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# Autistic, schizotypal traits, and insight level in patients with obsessive–compulsive disorder

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## Abstract

**Background** Comorbid personality disorders and obsessive–compulsive disorder (OCD) range between 33 and 87%. Patients having OCD more commonly receive cluster A (the odd and eccentric cluster) compared with other nonpsychotic patients. Poor insight levels within OCD increase disease severity and impair neuropsychological factors, where OCD patients exhibit poorer speech learning and memory.

**Objectives** To assess schizotypal, autistic traits, and insight levels in patients with OCD.

**Methods** Forty subjects with OCD were recruited from outpatient clinics of Kasr Alainy Psychiatry and Addiction Prevention Hospital and assessed using the Dimensional Yale-Brown Obsessive–Compulsive Scale (DYBOCS), Schizotypal Personality Questionnaire–Brief Revised (SPQ-BR), and Autism Spectrum Quotient (AQ) while insight level was assessed using Brown Assessment of Beliefs Scale (BABS).

**Results** Total DY-BOCS score was positively correlated with the AQ score and SPQ score. Global distress and interference subdomains of DY-BOCS were positively correlated with AQ, SPQ score, and Insight level (BABS). Indicating that the worse the insight the higher the distress and interference in daily life. Global distress and interference were also positively correlated to all subscales of SPQ. Aggressive obsessions were correlated with SPQ score, cognitive-perceptual (CP) traits, ideas of reference, and magical thinking. Contamination/cleaning obsessions were positively correlated with the level of insight (BABS). While sexual and religious obsessions were negatively correlated with the level of insight.

**Conclusion** Increased severity of OCD is associated with more autistic symptoms, schizotypal symptoms, and poorer insight. No gender differences in OCD patients regarding severity, autistic symptoms, schizotypal symptoms, or insight.

**Keywords** OCD, Autism, Schizotypy, Insight

## Introduction

Obsessive–compulsive disorder (OCD) is a challenging chronic condition that is highly versatile in symptom profile and severity. This variability can be challenging

in long and short-term treatment goals and pleads for a more personalized approach to treatment. Exploring the dimensional aspect of OCD as well as comorbid personality disorders and insight levels can be helpful in better understanding the complexity that arises from such comorbidities.

Obsessive–compulsive disorder (OCD) is more prevalent in adult females than in adult males, affecting 1.5% of women and 1.0% of men [1, 2]. While most symptoms are manageable by treatment, most patients experience an uninterrupted symptom course, with up to 25% displaying a waxing and waning pattern [3, 4].

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Core symptoms of Autism spectrum disorders include impairments in social interactions and communication, often accompanied by restricted, repetitive, or stereotyped interests and behaviors. Other dimensions that are usually affected are attention-switching problems, attention to detail, and lack of imagination [5].

Even though obsessive-compulsive disorder (OCD) and autism spectrum disorder (ASD) are two well-defined and separate disorders [6], they have high mutual comorbidity and they share more similarities than differences [5]. Rigid and recurrent patterns of behavior and compulsivity are similar in both diseases. Nevertheless, some differences can be spotted, for instance, patients with OCD feel compelled to do a specific ritualistic behavior in the same way to ease anxiety. On the other hand, patients with autism engage in a variety of repetitive behaviors and not necessarily the same one each time [7].

Approximately 30% of patients with OCD exhibit schizotypal traits [8]. SPD is characterized by social and relationship deficits, as well as cognitive or perceptual abnormalities and eccentric behavior [9]. A non-specific proneness to psychosis has been envisioned as SPD.

A high subset of clinically diagnosed OCD patients meet the diagnostic criteria for a schizophrenia spectrum disorder; this may support the prevalence and clinical importance of a psychotic-obsessive spectrum of disorders, such as schizotypal personality disorder (SPD) with OCD (schizotypal OCD) [10].

Poor insight levels within OCD are associated with a worse prognosis and a more severe presentation of symptoms. Those with poor insight fall closer to the psychotic end of the obsessive-overvalued ideas-delusions spectrum. Patients with OCD typically experience fluctuating insight and investigating it could further our understanding of OCD's psychopathology [11, 12].

The aim of this work was to assess the presence of schizotypal traits, and autistic traits in patients with OCD as well as assess the patients' insight level. We also aimed to explore the correlation of these assessments with the severity of OCD.

## Methods

This was an observational, descriptive, cross-sectional study with a convenient sample. The sample size calculation was completed using PASS software, considering  $\alpha$  error = 0.05 and power = at least 0.8 to detect  $n$  effect size of  $n = 40$ , according to a previous study [13]. Forty patients diagnosed with obsessive-compulsive disorder according to DSM-5 [6] were recruited from the outpatient clinic of Kasr Al Ainy Psychiatry and Addiction Prevention Hospital, Cairo University. The diagnosis of OCD was done by the researcher and was confirmed by

two consultants. All patients accepted to participate and signed written informed consent.

Both sexes were eligible, patients were aged 18–55, with at least 6 years of formal education and clinically average intelligence.

Patients meeting the diagnostic criteria of any other major psychiatric or substance use disorders according to DSM-5—apart from personality disorders—were excluded. Also, patients with a history of head injury, history of organic brain disease, or history of neurological illness that can influence social cognition were excluded.

All the recruited patients were subjected to the Dimensional Yale-Brown Obsessive-compulsive scale (DYBOCS), Autism Spectrum Quotient (AQ), Schizotypal Personality Questionnaire-Brief Revised (SPQ-BR), and Brown Assessment of Beliefs Scale (BABS).

The DYBOCS [14], the Arabic version used [15] consists of semi-structured scales for assessing both the presence and severity of obsessive-compulsive symptom dimensions. The DY-BOCS is a self-report scale that is composed of 88 items that provide a comprehensive explanation of obsessions and compulsions divided into six different OC symptom dimensions: harm due to aggression, sexual/moral/, symmetry, contamination and hoarding, and other miscellaneous obsessions and compulsions that relate to bodily concerns and superstitions. The DY-BOCS also measures global time (time taken per day by the OCD), global distress (amount of distress caused by the OCD), global interference (the amount of interference with daily life activities), impairment (total function impairment), and the total DY-BOCS severity score (which is the addition of the aforementioned 4 categories).

The AQ: [16], Arabic version is a 50-item self-report questionnaire assessing traits of autism in adults with normal IQ. It is a four-point Likert response dichotomized in the original AQ to yield a binary score for each item. We employed four-point scores to enhance scale reliability [17]. The AQ consists of five subscales: communication ( $\alpha = 57$ ), social skills ( $\alpha = 77$ ), attention switching ( $\alpha = 6$ ), imagination ( $\alpha = 6$ ), and attention to detail ( $\alpha = 7$ ). These values of  $\alpha$  are classic of AQ subscales owing mainly to reduced items in each subscale [17, 18].

The SPQ-BR: [19] was translated and back-translated to Arabic by the researchers after getting permission from the authors (Farouk M, Nasr M, Khalil M, and Ayoub D. R.). The SPQ-BR is a 32-item version [20] of the original SPQ [21]. The test consisted of three super-ordinate factors, namely, positive (Cognitive-Perceptual (CP), negative (Interpersonal (IP), and disorganized (DO). The scale has seven subordinate factors reflecting key facets of schizotypal personality traits (lower-order factors). Cognitive Perceptual consists of (Ideas of Reference/Suspiciousness

(IR/SU), Magical Thinking (MT), and Unusual Perceptions (UP)). The Interpersonal consists of (No Close Friends/Constricted Affect (CF/CA) and Social Anxiety (SA)), and the Disorganized (Eccentric Behavior (EB) and Odd Speech (OS)). Taking into account the nature of social anxiety within schizotypy in comparison to normal variance in a healthy volunteer, Social Anxiety was confirmed to be a distinct 4th factor rather than an indicator of Interpersonal schizotypy.

The researchers also performed the validity and reliability of the SPQ-BR Arabic version. It is known that the SPQ total is the sum of the following measures: IR/SU, MT, UP, CFCA, SA, EB, and OS. Then, the correlation between the SPQ total and the above seven measures is given by the following Table 1.

Since the correlation between SPQ-BR and all the measures used to get it is highly significant ( $P$  value = 0.000 < 0.01), then SPQ-BR is a valid instrument. To check the reliability of the SPQ total, the value of Cronbach's alpha test = 0.864 > 0.6, which means that the instrument SPQ-BR is reliable. Moreover, we found the value of Cronbach's alpha test of some subinstruments as seen in Table 2.

From the above table, it is seen that all the subinstruments: CP total, IP total, and DO total are reliable, since Cronbach's alpha is greater than 6.

The BABS is a 7-item clinician-rated scale that measures insight level/delusionality. It assesses insight depending on the patient's power of belief in delusions and obsessions on a continuous spectrum. Higher scores indicate lower levels of insight [22].

The scale was translated and back-translated to Arabic by the researchers upon the author's permission (Farouk M, Nasr M, Khalil M, and Ayoub D. R.).

The study was approved by the Cairo University Research Ethics Committee (REC) under the number MD-2192020 and conducted following the tenets of the Declaration of Helsinki.

**Statistical analysis**

The data was treated on a laptop using the statistical package for Social Sciences (SPSS-version 25) [23].

**Table 2** Cronbach's alpha test for subinstruments of SPQ total

Subinstrument	Components	Cronbach's alpha
CP total	IRSU, MT, UP	0.663
IP total	CFCA, SA	0.760
DO total	EB, OS	0.840

IR/SU ideas of reference/suspiciousness, CF/CA no close friends/constricted affect, EB eccentric behavior, MT magical thinking, SA social anxiety, OS odd speech, UP unusual perceptions, CP total cognitive-perceptual, IP total interpersonal, DO total disorganized behavior

In this study, we used the following statistical tests: the chi-square ( $\chi^2$ ) test to check the independence between two nominal variables and the Mann–Whitney  $U$  test to examine the equality of the mean of a numerical variable in two different groups. Spearman correlation coefficient ( $r$ ) was used to study the strength and direction of the relationship between two variables. Eta coefficient was used to measure the association between a numerical and a nominal variable Cronbach's alpha to test the reliability of a certain instrument (SPQ-BR). The statistical analysis was based on two-tailed tests using a level of significance for analysis at  $p \leq 0.05$ .

**Results**

The age of patients was (24.58 ± 5.04) and males were 55% of the patients while females were 45% of the patients. Other demographic data are illustrated in Table 3.

Ninety-five percent of the cases using antidepressants, 10% were on mood stabilizers, and 37.5% were on antipsychotics.

Figure 1 shows that sexual/religious obsessions were the most common in the sample as 83.5% of the cases had sexual or religious obsessions. Symmetry and ordering obsessions came second at 60%. Almost 40% of the sample had aggressive, contamination/cleaning, or miscellaneous obsessions. The least common was hoarding and related obsessions at 25%.

All correlation coefficients were positive, which reflected a direct relationship between variables as shown in Table 4.

**Table 1** Correlation between SPQ Total and its subscales

	IR/SU		CF/CA		EB		MT		SA		OS		UP	
	r	P	r	P	r	P	r	P	r	P	r	P	r	P
SPQ Total	.84	.0	.82	.0	.81	.0	.63	.0	.72	.0	.79	.0	.59	.0
	4*	00	8*	00	6*	00	7*	00	1*	00	5*	00	6*	00

IR/SU ideas of reference/suspiciousness, CF/CA no close friends/constricted affect, EB eccentric behavior, MT magical thinking, SA social anxiety, OS odd speech, UP unusual perceptions, CP total cognitive-perceptual, r Pearson correlation coefficient, P P value

\* Correlation is significant at  $p =$  or < 0.05 level

**Table 3** Demographic characteristics of case and control units

	Cases (N=40)
	Number (%)
Sex	
Male	22 (55)
Female	18 (45)
Status	
Currently single	26 (65)
Currently in a relationship	14 (35)
Education	
Preparatory	1 (2.5)
Technical education	1 (2.5)
Main secondary	13 (32.5)
College	25 (62.5)
Occupation	
Not working	29 (72.5)
Working	11 (27.5)

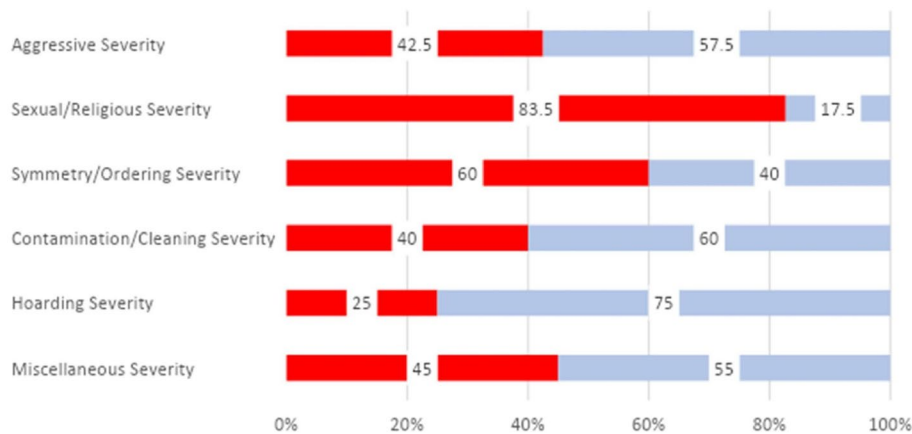
Autism Spectrum Quotient (AQ) was significantly correlated with both schizotypal personality questionnaire total (SPQ total) and BABS) in a positive direction. AQ

showed also a positive correlation with Sexual Religious, Symmetry Ordering, Global Distress, Global Interference, and Total scales of the DY-BOCS Severity Score.

Also, SPQ was also positively correlated with Aggressive Severity, Sexual Religious Severity, Symmetry Ordering Severity, Global Time, Global Distress, Global Interference, Impairment, and Total scales of DY-BOCS Severity Score. Meanwhile, BABS correlated positively with Symmetry Ordering Severity, Contamination Cleaning Severity, Global Distress, and Global Interference scales of DY-BOCS. Age at the onset and duration of illness were not associated with AQ, SPQ, BABS, or DY-BOCS (Tables 5 and 6).

**Discussion**

This research showed no significant differences between females and males regarding age of onset. Males were statistically significantly younger than females at the onset of any OC symptoms in the studies of Fineberg et al. [24] and Jiujiias et al. [25]. Benatti et al. [26] found that females were older, similar to this study.



**Fig. 1** Different dimensions of obsessions in the case group

**Table 4** Correlation between AQ, SPQ, and three superordinate subscales of SPQ and BABS SPQ-CP-total IP-total DO-total BABS total

	r	Sig	r	P	r	P	r	P	r	P
AQ	.722**	.000	.579**	.000	.746**	.000	.617**	.000	.425**	.006
SPQTOTAL			.880**	.000	.862**	.000	.865**	.000	.224	.164
CPTOTAL					.599**	.000	.691**	.000	.137	.398
IPTOTAL							.684**	.000	.278	.083
DOTOTAL									.314*	.049

r Pearson correlation coefficient, P P value, AQ Autism Spectrum Quotient, SPQ Total schizotypal personality questionnaire total, CP Total cognitive-perceptual, IP total interpersonal, DO total disorganized behavior, BABS Brown Assessment of Beliefs Scale

\*Correlation is significant at p= or < 0.05 level

\*\*Correlation is highly significant at p= or < 0.01 level

**Table 5** Correlation between measures of obsession and AQ, Total SPQ, superordinate subscales of SPQ and BABS

	AQ		SPQ total		CP total		IP total		DO total		BABS	
	r	p	r	p	r	p	r	p	r	p	r	p
Aggressive severity	.308	.053	.431**	.006	.495**	.001	.259	.106	.327*	.039	-.036	.827
Sexual/religious severity	.168	.301	.260	.106	.181	.263	.256	.110	.182	.261	-.393*	.012
Symmetry/ordering severity	.400*	.011	.387*	.014	.270	.092	.397*	.011	.449**	.004	.440**	.005
Contamination/cleaning severity	.215	.183	.099	.544	.077	.635	.070	.667	.096	.554	.318*	.045
Hoarding severity	-.007	.965	.108	.506	.083	.611	.109	.504	.088	.588	.062	.705
Miscellaneous severity	.136	.404	.300	.060	.188	.246	.241	.135	.362*	.022	.225	.162
Global time	.125	.443	.317*	.046	.244	.130	.240	.137	.295	.065	.162	.317
Global distress	.446**	.004	.517**	.001	.392*	.012	.467**	.002	.479**	.002	.344*	.030
Global interference	.358*	.023	.372*	.018	.257	.109	.340*	.032	.379*	.016	.339*	.032
Impairment	.267	.096	.429**	.006	.278	.083	.400*	.011	.439**	.005	.207	.200
Total DY-BOCS Severity	.334*	.035	.481**	.002	.333*	.036	.433**	.005	.480**	.002	.279	.081

AQ Autism Spectrum Quotient, SPQ total schizotypal personality questionnaire total, CP total cognitive-perceptual, IP total interpersonal, DO total disorganized behavior, BABS Brown Assessment of Beliefs Scale

\* Correlation is significant at  $p = \text{or} < 0.05$  level

\*\* Correlation is highly significant at  $p = \text{or} < 0.01$  level

**Table 6** Correlation between measures of obsession and subordinate subscales of SPQ

	IR/SU		CF/CA		EB		MT		SA		OS		UP	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p
Aggressive severity	.434*	.005	.264	.100	.280	.081	.350*	.027	.197	.224	.336*	.034	.423**	.007
Sexual/religious severity	.197	.223	.200	.216	.109	.504	.125	.441	.276	.085	.243	.130	.088	.588
Symmetry/ordering severity	.293	.067	.440**	.004	.370*	.019	.177	.275	.255	.113	.478**	.002	.140	.390
Contamination cleaning severity	.038	.815	.123	.448	.122	.453	.060	.713	-.015	.925	.051	.756	.112	.493
Hoarding severity	.129	.428	.021	.898	-.044	.788	-.070	.667	.201	.213	.235	.144	.050	.759
Miscellaneous severity	.167	.303	.347**	.028	.407**	.009	.012	.939	.049	.766	.254	.113	.224	.164
Global time	.180	.266	.258	.108	.281	.079	.284	.076	.164	.313	.268	.095	.192	.235
Global distress	.308	.053	.428**	.006	.449**	.004	.354*	.025	.417**	.007	.444**	.004	.349*	.027
Global interference	.202	.212	.328*	.039	.335*	.034	.248	.123	.282	.078	.375*	.017	.215	.183
Impairment	.224	.165	.392*	.012	.386*	.014	.239	.137	.322*	.042	.437**	.005	.240	.137
Total DY-BOCS Severity	.267	.096	.425**	.006	.423**	.006	.299	.061	.349*	.027	.476**	.002	.283	.076

IR/SU ideas of reference/suspiciousness, CF/CA no close friends/constricted affect, EB eccentric behavior, MT magical thinking, SA social anxiety, OS odd speech, UP unusual perceptions

\* Correlation is significant at  $p = \text{or} < 0.05$  level

\*\* Correlation is highly significant at  $p = \text{or} < 0.01$  level

AQ was similar in males and females in this study. Another study—that included patients with autism using AQ—did not find gender differences [27].

About 10% had a score of 32 or more on AQ indicating a strong likelihood of Asperger’s syndrome or autism. Martin et al. [28] stated that 17–37% of young individuals with OCD might experience some features of autism.

Nevertheless, it is uncertain whether this conjunction represents a shared cause or different causes that are apparent in overlapping phenotypes [29].

Assessing *schizotypal traits* among OCD cases revealed that the schizotypal personality questionnaire had a mean of  $50.65 \pm 28.24$ . Clinical studies have concluded that both OCD and SPD may meet in an

alternate complex clinical phenotype, explicitly; OCD with an attenuated form of schizophrenia, schizotypal personality disorder [30–32].

The SPQ high mean values presented with OCD patients match studies of Callaway and Fonseca-Pedero [33], 20. It also matched the studies of [34]. Two more studies, [35] in which after examining 108 community-dwelling OCD patients, it was discovered that SPD ranked among the most often evaluated personality disorders (24.9%). Additionally, research by Brakoulias et al. [36] looked into 177 OCD individuals and found that 23.2% had high levels of schizotypy, this could be related to the OCD being present on the obsessive-overvalued-psychosis spectrum, hence, some patients showed high levels of schizotypy.

In this study, a positive correlation between autistic traits and all dimensions of schizotypal traits (positive, negative, and disorganized) was discovered. Other studies have concluded that there is an association between autistic and schizotypal personality traits, where autistic-like traits were more positively correlated to negative-schizotypal traits than when compared with positive-schizotypal traits [37].

The insight score (BABS) was  $7.13 \pm 4.94$ , ranging from 0 to 16. It is worth mentioning that the higher the score, the poorer the insight into obsessive symptoms. The scale we used (BABS) has no cut-off score for insight level. One study has revealed that individuals with poor insight were more associated with the use of neuroleptics, high scores in DY-BOCS total and dimensional scores; high levels of depression; and high incidence of bipolar affective disorder [12].

Studying the relationship between autistic traits and insight level revealed a highly significant positive correlation, indicating that the higher the autistic tendency, the higher the BABS score and hence the lower the insight. This was echoed by other studies [5, 38].

An analysis of the link between insight level and schizotypal personality traits found a strong positive correlation between insight level and the SPQs disorganized behavior (DO TOTAL) score. This is consistent with a different study that looked into the relationship between poor insight and SPD; the study found that this was a highly prevalent and clinically relevant problem [39].

Compared to OCD patients without co-occurring SPD, those with co-occurring SPD have been found to have poorer insight and outcomes [40]. It should be mentioned that De Haan et al. [31] found a positive correlation between OCD and positive schizotypal symptoms, but not negative symptoms. Functional impairment and deprived insight were caused by executive dysfunction and memory deficit in OCD patients, and they co-existed with schizotypal traits and over-valued ideas [32, 41].

## Conclusions

The severity of OCD symptoms is associated with Autistic traits, schizotypal traits, and poorer insight. No gender differences in OCD patients regarding OCD severity, autistic symptoms, schizotypal symptoms, or insight.

The results of this study were limited by the relatively few number of included patients. The positive correlation between AQ and SPQ, AQ and Total DY-BOCS Severity Score, and AQ and Total DY-BOCS Severity Score may decrease the significance of each correlation due to multicollinearity.

## Abbreviations

DY-BOCS	Dimensional Yale-Brown Obsessive-compulsive scale
OCD	Obsessive Compulsive Disorder
SPQ	Schizotypal Personality Questionnaire
AQ	Autism Spectrum Quotient
SPQ-BR	Schizotypal Personality Questionnaire-Brief Revised
BABS	Brown Assessment of Beliefs Scale
IR/SU	Ideas of reference/suspiciousness
MT	Magical thinking
UP	Unusual perceptions
CF/CA	Close friends/constricted affect
SA	Social anxiety
EB	Disorganized eccentric behavior
OS	Odd speech

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Prof. Hanan M. Aly, Faculty of Economics and Political Sciences, Cairo University, for conducting the statistical methods for the study.

## Authors' contributions

MF and MN conceptualized the study. MK and AD wrote the initial and final drafts. MF and AD performed a systematic literature review and provided the theoretical basis for the study; MF, MN, DI, and MK provided clinical insights that contributed to conceptualizing the study. MN, MF, MK, and AD helped interpret the results and contributed to the discussion. MS and FW finalized the draft and prepared it for final publication. All authors read and approved the final manuscript before submission.

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## Availability of data and materials

Data and materials are available upon reasonable request.

## Declarations

### Ethics approval and consent to participate

The Ethics and Clinical Research Committee of the Psychiatry Department and the Faculty of Medicine, Cairo University, approved the study. Written informed consent was obtained from each participant. The objectives and aims of the study were clarified to the participants.

### Consent for publication

Verbal consent from the study participants was obtained for publication.

### Competing interests

The authors declare that they have no conflicts of interest.

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