

# Clinical profile of delusional disorder and its subtypes: a descriptive study from Turkey

## *Profilo clinico del disturbo delirante e dei suoi sottotipi: uno studio descrittivo dalla Turchia*

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**SUMMARY.** The fact that delusional disorder (DD) received minimal research attention indicates the need for descriptive studies that will better delineate the clinical and socio-demographic characteristics of DD. We conducted a chart review descriptive study in a tertiary hospital from Turkey. A total of 99 cases of DD were identified through hospital registry system. 57 were male (57.6%), and mean age at first admission was 49.34±13.49. The most common type of DD was persecutory (36.4%), followed by jealous type (28.3%), mixed type (18.2%), and somatic type (16.2%). Jealous type DD patients were more likely to be married, and mixed type DD patients were more likely to be divorced. The presence of hallucinations was significantly associated with history of hospitalization. About one-tenth of the patients had a family history of psychotic spectrum disorder. Comorbid depressive disorder was present in 42.9% of the patients, whereas only 9.2% had comorbid anxiety disorder. Depressive disorder comorbidity in DD seems to be associated with continued treatment for longer periods of time in psychiatry services. While most of our data were comparable with the literature on DD, our divergent findings like higher rates of male patients and jealous type of the disorder might be attributed to the cultural and geographical factors. This situation points out that future research with larger populations and from different regions would contribute to better understanding of clinical and socio-demographical characteristics of delusional disorder.

**KEY WORDS:** delusional disorder, delusions, paranoia, psychopathology.

**RIASSUNTO.** Il fatto che il disturbo delirante (DD) abbia ricevuto scarsa attenzione da parte della ricerca indica la necessità di studi descrittivi che ne delineino meglio le caratteristiche cliniche e socio-demografiche. Abbiamo condotto uno studio descrittivo in un ospedale della Turchia. Un totale di 99 casi di DD sono stati identificati attraverso il sistema di registro ospedaliero. 57 erano maschi (57,6%) e l'età media al primo ricovero era di 49,34±13,49. Il tipo più comune di DD era persecutorio (36,4%), seguito da tipo geloso (28,3%), tipo misto (18,2%) e tipo somatico (16,2%). I pazienti con DD di tipo geloso erano per lo più sposati e i pazienti con DD di tipo misto erano per lo più divorziati. La presenza di allucinazioni era significativamente associata alla storia di ospedalizzazione. Circa un decimo dei pazienti aveva una storia familiare di disturbo dello spettro psicotico. Il disturbo depressivo in comorbidità era presente nel 42,9% dei pazienti, mentre solo il 9,2% aveva un disturbo d'ansia in comorbidità. La comorbidità del disturbo depressivo nel DD sembra essere associata al trattamento continuato per periodi di tempo più lunghi nei servizi di psichiatria. Mentre la maggior parte dei nostri dati era comparabile con la letteratura sul DD, i nostri risultati divergenti come i tassi più alti di pazienti maschi e il tipo di disturbo geloso potrebbero essere attribuiti a fattori culturali e geografici. Questa situazione indica che la ricerca futura con popolazioni più numerose e provenienti da regioni diverse contribuirebbe a una migliore comprensione delle caratteristiche cliniche e socio-demografiche del disturbo.

**PAROLE CHIAVE:** disturbo delirante, deliri, paranoia, psicopatologia.

## INTRODUCTION

Delusional disorder (DD) is a psychotic disorder characterized by the presence of one or more delusions that persist for at least one month in an individual whose symptoms have never met Criterion A for schizophrenia according to the 5th Edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5)<sup>1</sup>. The DSM-5 lists different types of delusional disorder mainly based on the content of delusions, namely erotomanic, grandiose, jealous, persecutory, somatic, mixed and unspecified.

Despite being a well-established psychotic disorder, research on DD has been scarce. As an example, at the time of

this writing, a PubMed database search for the term “schizophrenia” revealed 147,874 results whereas a search for “delusional disorder” only brought 8,675 results. In addition, many studies on DD had been conducted before 1980's and DSM criteria were not used to diagnose the included patients<sup>2</sup>. Therefore, there is still a need for studies to better define clinical and demographical characteristics of patients with DD.

Although being limited in number, previous studies have established that the most frequent type of DD is persecutory. In a study of 370 patients with DD, de Portugal et al.<sup>3</sup> found that the most frequent type of DD was persecutory (48%), followed by jealous (11%), mixed (11%) and somatic types (5%).

Similarly, an earlier study found that persecutory type constituted 51% of cases with DD. In that study, mixed type was excluded and the other frequent types were determined as somatic (27.5%) and jealous (13.7%) types<sup>4</sup>. A study from North India also reported that 54.5% of patients with DD has persecutory type<sup>5</sup>. Therefore, most literature to date has shown that approximately half of patients with DD have persecutory type of the disorder. However, there are also studies that reported lower or higher rates for the persecutory type. For example, Hsiao et al.<sup>6</sup> reported that the persecutory type constituted 70.9% of their DD sample. In a study that focused on comorbidity of DD, Maina et al.<sup>7</sup> found that 40.6% of their sample had persecutory type of DD.

There are also limited reporting on the age at onset of DD. Yamada et al.<sup>4</sup> who found the mean age at onset as 41.9, also reported that females were significantly older than males at onset. Hsiao et al.<sup>6</sup> reported similar results; mean age at onset was 42.4 in their sample and women were significantly older than men at onset. A somewhat lower age at onset has been reported in two studies from India: in a large sample, Kulkarni et al.<sup>8</sup> found that the mean age at onset was 32.4 years, whereas Grover et al.<sup>5</sup> reported that the mean age at onset was 37.9 years. In another study<sup>9</sup> conducted with 61 patients in Germany, mean age at onset was 46.9. There are also a few studies in which patients with DD were compared to patients with schizophrenia. In one of those studies<sup>10</sup>, mean age at onset was 38.8 in 146 patients with DD. Mean age at first admission with delusions has also been reported in some of the aforementioned studies. For example, in the study by Yamada et al.<sup>4</sup>, the mean age at first admission was 46.8, whereas in Grover et al.'s study<sup>5</sup>, it was 41.8 years.

Although hallucinations may be seen in DD, they are not prominent and must be related to the delusional content<sup>1</sup>. Regarding the presence of hallucinations in patients with DD, Hsiao et al.<sup>6</sup> found that 11.6% of their sample reported auditory hallucinations associated with the delusional content. Tactile hallucinations were noted in 5.8% and both visual and olfactory hallucinations were noted in 2.3% of their sample. Kulkarni et al.<sup>8</sup> reported similar results: hallucinations were noted in 17.1% of their sample, with auditory hallucinations being the most common type with a rate of 10.3%. A study conducted in Spain<sup>3</sup> with a large sample also reported hallucinations in 16% of patients with DD.

In terms of comorbidity with other psychiatric diagnoses, most of the existing data on comorbidity rates come from studies that lumped patients with psychotic symptoms or different psychotic disorders together for the analyses. In a rare study of comorbidity that only included carefully selected patients with DD, Maina et al.<sup>7</sup> found that 72% of their sample had at least one additional lifetime DSM-IV psychiatric diagnosis. Affective disorders – especially major depression and dysthymia – were the most common comorbid psychiatric disorders in their sample.

The DSM-5 states that there are no major gender differences in the overall frequency of DD, with only noting that the jealous type is probably more common in males than in females. However, several studies have found erotomania to be more frequent in women. Possible gender differences in affective and substance abuse comorbidity have also been reported<sup>11</sup>.

In addition to the general scarcity of research on DD, available research mainly comes from countries located in

Northern America, Western Europe and Eastern Asia. We are not aware of any studies from Eastern Europe or Middle East regions that assessed clinical characteristics of a meticulously selected sample of DD. Apart from its unique geographical location between eastern and western countries, Turkey has a different culture and religion than countries from which the existing literature on DD came from. To summarize, much is yet to be learned on clinical and socio-demographic characteristics of the disorder as well as differential features of its subtypes. In the current study, we aim to assess the clinical and socio-demographical characteristics of patients with DD and by doing so, contribute to the scarce literature on DD to widen the scope of our current knowledge of the disorder in terms of geography, culture and religion.

## MATERIALS AND METHODS

We identified a total of 122 patients who attended to our clinic between 2009 and 2019 and were clinically diagnosed with DD on our hospital's electronic health records. In order to establish the accuracy of DD diagnoses, we used a two-step method for evaluating health records. At the first step, two reviewers assessed the diagnoses of DD independently on the basis of a checklist consisting of the DSM-5 criteria for DD (Table 1). When they both agreed upon adequacy of the DD diagnosis (i.e. the patient's records reveal that all six items of the checklist are answered as indicating the diagnosis of DD), inclusion of the patient was considered. At the second step, inclusion to the study was only accepted by reaching a consensus in an expert panel of all investigators which also includes a senior psychiatrist. In our clinic, all patients undergo a standard assessment upon their hospitalization that includes structured diagnostic interviews, symptom checklists and severity rating scales. As expected, we confirmed the diagnosis of DD in all 34 patients who have a history of hospitalization in our clinic as there were enough data available on their records collected by both non-structured and structured interviews as part of their hospitalization process. Regarding the 88 outpatients screened for inclusion to the current study, 65 of them met DD criteria according to the two-step evaluation method described above and therefore, have been included to the study. Six patients were considered as having another disorder whereas there were not enough data on the outpatient records of 17 patients to confirm the DD diagnosis. A total of 99 patients were included in the study.

Naturalistic follow-up records have also been evaluated mainly for determining the course of the patients as either chronic (continuous) or remitted. Remission was defined as a period of time after meeting criteria for DD during which no disorder-specific symptoms are present.

The data were analyzed using the Statistical Package for Social Sciences (SPSS, version 20). The normality of the data was assessed by the Kolmogorov-Smirnov test. Univariate analyses were conducted between continuous and independent variables with parametric (Student's *t*-test) or non-parametric (Mann-Whitney *U* test and Kruskal-Wallis test) tests where appropriate. Categorical variables were analyzed with the Chi-square test. The level of significance was set at  $p < 0.05$ , and all tests were two tailed. We used Bonferroni correction for post-hoc multiple comparisons.

*Clinical profile of delusional disorder and its subtypes: a descriptive study from Turkey***Table 1.** The checklist used by two assessors to confirm the DSM-5 diagnosis of delusional disorder for the study inclusion.

1. Does the patient have at least one type of delusion with a duration of 1 month or longer? (If yes, go to question 2. If no, the patient is not eligible for the study)
2. Has the patient ever met Criterion A for schizophrenia? Note: hallucinations are accepted for a diagnosis of DD only if they are not prominent and are related to the content of the delusions. (If yes, the patient is not eligible for the study. If no, go to question 3)
3. Apart from the impact of the delusions, does the patient has markedly impaired functioning or obviously bizarre or odd behavior? (If yes, the patient is not eligible for the study. If no, go to question 4)
4. If manic or major depressive episodes have occurred, were they brief relative to the duration of delusions? (If yes, go to question 5. If no, the patient is not eligible for the study)
5. Have you excluded substance/medication-induced psychotic disorder? (If yes, go to question 6. If no, the patient is not eligible for the study)
6. Is there another mental disorder that might better explain the patient's delusions? (If no, the patient is eligible to be included in the study)

**RESULTS**

42 patients were women and 57 were men (42.4 and 57.6%, respectively). Mean years of education was  $8.28 \pm 4.65$ . Married patients constituted nearly two thirds of the sample (64.6%). Most patients (69.7%) were living with their family, while 15.2% of the patients were living alone. 30.3% of the sample were retired whereas 27.3% were employed. The details of the socio-demographic characteristics of the total sample are shown in Table 2 which also includes the numbers and percentages for different DD subtypes. Mean age at first admission was  $49.34 \pm 13.49$  years. 57.3% of the patients admitted to the hospital by their own will, and delusion was the most common reason for their admissions (74.7%).

The most common type of DD was persecutory (36.4%), followed by jealous type (28.3%), mixed type (18.2%), and somatic type (16.2%). We found no patients with grandiose type and there was only one patient (1%) in the sample who had erotomanic type of DD. For the comparisons of subtypes we excluded the patient with the erotomanic type of DD and compared persecutory, jealous, somatic and mixed types.

There were no differences between the four subtypes of the disorder in terms of age at first admission, onset or course of the disorder, hospitalization, presence of hallucinations, legal problems, smoking, alcohol/substance use or comorbidity of depression or anxiety disorders. One significant finding was the association between marital status and type of DD ( $p=0.008$ ). Jealous type DD patients were more like to be married ( $p=0.002$ ), and mixed type DD patients were more like to be divorced ( $p=0.002$ ). Although we have found an association between the delusion type and suicidal ideation (a higher rate of suicidal ideation in patients with the somatic type), a Bonferroni correction revealed that this association was not statistically significant. History of suicide attempts did not also differ between the subtypes.

34 patients had a history of hospitalization (34.7%), nine patients had a history of legal problems (9.2%). 48% of the patients had a chronic course, whereas 33.7% achieved remission during the course of the disorder. 10.2% of the pa-

tients had at least one first degree relative with a history of a psychotic disorder.

42.9% of patients had comorbid depressive disorder, whereas only 9.2% had comorbid anxiety disorder. 24.5% of the patients had suicidal ideation and 8.2% had a history of attempted suicide. Hallucinations were found in 17 patients (17.2%). The presence of hallucinations was significantly associated with a history of hospitalization ( $p=0.022$ ). Another significant finding about the hallucinations was their association with anxiety disorders comorbidity ( $p=0.007$ ).

Number of outpatient visits to the hospital was significantly associated with the presence of comorbid major depression: patients with comorbid depression had a higher mean number of outpatient visits than patients without this comorbidity ( $p=0.010$ ). Comorbidity with major depression was also associated with longer follow-up periods ( $p=0.017$ ). In addition to the depression comorbidity, anxiety disorder comorbidity was also associated with mean number of hospital visits: patients with comorbid anxiety disorders had more outpatient visits than those without it ( $p=0.047$ ). However, anxiety disorder comorbidity was not associated with longer follow-up periods ( $p=0.051$ ).

We evaluated whether there are differences between the subtypes in terms of pharmacotherapy. Three patients were not taking antipsychotics (they had only one contact with our clinic) and the patient with the erotomanic type were excluded from comparisons. Therefore, we evaluated the medication regimens of 95 patients. All patients but three were using atypical antipsychotics (96.8%). The three patients who were using only typical antipsychotics had somatic type of DD. Eight other patients were using a typical antipsychotic as well as an atypical antipsychotic. Therefore, 11 patients were using a typical antipsychotic medication (11.6%). Only nine patients were using long-acting injectable antipsychotics (9.5%). Most commonly prescribed antipsychotic was risperidone ( $n=59$ , 61.1%) followed by olanzapine ( $n=28$ , 29.5%) and aripiprazole ( $n=21$ , 22.1%). Escitalopram was the most commonly used antidepressant ( $n=24$ , 25.3%). Less use of atypical antipsychotics in patients with somatic subtype was the only statistically significant difference in terms of medication regimens among different subtypes ( $p=0.002$ ).

**Table 2. Socio-demographic characteristics and delusional disorder subtypes.**

		Delusional disorder subtypes										Total	
		Persecutory		Erotomantic		Somatic		Jealous		Mixed			
		Count/ Mean	%/SD	Count/ Mean	%/SD	Count/ Mean	%/SD	Count/ Mean	%/SD	Count/ Mean	%/SD	Count/ Mean	%/SD
Gender	Women	19	52.8%	0	0.0%	6	37.5%	9	32.1%	8	44.4%	42	42.4%
	Men	17	47.2%	1	100.0%	10	62.5%	19	67.9%	10	55.6%	57	57.6%
Age at first admission		49.94	13.44	25.00	-	46.56	15.56	50.68	11.12	49.89	14.90	49.34	13.49
Education	Primary school	14	38.9%	0	0.0%	6	37.5%	10	35.7%	12	66.7%	42	42.4%
	Secondary school	1	2.8%	0	0.0%	1	6.3%	2	7.1%	2	11.1%	6	6.1%
	High school	6	16.7%	1	100.0%	3	18.8%	3	10.7%	3	16.7%	16	16.2%
	University	9	25.0%	0	0.0%	2	12.5%	7	25.0%	1	5.6%	19	19.2%
	Literate	0	0.0%	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	1.0%
	Illiterate	3	8.3%	0	0.0%	2	12.5%	0	0.0%	0	0.0%	5	5.1%
	Not enough information	3	8.3%	0	0.0%	1	6.3%	6	21.4%	0	0.0%	10	10.1%
Education year		8.61	5.27	11.00	.	7.36	4.85	9.27	4.50	7.06	3.39	8.28	4.65
Marital status	Married	20	55.6%	0	0.0%	10	62.5%	25	89.3%	9	50.0%	64	64.6%
	Divorced	5	13.9%	0	0.0%	1	6.3%	2	7.1%	7	38.9%	15	15.2%
	Widowed	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	2.0%
	Single	9	25.0%	1	100.0%	5	31.3%	1	3.6%	2	11.1%	18	18.2%
	Not enough information	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Number of children		1.71	1.83	.00	-	1.00	1.10	2.54	1.79	1.94	1.73	1.84	1.75
Living condition	Alone	10	27.8%	0	0.0%	1	6.3%	1	3.6%	3	16.7%	15	15.2%
	With parents	4	11.1%	1	100.0%	3	18.8%	2	7.1%	3	16.7%	13	13.1%
	With spouse/children	22	61.1%	0	0.0%	11	68.8%	25	89.3%	11	61.1%	69	69.7%
	Institution	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	5.6%	1	1.0%
	Other	0	0.0%	0	0.0%	1	6.3%	0	0.0%	0	0.0%	1	1.0%
	Not enough information	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Employment status	Employed	14	38.9%	0	0.0%	4	25.0%	6	21.4%	3	16.7%	27	27.3%
	Unemployed	7	19.4%	1	100.0%	5	31.3%	3	10.7%	5	27.8%	21	21.2%
	Retired as disabled	0	0.0%	0	0.0%	0	0.0%	1	3.6%	0	0.0%	1	1.0%
	Student	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	5.6%	1	1.0%
	Housewife	6	16.7%	0	0.0%	2	12.5%	6	21.4%	3	16.7%	17	17.2%
	Retired	8	22.2%	0	0.0%	5	31.3%	12	42.9%	5	27.8%	30	30.3%
	Not enough information	1	2.8%	0	0.0%	0	0.0%	0	0.0%	1	5.6%	2	2.0%

## DISCUSSION

Our study provided additional information to a scarce literature on DD. In line with the previous studies, we have found that persecutory type was the most common type of DD (36.4%). However, this percentage is somewhat lower than the ones found in most previous studies. Those studies<sup>3,5,6</sup> found that approximately half of the patients with DD have the persecutory type of the disorder.

We have found that the jealousy type was the second most common type of DD in our sample. In fact, lower than expected rate of persecutory type in our sample might be partly explained by a higher than expected rate of the jealousy type (28.3%). There are studies that reported lower rates for the jealousy type of DD. For example, de Portugal et al.<sup>3</sup> found that 11% of their sample had jealousy type of DD, whereas this rate was 8.1% in Hsiao et al.'s study<sup>6</sup> and 10.9% in Maina et al.'s study<sup>7</sup>. However, two studies from India<sup>5,8</sup> reported strikingly different results on the frequency of the jealousy type of DD. Both studies reported rates for different delusional themes instead of DSM subtypes and used the term "delusions of infidelity". Kulkarni et al.<sup>8</sup> found that delusions of infidelity was the most common delusion in their sample (44.6%). Grover et al.<sup>5</sup> found delusions of infidelity in 28.4% of their sample, which is nearly the same percentage we found in ours. Although their omission of the DSM subtypes in general, and mixed type in particular might prevent reaching a definitive conclusion, their findings suggest that India has a higher rate of jealousy type of the disorder compared to other countries where similar research on DD have been done. Similar to India, Turkey has a very different cultural and religious background than Western countries. Actually, with their patriarchal culture, Indians were shown to be more likely to express jealousy than individuals from Thailand<sup>12</sup>. Both Indian and Turkish cultures can be considered as even more patriarchal than Western cultures. Patients with the jealous type were more likely to be married than patients with other subtypes in our sample. More than two thirds (67.9%) of our 28 patients with jealousy type of DD were men, reflecting a possible role of our male dominant culture on finding higher rates of the jealousy type than some other reports.

We found no patients with the grandiose type and only one patient with the erotomanic type. This is totally in line with the similar studies in the literature<sup>3,5-7</sup>. We can conclude that grandiose and erotomanic types are the least common types of delusional disorder, at least in clinical samples.

Age at onset of DD has been most often reported to occur in between 35 and 45 years of age<sup>4,6</sup>. There are few data on age at onset differences between different subtypes of DD. In Yamada et al.'s study<sup>4</sup> on the age at onset of DD, the oldest age at onset was associated with the persecutory type, and the youngest with the somatic type. In accordance with the older age at onset compared to most psychiatric disorders, we have found that mean age at first admission was 49.3 in our sample. Considering the findings with aforementioned studies<sup>4,5</sup>, we conclude that first treatment contact for DD occurs mostly during the fifth decade of life. We found no differences between four types of DD in terms of age at first admission.

Female patients constituted only 42.4% of our sample. In his extensive review from 1982, Kendler<sup>2</sup> found a female preponderance in seven out of nine reports that provided data

on the gender distribution at first admission for DD. However, he also noted that this distribution was not as consistent and substantial as in affective disorders. In the other study<sup>3</sup> that reported findings from a large sample of DD, female/male ratio was 1.29. However, the literature on the gender distribution is not unequivocal; there are studies<sup>8</sup> that found a slightly higher number of men than women among cases with DD. Male preponderance we found might be due to our relatively small sample and our high rate of jealous type of DD. The DSM-5 stated that there are no major gender differences in the overall frequency of DD, with mentioning only the possibility of a higher prevalence of the jealous type in men<sup>1</sup>. We suggest that studies with larger samples are needed to firmly establish whether a gender difference exist in the frequency of DD. There were no significant differences between the four subtype groups of our sample in terms of gender. This is in line with most studies in the literature<sup>6,9,13</sup>.

The course of DD has been mostly investigated in comparisons between DD and schizophrenia. There are studies showing that patients with DD have a better general outcome than patients with schizophrenia. For example, Marneros et al.<sup>14</sup> showed that patients with DD showed better functionality than patients with paranoid schizophrenia. A long-term follow up study<sup>15</sup> reported that after 22 to 39 years, delusions had faded in 61% of the DD patients and 37% patients were recovered. A comparative study<sup>10</sup> found that although DD was associated with a better overall functioning than schizophrenia, it was also associated with a more chronic course. In contrast, a general population based survey from Finland<sup>16</sup> reported that the course of DD was less chronic than in undifferentiated and disorganized schizophrenia and the outcome was better in DD than in all types of schizophrenia. In a recent study using data from three independent studies, Muñoz-Negro et al.<sup>17</sup> replicated previous findings of a better global functioning among DD patients compared to patients with schizophrenia. 48% of our sample had a chronic course of DD, whereas one-third of our patients achieved remission. Our findings suggest that although DD tends to be chronic, remission can be achieved with adherence to treatment.

We found that the vast majority of the patients were using atypical antipsychotics for the treatment of DD. However, patients with the somatic type were less likely to use an atypical antipsychotic drug than patients with other types of DD. This might reflect the data on the literature<sup>18,19</sup> reporting the efficacy of typical antipsychotics – especially pimozide – for clinical entities such as monosymptomatic hypochondriacal psychosis and delusional parasitosis. Although a review published in 2016<sup>20</sup> reported a superiority of typical antipsychotics over the atypical antipsychotics for the treatment of DD; a later review by the same group<sup>21</sup> indicated that the difference between the two classes were only marginal favoring the typical antipsychotics. When thinking about the treatment of DD, one should also keep in mind that the available data is mainly based on observational studies and case series in the absence of randomized controlled trials.

Hallucinations that are related with the delusional content and not prominent were present in 17.2% of our study sample. A study with a larger sample from Spain<sup>3</sup> similarly found that 16% of the patients with DD reported hallucinations. We have found that hallucinations were associated with higher number of hospitalizations and higher anxiety disorder comorbidity. Therefore, we suggest that hallucinations in DD might have

important clinical implications and should be questioned in detail during the assessment of patients with DD.

42.9% of our sample had a depressive disorder comorbidity, mainly major depressive disorder. Presence of comorbid depression was associated with both higher number of hospital visits and longer periods of follow-up. Although our subjects' main reason for first application was delusions, comorbid depression seems to be associated with higher contact with psychiatric services in DD. In a study that analyzed mood disturbances in DD, Marino et al.<sup>22</sup> reported mood disturbances in over half (50.7%) of their sample. A study focused on comorbidity of DD found the rates of comorbid mood and anxiety disorders as 53.1 and 17.2%, respectively. Although we found slightly lower rates for both comorbid depression and anxiety compared to that study by Maina et al.<sup>7</sup>, our findings provide additional evidence that supports the notion that depressive disorders are the most common comorbid conditions in patients with DD. We found a lower than expected rate of comorbid anxiety disorders but comorbid anxiety was associated with higher number of hospital visits and the presence of hallucinations.

Our study has several limitations that needs to be acknowledged. Although our sample is relatively bigger than samples of some similar studies on DD, it might have been not big enough to detect all differences, especially the ones between different subtypes of the disorder. Retrospective chart review design is another limitation. Comorbid diagnoses were also detected through patients' health records. Record accuracy can vary widely across different interviewers and this fact may render the possibility of including biased information. However, our department has electronic health records filled by clinicians in a way that might help minimize this inevitable retrospective review bias. All patients are evaluated regarding the presence or absence of many clinical characteristics and comorbid psychiatric disorders during their initial and follow-up interviews.

## CONCLUSIONS

Patients with delusional disorder usually make their first contact with psychiatric services during the fifth decade of their lives. The most common type of the disorder is persecutory type. We found that the jealous type was the second most common type, a finding that is in line with some but not all studies. Erotomanic and grandiose types are the least common types, at least in clinical samples. There were slightly more men than women in our sample but there are other studies that reported an equal gender distribution or a female preponderance in delusional disorder. Mood disorders – especially major depressive disorder- are the most common psychiatric comorbidities and they are associated with more treatment contact.

*Conflicts of interest:* the authors have no conflict of interests to declare.

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