Association between quality of life and self-stigma, insight, and adverse effects of medication in patients with depressive disorders. *Depress Anxiety*. **26**: 1033103–9.