Contents lists available at ScienceDirect

Psychiatry Research

Original Article

Latency to treatment seeking in patients with obsessive-compulsive disorder: Results from a large multicenter clinical sample

Daniel Lucas da Conceição Costa [a,b,*], Adriano Polpo de Campos [c], Carlos Alberto de Bragança Pereira [d,e], Albina R. Torres [b,f], Allan Christiano dos Santos [a], Guaraci Requena [e,g], Ygor Arzeno Ferrão [b,h], Maria Conceição do Rosário [b,i], Eurípedes Constantino Miguel [a,b], Helen Blair Simpson [j], Roseli Gedanke Shavitt [a,b], Juliana Belo Diniz [a,b]

[a] Institute of Psychiatry, Hospital das Clinicas HCFMUSP, Faculdade de Medicina, Universidade de Sao Paulo, Sao Paulo, Brazil
[b] Brazilian Research Consortium on Obsessive-Compulsive Spectrum Disorders (CTOC), Brazil
[c] Department of Statistics, The University of Western Australia, Perth, Australia
[d] Institute of Applied Mathematics (INMA), Federal University of Mato Grosso do Sul (UFMS), Campo Grande, Mato Grosso do Sul, Brazil
[e] Institute of Mathematics and Statistics, University of Sao Paulo, Sao Paulo, Brazil
[f] Deparment of Neurology, Psychology and Psychiatry, Botucatu Medical School, São Paulo State University (UNESP), Botucatu, SP, Brazil
[g] Institute of Exact Sciences, Federal University of Viçosa, Florestal, Minas Gerais, Brazil
[h] Clinical Medical Department, Federal University of Health Sciences of Porto Alegre, Brazil
[i] Child and Adolescent Psychiatry Unit (UPIA), Department of Psychiatry, Federal University of São Paulo, São Paulo, Brazil
[j] Department of Psychiatry, Columbia University and New York State Psychiatric Institute, New York, NY, USA

ARTICLE INFO

ABSTRACT

This study aimed to identify the factors associated with a delay in treatment-seeking among patients with obsessive-compulsive disorder (OCD), a disabling neuropsychiatric disorder. To achieve this purpose, we conducted a cross-sectional study examining latency to treatment (LTT) and its associated correlates in 863 patients with OCD. We defined LTT as the time lag between the awareness of discomfort and/or impairment caused by symptoms and the beginning of OCD-specific treatment. To determine the socio-demographic and clinical characteristics associated with LTT, we built an interval-censored survival model to simultaneously assess the relationship between all variables, representing the best fit to our data format. The results of our study showed that approximately one-third of OCD patients sought treatment within two years of symptom awareness, one-third between two and nine years, and one-third after ten or more years. Median LTT was 4.0 years (mean = 7.96, SD = 9.54). Longer LTT was associated with older age, early onset of OCD symptoms, presence of contamination/cleaning symptoms and full-time employment. Shorter LTT was associated with the presence of aggression symptoms and comorbidity with hypochondriasis. The results of our study confirm the understanding that LTT in OCD is influenced by several interdependent variables – some of which are modifiable. Strategies for reducing LTT should focus on older patients, who work in a full-time job, and on individuals with early onset of OCD and contamination/cleaning symptoms.

1. Introduction

Obsessive-compulsive disorder (OCD) is a relatively common and disabling neuropsychiatric disorder, characterized by the presence of obsessions (repetitive, unwanted, and distressful thoughts, ideas, or images) and compulsions (repetitive behaviors or mental rituals aimed at reducing distress provoked by obsessions) (Stein et al., 2019; Diagnostic and Statistical Manual of Mental Disorders 2000). The lifetime prevalence of OCD in adults ranges from 1.5 to 3%(1). Because OCD can severely impair quality of life for both patients and caregivers (Rosa et al., 2012; Velloso et al., 2018; Ramos-Cerqueira et al., 2008), OCD is considered a severe mental health disorder whose public health significance has been underestimated (Torres et al., 2006). The burden imposed by OCD-related symptomatology can be minimized by evidence-based treatments – specifically, selective serotonin reuptake inhibitors (SSRIs) and cognitive-behavior therapy (CBT) are considered

* Corresponding author.

first-line treatments for OCD (Stein et al., 2019).

Despite the availability of effective treatments for OCD, the latency to seek treatment is often delayed, and in some cases, treatment-seeking never occurs (García-Soriano et al., 2014). According to epidemiological studies, up to 60% of subjects who meet OCD diagnostic criteria do not receive psychiatric or psychological treatment, even in WEIRD (western, educated, industrialized, rich, and democratic) countries (Ruscio et al., 2010; Torres et al., 2007; Kohn et al., 2004).

Help-seeking behavior may be related to socio-demographic and clinical characteristics, mental health awareness, and/or treatment accessibility (García-Soriano et al., 2014). To investigate these factors, epidemiological and clinical studies have been conducted (Ruscio et al., 2010; Torres et al., 2007; Pinto et al., 2006; Belloch et al., 2009; Dell'Osso et al., 2010; Demet et al., 2010; Stengler et al., 2013; Subramaniam et al., 2012; Mayerovitch et al., 2003; Goodwin et al., 2002; Issakidis and Andrews, 2003; Mcleod and Shanahan, 1996) Although numerous studies examining treatment-seeking behavior among OCD patients exist, most were conducted in relatively small clinical samples and did not take the interdependence of associated variables into account. For example, mental health literacy, treatment accessibility, and clinical trajectory are known to be highly correlated (Mcleod and Shanahan, 1996).

The Brazilian Research Consortium on Obsessive-Compulsive Spectrum Disorders (CTOC) comprises a sample of 1001 outpatients – including demographic information and clinical data collected by experienced mental health professionals using a wide range of structured and validated instruments (Miguel et al., 2008). Therefore, this database represents a relevant sample for further investigating the correlates of latency to treatment (LTT) in patients with OCD.

In this study, we aimed to estimate the LTT and to assess its demographic and clinical correlates among well-characterized OCD patients who have sought treatment at some point along the course of their illness. Following the convention utilized by prior studies (Demet et al., 2010; Stengler et al., 2013; Dell'Osso et al., 2015; Benatti et al., 2016), we recorded **OCD onset** as the earliest age that patients recognized any *interference or functional impairment* caused by OCD symptoms (i.e., rather than simply the earliest age of symptom presence) as our starting point in relation to treatment seeking. Based on a review including 12 studies examining this topic, we hypothesized that shorter LTT would be associated with greater OCD severity, better insight, specific dimensions of OCD symptoms and the presence of psychiatric comorbidity (García-Soriano et al., 2014). To properly address the complexity of interdependence between the factors associated with treatment seeking behavior, we used a statistical model built to accommodate the limitations inherent to the cross-sectional design of this study.

2. Methods

2.1. Overview

The CTOC database comprises data from eight outpatient clinics located in six cities within three different Brazilian regions collected from 2003 to 2009 (Fig. 1). The CTOC methods have been described in detail elsewhere (Miguel et al., 2008). The investigation was carried out in accordance with the latest version of the Declaration of Helsinki and was approved by the research ethics committees of all involved institutions. All participants or their legal representatives, in the case of children and adolescents, provided written informed consent.

2.2. Participants

Patients were eligible if they had DSM-IV-OCD as their main psychiatric diagnosis and were willing to participate in the research. The sample included information on 1001 patients with OCD (955 adults and 46 children/adolescents). Information used to construct the outcome variable was unavailable for 138 (13.8%) out of the 1001 participants. Therefore, our final sample comprised 863 subjects (33 children/adolescents and 830 adults).

2.3. Assessments

Experienced clinical psychologists or psychiatrists conducted the face-to-face interviews. Socio-demographic features and medical history were obtained, and patients underwent structured psychiatric evaluation using validated instruments, including the Structured Clinical Interview for DSM-IV Axis-I Disorders (SCID-I) (Denys et al., 2007); the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) (WK Goodman et al., 1989; WK Goodman et al., 1989); the Dimensional Yale-Brown
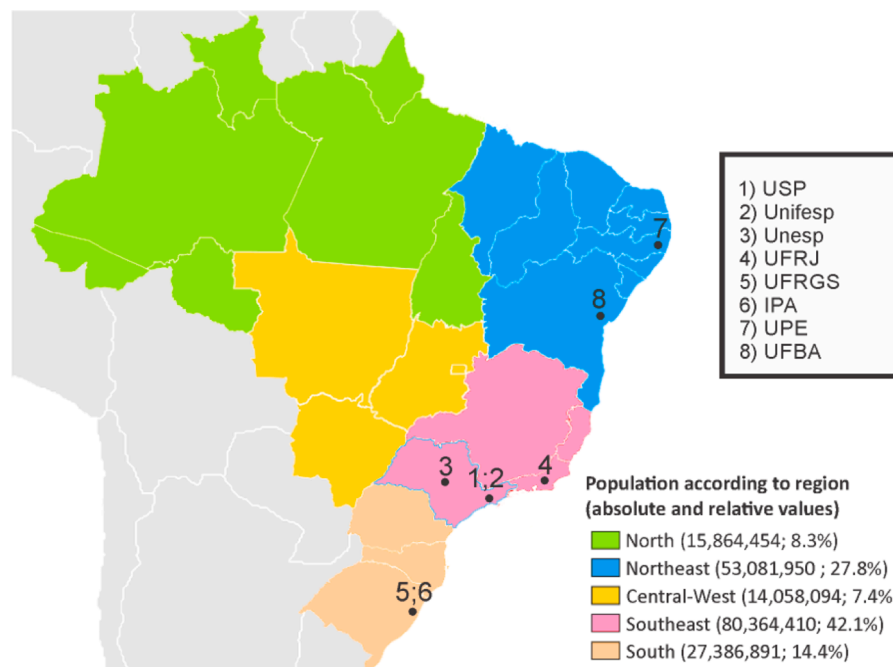

Fig. 1. C-TOC centers were located in the southeast (*n* = 4), south (*n* = 2) and northeast (*n* = 2) regions of Brazil.

Obsessive-Compulsive Scale (DY-BOCS) (Rosario-Campos et al., 2006); and the Brown Assessment of Beliefs Scale (BABS) (Eisen et al., 1998). The DY-BOCS classifies OCD symptoms according to six dimensions: aggression, sexual/religious, contamination/cleaning, symmetry/ordering/repeating/counting, hoarding, and miscellaneous. Interviewers recorded the age of onset for each specific symptom mentioned in the DYBOCS.

2.4. Operational definition of age of OCD onset

To determine the **age of OCD symptom onset**, we used the youngest age reported in the DY-BOCS for any of the endorsed symptoms. Regarding the age in which OCD symptoms started interfering with the individual's functioning, we asked: "*When did your obsessions and compulsions really start to bother you and to interfere with your ability to live normally?*". We named this variable as **OCD onset**, since interference and/or distress are necessary to determine any psychiatric diagnosis, rather than the mere presence of symptoms. Regarding the age of OCD treatment initiation, we asked: "*When did you first seek treatment for your obsessions and compulsions?*" All treatment modalities were considered, even if they were not fully evidence-based (e.g., any pharmacological or psychological interventions sought specifically to treat OCD).

2.5. Definition of latency to treatment (LTT)

The outcome variable was constructed subtracting the age of OCD onset from the age of OCD treatment initiation. As Brazil has a public and universal-access health system, most patients included in our sample received some form of treatment for their psychiatric illness shortly after seeking help. In this way, LTT was equivalent to the duration of untreated illness (DUI). However, we should note that the treatments provided were aimed at reducing the burden of OCD symptoms, but did not necessarily follow international guidelines for the treatment of OCD. This is similar in other countries (Brakoulias et al., 2016; Isomura et al., 2016).

2.6. Statistical analysis

Latency to treatment is likely a complex outcome – influenced by several interdependent variables. The statistical model was chosen to fit the following data characteristics: the fact that the study subjects consisted of a convenience sample originating from eight heterogeneous centers and that latency to treatment was computed in one-year intervals (i.e., all patients who sought treatment between 0 and 12 months after OCD-related discomfort onset were classified as having had the same latency to treatment – up to one year).

Variables were entered in the model if they met the following criteria: plausibility according to previous studies and absence of collinearity with other variables. When variables were highly collinear with each other, only one of them was included (e.g., the severity of obsessions and compulsions as measured by the YBOCS was collinear with the total score and thus we included only the YBOCS total score). In addition, specific comorbidities with low prevalence were regrouped under broader categories (e.g., all impulse control disorders assessed with the SCID I/P were classified as one category of impulse control disorders).

To analyze the data, we used a semi-parametric Bayesian survival model with a log-linear median (Lin et al., 2012). Advantages of the model include: 1) the underlying distribution of LTT was estimated by a non-parametric part; 2) the analysis took all variables into account at the same time; 3) the relationship between the median LTT and other variables in the study was log-linear, similar to what is expected in our survival model; 4) the model allows for the consideration of the interval-censored response; and 5) the model is not significantly distorted by the effects of outliers (Lin et al., 2016). Detailed information about how the model was built can be found in the **Supplemental**

Material.

In order to test this model, built to address the complex interaction between multiple variables, we built two hypothetical examples based on the available literature concerning long-term outcomes in OCD. The complete description of the classifications used for **example 1** (best-case scenario) and **example 2** (worst-case scenario) can be found in the **Supplemental Material**. The results of these hypothetical classifiers are shown as graphical representations, in which the distance between the reference and the classifier can be visualized.

The level of statistical significance was set at p-value <0.05.

3. Results

The sample included more women than men (57.7% female) and more participants were single than non-single (54.7% single). Most were Caucasians (82.2%) and less than half of participants were working (43.2%) at the time of the assessment. The mean age was 35.0 years (SD = 12.9; median = 33.0). More than one third (39.1%) of the sample had early onset OCD (i.e., OCD symptoms emerged before 10 years of age). Regarding clinical characteristics, most of the individuals (89.5%) had at least one additional psychiatric diagnosis. The mean YBOCS total score was 25.8 (SD = 7.3) and the proportion of patients with poor or absent insight, according to the Brown Assessment of Beliefs Scale, was 15.1%.

As can be seen in Fig. 2, roughly one-third of OCD patients took up to 2 years to initiate treatment for OCD, after becoming distressed or impaired by their OCD symptoms. Another one-third took between two and nine years to seek treatment, and one-third took ten or more years. Median LTT was 4.0 years (mean = 7.96, SD = 9.54).

Table 1 summarizes the results of the analyses. The following characteristics were significantly associated with latency to treatment:

Age at the time of study assessment: the reference was set as being 18 years of age. Age older than 18 at the time of the assessment was associated with a longer LTT (p-value<0.001). The median LTT increased 4.4% for each year (MR = 1.044) higher than 18. For example, it is expected that a person age 28 years will have a median latency to treatment 54.8% higher than a person of age 18;

Age at OCD symptom onset: the reference was set at age 3 as a hypothetical age of onset of OCD symptoms. The median LTT decreased 5% for each year higher than 3, that is, the higher the age of OCD symptoms onset, the shorter the LTT (MR = 0.95, p-value< 0.001). This result can also be read in the opposite direction, i.e., the lower the age of OCD symptoms onset, the higher the LTT;

Employment status: The reference was set as being currently employed in a full-time job. OCD individuals who were working under free-lance conditions had a 45.6% lower median LTT than those employed in a full-time job (MR = 0.544, p-value = 0.033);

Presence of comorbid lifetime hypochondriasis: the reference was set as absence of a hypochondriasis diagnosis. When present, hypochondriasis predicted a shorter LTT (MR = 0.492, p-value = 0.011);

Absence of symptoms on the contamination/cleaning dimension: the reference was set as the presence of symptoms of this dimension. Absence of symptoms of the contamination/cleaning dimension was associated with shorter LTT (MR = 0.687, p-value = 0.012);

Presence of symptoms on the aggression dimension: the reference was set at the absence of symptoms of this dimension. Presence of symptoms of the aggression dimension predicted a shorter LTT (MR = 0.744, p-value = 0.039);

Center of origin: the reference was set at the Universidade de Sao Paulo (USP) center, the center that contributed the largest sample (n = 404) to this study. A second center in Sao Paulo, Universidade Federal de Sao Paulo (UNIFESP), was associated with shorter LTT (MR = 0.684, p-value = 0.052).

As depicted in Fig. 3, the line for the reference confirms that LTT behaves as a log-linear distribution.

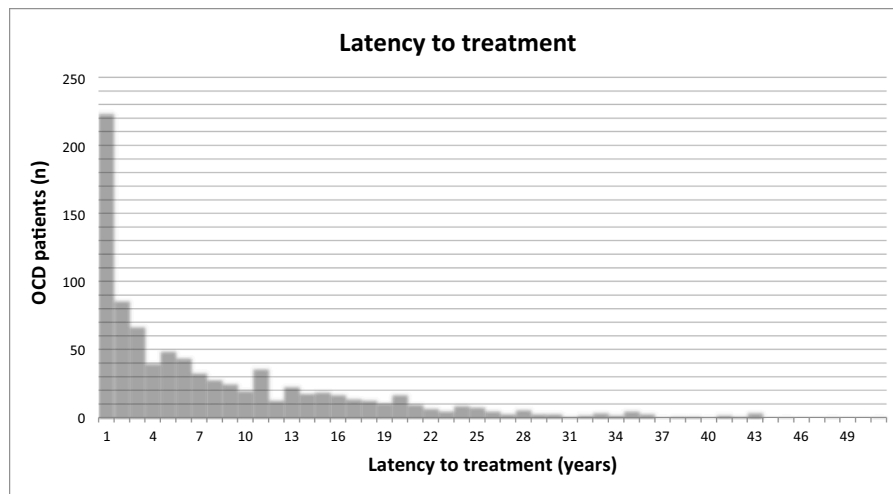When multiple variables of poor long-term outcome were combined

Fig. 2. The distribution of latency to treatment resembles an exponential curve. In other words, it follows a non-normal distribution. Therefore, median rather than mean was the most suitable central tendency measure to describe the outcome variable.

in our hypothetical example 2 (worst-case scenario), an increase in LTT was observed. While example 1 was associated with a very short LTT, example 2 was associated with a delay that could reach many years. The estimated LTT in the hypothetical reference case was 5.6 years, 0.9 years in the best-case scenario case, and 480.6 years in the worst-case scenario case. The latter can be understood as no search for treatment for OCD in a lifetime.

4. Discussion

To the best of our knowledge, this is the largest study to date in which LTT (or the duration of untreated illness) and several socio-demographic and clinical correlates were investigated in a sample of patients with OCD that had been admitted to specialized outpatient clinics at some point during their treatment trajectory. It is also the first study to adopt a statistical model built for the consideration of several types of interdependence between variables – and to choose those most likely to influence LTT while accounting for the effects of all other variables in the model. The distribution of LTT in our sample resembled a log-linear distribution rather than a normal distribution. Previous studies using statistical models that assumed a normal distribution of the outcome variable may have produced misleading results.

Results of the present study indicated that the median LTT was 4.0 years (mean = 7.96, SD = 9.54). Moreover, older patients at the time of the assessment, those with early onset of OCD symptoms and symptoms of the contamination/cleaning dimension had a longer LTT. On the other hand, those who were working under a free-lance condition, who had symptoms of the aggressive dimension or comorbid hypochondriasis, had a shorter LTT.

In the next paragraphs, we will discuss possible explanations for the significant associations observed between different socio-demographic and clinical features and LTT in patients with OCD.

First, the association between older age at the time of the assessment and longer LTT may be explained by the low availability of effective and evidence-based pharmacological treatments for OCD before 1990. In our sample, more than one-third of the participants had an onset of OCD before 1990. Clinical trials demonstrating the efficacy of clomipramine in mitigating the severity of OCD were conducted in the early 80′s, whereas those demonstrating the efficacy of SSRIs were conducted in the 90′s (Koran et al., 2007; Soomro et al., 2008; Bandelow et al., 2012). Therefore, there were few effective treatments for OCD available to patients who were born before 1990. In addition, awareness of psychiatric conditions, including OCD, has been growing over time, contributing to a reduction in the stigma associated with mental health

disorders, and thus facilitating treatment-seeking behavior. Second, the association between lower age at OCD onset and longer LTT may be related to the difficulties associated with the proper assessment of psychopathology in children. Many children do not view their OCD symptoms as foreign and unwelcome compared to the typical adult. Indeed, it has been estimated that 20% to 45% of youth with OCD exhibit poor or absent insight (Selles et al., 2018). Moreover, the relationship between obsessions and compulsions is sometimes less clear in youth than in adults, as the former may not be able to understand the intended purpose of compulsive behaviors or thoughts (Diagnostic and Statistical Manual of Mental Disorders 2000). In addition, this association may be influenced by the fact that treatment seeking behavior of children and adolescents relies on parents' or caregivers' attitudes. Third, individuals with OCD who were employed in a full-time job had a higher LTT than those who worked in a free-lance employment regimen. This finding is consistent with the results of a previous study (Goodwin et al., 2002), which demonstrated that full-time employment decreased the likelihood of being ready to seek help. Fourth, we found a significant association between the presence of contamination cleaning symptoms and longer LTT. Although contamination/cleaning symptoms constitute the most common and "classic" OCD symptoms (and maybe the most easily recognizable manifestation of OCD by the general population), in the present study their presence predicted a longer LTT. Perhaps these symptoms are more tolerable when less severe, as they would lie on the border of what might be considered pathological. In other words, less severe contamination/cleaning symptoms may be regarded as extreme, but not necessarily an evidence of the presence of a psychiatric illness that would require treatment. Another important aspect of these symptoms is the high level of family accommodation (FA) associated with them. Although FA is a common phenomenon in OCD, it is particularly common when the patient presents with contamination/cleaning symptoms (Albert et al., 2010; Flessner et al., 2011; Lebowitz et al., 2012). Therefore, it is plausible that FA may be a factor that moderates the postponement of treatment seeking for patients with contamination/cleaning symptoms.

On the other hand, the presence of aggression OCD symptoms and comorbid hypochondriasis were significantly associated with shorter LTT. It is interesting to note that aggressive obsessions include thoughts that might evoke more shame in comparison to other obsessions. Thus, these thoughts may be more easily perceived as ego-dystonic by individuals with this specific OCD symptom – who may then perceive themselves as dangerous or sinners, producing feelings of fear and humiliation. Clinically, these obsessions are more disturbing and more anxiety provoking (Beşiroğlu and Ağargün, 2006). Also, they are

Table 1

Socio-demographic and clinical correlates of latency to treatment in patients with OCD.

	Parameter (SD)	MR (SD)	95% CI	p-value
Sex (Reference category: female)				
Male	-0.048 (0.109)	0.959 (0.104)	(0.772; 1.167)	0.561
Age, years (Reference value: 18)				
	0.044 (0.005)	1.045 (0.005)	(1.034; 1.055)	**<0.001**
Age at OCD symptoms onset, years (Reference value: 3)				
	-0.051 (0.009)	0.950 (0.008)	(0.934; 0.966)	**<0.001**
Marital status (Reference category: single)				
Cohabiting	-0.156 (0.357)	0.910 (0.326)	(0.416; 1.648)	0.464
Widow	-0.030 (0.351)	1.030 (0.356)	(0.461; 1.861)	0.721
Married	0.075 (0.117)	1.085 (0.126)	(0.859; 1.339)	0.557
Divorced	0.103 (0.177)	1.125 (0.200)	(0.784; 1.550)	0.602
Ethnicity (reference category: caucasian)				
Other	-0.996 (1.043)	0.595 (0.601)	(0.044; 2.332)	0.171
Black	-0.315 (0.270)	0.755 (0.198)	(0.415; 1.215)	0.167
Mixed	0.132 (0.164)	1.156 (0.190)	(0.821; 1.564)	0.540
Asian	0.489 (0.348)	1.728 (0.591)	(0.791; 3.128)	0.284
Employment status (Reference category: working full-time)				
Other	-0.696 (0.432)	0.544 (0.224)	(0.194; 1.027)	**0.033**
Unemployed	-0.192 (0.145)	0.834 (0.121)	(0.610; 1.087)	0.143
Retired or disabled	-0.189 (0.150)	0.837 (0.126)	(0.613; 1.100)	0.167
Student	-0.296 (0.194)	0.758 (0.146)	(0.503; 1.080)	0.083
Homemaker	-0.102 (0.158)	0.914 (0.145)	(0.663; 1.221)	0.407
Social class [Reference category: A (higher)]				
B	0.029 (0.167)	1.044 (0.178)	(0.751; 1.450)	0.963
C	0.173 (0.171)	1.206 (0.211)	(0.869; 1.710)	0.422
D	0.106 (0.249)	1.147 (0.287)	(0.677; 1.837)	0.738
E (lower)	0.210 (0.331)	1.301 (0.421)	(0.611; 2.218)	0.745
Center of origin (Reference category: USP)				
UNIFESP	-0.409 (0.247)	0.684 (0.168)	(0.400; 1.068)	0.052
IPA	-0.492 (0.547)	0.703 (0.367)	(0.196; 1.520)	0.229
UNESP	-0.095 (0.263)	0.941 (0.244)	(0.535; 1.478)	0.641
UPE	-0.063 (0.180)	0.954 (0.172)	(0.652; 1.336)	0.642
UFRGS	-0.053 (0.140)	0.958 (0.134)	(0.716; 1.244)	0.683
UFBA	0.040 (0.236)	1.070 (0.250)	(0.625; 1.623)	0.983
UFRJ	0.095 (0.225)	1.128 (0.253)	(0.714; 1.688)	0.890
OCD without comorbidity (Reference category: no)				
Yes	-0.086 (0.195)	0.935 (0.184)	(0.633; 1.355)	0.563

Table 1 (*continued*)

	Parameter (SD)	MR (SD)	95% CI	p-value
Comorbid major depression (Reference category: Present)				
Absent	-0.078 (0.117)	0.932 (0.110)	(0.741; 1.182)	0.388
Comorbid dysthymia (Reference category: Present)				
Absent	0.120 (0.162)	1.142 (0.187)	(0.830; 1.563)	0.599
Comorbid bipolar disorder (Reference category: Present)				
Absent	0.046 (0.187)	1.065 (0.196)	(0.708; 1.466)	0.829
Comorbid anxiety disorder (Reference category: Present)				
Absent	-0.080 (0.134)	0.932 (0.126)	(0.711; 1.198)	0.466
Comorbid PTSD (Reference category: Present)				
Absent	0.265 (0.134)	1.315 (0.178)	(0.991; 1.694)	0.064
Comorbid hypochondriasis (Reference category: Present)				
Absent	-0.782 (0.398)	0.492 (0.179)	(0.190; 0.866)	**0.011**
Comorbid substance use disorder (Reference category: Present)				
Absent	0.049 (0.174)	1.066 (0.184)	(0.753; 1.478)	0.901
Comorbid OCD-related disorder (Reference category: Present)				
Absent	0.103 (0.110)	1.115 (0.123)	(0.890; 1.381)	0.427
Comorbid eating disorder (Reference category: Present)				
Absent	0.292 (0.162)	1.357 (0.222)	(0.987; 1.869)	0.114
Comorbid impulse control disorder (Reference category: Present)				
Absent	0.010 (0.118)	1.017 (0.121)	(0.797; 1.264)	0.949
Number of comorbid disorders significantly associated with LTT (Reference value: 0)				
	0.026 (0.076)	1.029 (0.078)	(0.877; 1.203)	0.759
OCD Severity, indicated by the Y-BOCS total score (Reference value: 16)				
	0.003 (0.010)	1.003 (0.010)	(0.983; 1.023)	0.682
Level of insight, indicated by the BABS score (Reference value: 0)				
	0.013 (0.009)	1.013 (0.009)	(0.994; 1.031)	0.158
Presence of symptom dimension according to the DY-BOCS				
Contamination/cleaning (Reference category: Absent)				
Present	-0.388 (0.161)	0.687 (0.112)	(0.496; 0.934)	**0.012**
Aggression (Reference category: Present)				
Absent	-0.310 (0.168)	0.744 (0.125)	(0.525; 1.010)	**0.039**
Miscellanea (Reference category: Present)				
Absent	-0.171 (0.193)	0.859 (0.167)	(0.574; 1.230)	0.285
Ordering/symmetry/counting (Reference category: Present)				
Absent	-0.104 (0.224)	0.924 (0.209)	(0.576; 1.401)	0.521
Sexual-religious (Reference category: Present)				

Table 1 (*continued*)

	Parameter (SD)	MR (SD)	95% CI	p-value
Absent	-0.053 (0.163)	0.961 (0.156)	(0.684; 1.296)	0.684
Hoarding (Reference category: Present)				
Absent	0.191 (0.145)	1.223 (0.177)	(0.906; 1.586)	0.231
Severity of symptom dimension, according to the DY-BOCS scores				
Contamination/cleaning (Reference value: 1)				
	-0.022 (0.014)	0.978 (0.014)	(0.950; 1.006)	0.120
Sexual-religious (Reference value: 1)				
	-0.001 (0.017)	0.999 (0.017)	(0.967; 1.032)	0.967
Aggression (Reference value: 1)				
	0.001 (0.016)	1.001 (0.016)	(0.968; 1.035)	0.891
Hoarding (Reference value: 1)				
	0.005 (0.017)	1.005 (0.017)	(0.973; 1.038)	0.872
Ordering/symmetry/ counting (Reference value: 1)				
	0.017 (0.016)	1.018 (0.016)	(0.987; 1.051)	0.257
Miscellanea (Reference value: 1)				
	0.020 (0.016)	1.020 (0.016)	(0.991; 1.052)	0.207
Global (Reference value: 4)				
	-0.005 (0.014)	0.995 (0.014)	(0.969; 1.025)	0.585

Abbreviations: SD= standard deviation; MR= median ratio; CI= credibility interval; USP= University of Sao Paulo; UNIFESP= Federal University of Sao Paulo; IPA= Methodist University Center; UNESP= Sao Paulo State University; UPE= University of Pernambuco; UFRGS= Federal University of Rio Grande do Sul; UFBA= Federal University of Bahia; UFRJ= Federal University of Rio de Janeiro; OCD= obsessive-compulsive disorder; PTSD= post-traumatic stress disorder; Y-BOCS= Yale-Brown Obsessive-Compulsive Scale; BABS= Brown Assessment of Beliefs Scale; DY-BOCS= Dimensional Y-BOCS.

associated with a range of avoidant behaviors that can have a significantly interfere with daily life. Together these factors may direct the patient to seek professional help in a shorter period of time (Mayerovitch et al., 2003; Robinson et al., 2017). Likewise, the comorbidity with hypochondriasis, currently classified as an anxiety disorder in the DSM-5, was independently associated with shorter LTT. Hypochondriasis is characterized by the persistent belief in the presence of a serious physical illness resulting from the misinterpretation of physical symptom(s), even though repeated investigations and examinations have identified no adequate physical explanation (van den Heuvel et al., 2014). It is possible to speculate that one of these frequent medical consultations may have resulted in referral for psychiatric treatment.

The hypothetical cases based on prognosis illustrated that when multiple factors are taken into consideration, they act synergistically to improve or to worsen the outcome. Longer LTT can contribute, in a worst-case scenario, to further difficulties regarding disease and functional recovery. Recent studies (Albert et al., 2019; Fineberg et al., 2019) have demonstrated that an extended DUI has a negative impact on clinical outcomes, including reduced treatment response rates. An expert consensus based on clinical, epidemiological, health economic, and brain imaging studies (Gelman et al., 2003) showed that early interventions for OCD are essential, since treatment delay may have a 'toxic' effect, prolonging unnecessary suffering and disability. Therefore, identifying correlates of treatment delay in patients with OCD may contribute to secondary prevention and to improved treatment response.

The present findings should be interpreted considering two limitations. First, LTT was defined according to variables subject to recall bias (age of onset of OCD symptoms and OCD-related interference). Longitudinal designs would be the ideal, although they are costly and burdensome. Second, levels of development, income and healthcare system organization specific to Brazil preclude the direct generalization of the present findings to countries with more diversity in these social and cultural variables. On the other hand, most studies addressing treatment seeking patterns in subjects with OCD were conducted in high-income countries, whereas our findings represent the trajectory of subjects from a developing country – regarding their first treatment for OCD after facing many challenges related to the availability of mental health services. Therefore, the correlates of LTT demonstrated in our study are more likely to be found in countries with similar levels of health literacy and treatment availability.

Our findings provide an important contribution to the literature on treatment seeking in OCD. Previous studies failed to describe the log-linear distribution of treatment seeking, which may have led researchers to overestimate the treatment seeking delay. In addition, the present results confirm the complex associations that exist between variables that greatly influence LTT. Our results may assist policy makers to plan actions aimed at shortening LTT, such as increasing the availability of mental health services specialized in OCD and promoting the awareness of OCD among the general population through mental health education. These measures may be proved meaningful as previous studies have demonstrated that the largest part of the duration of illness in patients with OCD was represented by the DUI, meaning that patients had spent most of their illness without receiving any pharmacological treatment (Dell'Osso et al., 2019). It is our hope that the present study provides for a deeper understanding of the factors that facilitate and hinder treatment seeking in OCD.

CRediT authorship contribution statement

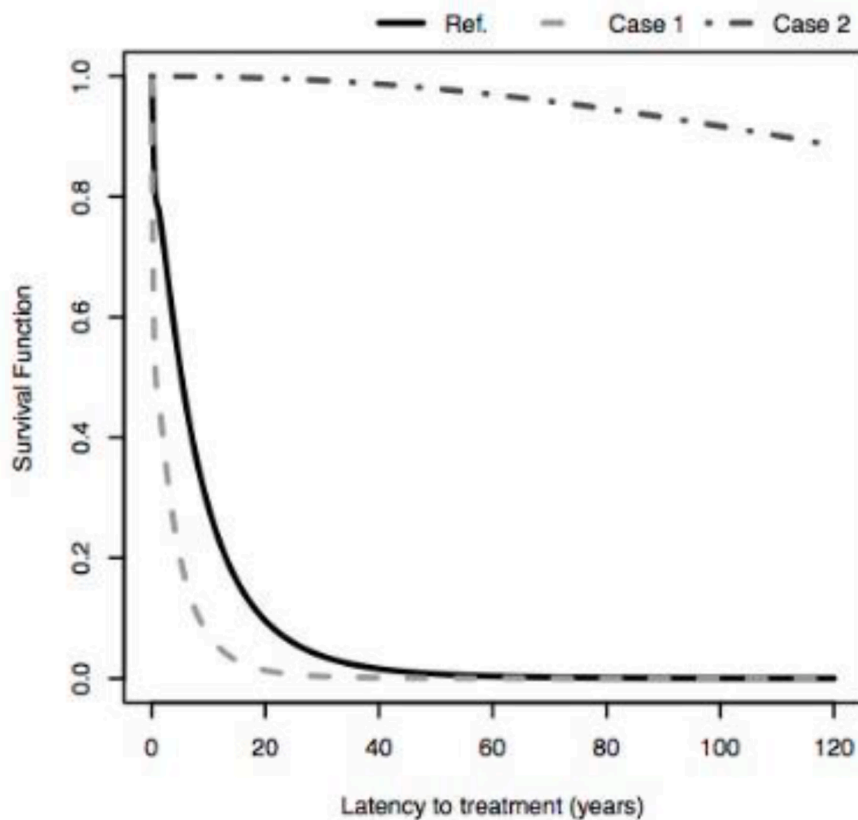**Declaration of Competing Interest**

Fig. 3. Case 1 refers to the best-case scenario and case 2 to the worst-case scenario. When multiple variables associated with delayed help seeking were combined, our model showed that latency to treatment reached an extremely high level, making it impossible. Differently, when variables associated with early help seeking were combined, latency to treatment became much lower. The reference line confirms the exponential distribution of latency to treatment even when all the variables are considered in the model. Fig. 3. Graphical representations of latency to treatment in two different scenarios regarding specific socio-demographic and clinical characteristics of patients with OCD.

Abbreviation: Ref= reference case

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2022.114567.

References

Albert, U., Bogetto, F., Maina, G., Saracco, P., Brunatto, C., Mataix-Cols, D., 2010. Family accommodation in obsessive-compulsive disorder: relation to symptom dimensions, clinical and family characteristics. Psychiatry Res. 179 (2), 204–211.

Albert, U., Barbaro, F., Bramante, S., Rosso, G., De Ronchi, D., Maina, G., 2019. Duration of untreated illness and response to SRI treatment in obsessive-compulsive disorder. Eur. Psychiatry 58, 19–26.

Bandelow, B., Sher, L., Bunevicius, R., Hollander, E., Kasper, S., Zohar, J., et al., 2012. Guidelines for the pharmacological treatment of anxiety disorders, obsessive-compulsive disorder and posttraumatic stress disorder in primary care. Int. J. Psychiatry Clin. Pract. 16 (2), 77–84.

Beşiroğlu, L., Ağargün, M.Y., 2006. [The correlates of healthcare seeking behavior in obsessive-compulsive disorder: a multidimensional approach]. Turk. Psikiyatri Derg. 17 (3), 213–222.

Belloch, A., Del Valle, G., Morillo, C., Carrió, C., Cabedo, E, 2009. To seek advice or not to seek advice about the problem: the help-seeking dilemma for obsessive-compulsive disorder. Soc. Psychiatry Psychiatr. Epidemiol. 44 (4), 257–264.

Benatti, B., Camuri, G., Dell'Osso, B., Cremaschi, L., Sembira, E., Palazzo, C., et al., 2016. Which factors influence onset and latency to treatment in generalized anxiety disorder, panic disorder, and obsessive-compulsive disorder? Int. Clin. Psychopharmacol. 31 (6), 347–352.

Brakoulias, V., Starcevic, V., Belloch, A., Dell'Osso, L., Ferrão, Y.A., Fontenelle, L.F., et al., 2016. International prescribing practices in obsessive-compulsive disorder (OCD). Hum. Psychopharmacol. 31 (4), 319–324.

Dell'Osso, B., Buoli, M., Hollander, E., Altamura, A.C., 2010. Duration of untreated illness as a predictor of treatment response and remission in obsessive-compulsive disorder. World J. Biol. Psychiatry 11 (1), 59–65.

Dell'Osso, B., Benatti, B., Oldani, L., Spagnolin, G., Altamura, A.C., 2015. Differences in duration of untreated illness, duration, and severity of illness among clinical phenotypes of obsessive-compulsive disorder. CNS Spectr. 20 (5), 474–478.

Dell'Osso, B., Benatti, B., Grancini, B., Vismara, M., De Carlo, V., Cirnigliaro, G., et al., 2019. Investigating duration of illness and duration of untreated illness in obsessive compulsive disorder reveals patients remain at length pharmacologically untreated. Int. J. Psychiatry Clin. Pract. 23 (4), 311–313.

Demet, M.M., Deveci, A., Taşkin, E.O., Erbay Dündar, P., Türel Ermertcan, A., Mizrak Demet, S., et al., 2010. Risk factors for delaying treatment seeking in obsessive-compulsive disorder. Compr. Psychiatry 51 (5), 480–485.

Denys, D., Fineberg, N., Carey, P.D., Stein, D.J., 2007. Quetiapine addition in obsessive-compulsive disorder: is treatment outcome affected by type and dose of serotonin reuptake inhibitors? Biol. Psychiatry 61 (3), 412–414.

Diagnostic and Statistical Manual of Mental Disorders, 2000. Text Revision (DSM-IV-TR), 4th Edition. American Psychiatric Association, Washington D.C.

Eisen, J.L., Phillips, K.A., Baer, L., Beer, D.A., Atala, K.D., Rasmussen, S.A., 1998. The brown assessment of beliefs scale: reliability and validity. Am. J. Psychiatry 155 (1), 102–108.

Fineberg, N.A., Dell'Osso, B., Albert, U., Maina, G., Geller, D., Carmi, L., et al., 2019. Early intervention for obsessive compulsive disorder: an expert consensus statement. Eur. Neuropsychopharmacol.

Flessner, C.A., Freeman, J.B., Sapyta, J., Garcia, A., Franklin, M.E., March, J.S., et al., 2011. Predictors of parental accommodation in pediatric obsessive-compulsive disorder: findings from the Pediatric Obsessive-Compulsive Disorder Treatment Study (POTS) trial. J. Am. Acad. Child Adolesc. Psychiatry 50 (7), 716–725.

García-Soriano, G., Rufer, M., Delsignore, A., Weidt, S., 2014. Factors associated with non-treatment or delayed treatment seeking in OCD sufferers: a review of the literature. Psychiatry Res. 220 (1–2), 1–10.

Gelman, A., Carlin, J.B., Stern, H.S., Rubin, D.B., 2003. Bayesian Data Analysis. Chapman and Hall.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Mazure, C., Fleischmann, R.L., Hill, C.L., et al., 1989a. The yale-brown obsessive compulsive scale. I. Development, use, and reliability. Arch Gen Psychiatry 46 (11), 1006–1011.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Mazure, C., Delgado, P., Heninger, G.R., et al., 1989b. The yale-brown obsessive compulsive scale. II. Validity. Arch. Gen. Psychiatry 46 (11), 1012–1016.

Goodwin, R., Koenen, K.C., Hellman, F., Guardino, M., Struening, E., 2002. Helpseeking and access to mental health treatment for obsessive-compulsive disorder. Acta Psychiatr. Scand 106 (2), 143–149.

Isomura, K., Nordsletten, A.E., Rück, C., Ljung, R., Ivarsson, T., Larsson, H., et al., 2016. Pharmacoepidemiology of obsessive-compulsive disorder: a Swedish nationwide cohort study. Eur. Neuropsychopharmacol. 26 (4), 693–704.

Issakidis, C., Andrews, G., 2003. Rationing of health care: clinical decision making in an outpatient clinic for anxiety disorders. J. Anxiety Disord. 17 (1), 59–74.

Kohn, R., Saxena, S., Levav, I., Saraceno, B., 2004. The treatment gap in mental health care. Bull World Health Organ. 82 (11), 858–866.

Koran, L.M., Hanna, G.L., Hollander, E., Nestadt, G., Simpson, H.B., 2007. Association AP. Practice guideline for the treatment of patients with obsessive-compulsive disorder. Am. J. Psychiatry 164 (7 Suppl), 5–53.

Lebowitz, E.R., Panza, K.E., Su, J., Bloch, M.H., 2012. Family accommodation in obsessive-compulsive disorder. Expert Rev. Neurother. 12 (2), 229–238.

Lin, J., Sinha, D., Lipsitz, S., Polpo, A., 2012. Semiparametric Bayesian survival analysis using models with log-linear median. Biometrics 68 (4), 1136–1145.

Lin, J., Sinha, D., Lipsitz, S., Polpo, A, 2016. Semiparametric analysis of interval-censored survival data with median regression model. In: Lin J, Wang B, Hu X, Chen K, Liu R, editors Statistical Applications from Clinical Trials and Personalized Medicine to Finance and Business Analytics. Springer, Cham, pp. 149–163.

Mayerovitch, J.I., du Fort, G.G., Kakuma, R., Bland, R.C., Newman, S.C., Pinard, G., 2003. Treatment seeking for obsessive-compulsive disorder: role of obsessive-compulsive disorder symptoms and comorbid psychiatric diagnoses. Compr. Psychiatry 44 (2), 162–168.

Mcleod, J.D., Shanahan, M.J., 1996. Trajectories of poverty and children's mental health. J. Health Soc. Behav. 37 (3), 207–220.

Miguel, E.C., Ferrão, Y.A., Rosário, M.C., Mathis, M.A., Torres, A.R., Fontenelle, L.F., et al., 2008. The Brazilian Research Consortium on Obsessive-Compulsive Spectrum Disorders: recruitment, assessment instruments, methods for the development of multicenter collaborative studies and preliminary results. Rev. Bras. Psiquiatr. 30 (3), 185–196.

Pinto, A., Mancebo, M.C., Eisen, J.L., Pagano, M.E., Rasmussen, S.A., 2006. The Brown Longitudinal Obsessive Compulsive Study: clinical features and symptoms of the sample at intake. J. Clin. Psychiatry 67 (5), 703–711.

Ramos-Cerqueira, A.T., Torres, A.R., Torresan, R.C., Negreiros, A.P., Vitorino, C.N., 2008. Emotional burden in caregivers of patients with obsessive-compulsive disorder. Depress Anxiety 25 (12), 1020–1027.

Robinson, K.J., Rose, D., Salkovskis, P.M., 2017. Seeking help for obsessive compulsive disorder (OCD): a qualitative study of the enablers and barriers conducted by a researcher with personal experience of OCD.: psychology and Psychotherapy: theory. Res. Practice 193–211.

Rosa, A.C., Diniz, J.B., Fossaluza, V., Torres, A.R., Fontenelle, L.F., De Mathis, A.S., et al., 2012. Clinical correlates of social adjustment in patients with obsessive-compulsive disorder. J. Psychiatr. Res. 46 (10), 1286–1292.

Rosario-Campos, M.C., Miguel, E.C., Quatrano, S., Chacon, P., Ferrao, Y., Findley, D., et al., 2006. The dimensional yale-brown obsessive-compulsive scale (DY-BOCS): an instrument for assessing obsessive-compulsive symptom dimensions. Mol. Psychiatry 11 (5), 495–504.

Ruscio, A.M., Stein, D.J., Chiu, W.T., Kessler, R.C., 2010. The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. Mol. Psychiatry 15 (1), 53–63.

Selles, R.R., Højgaard, D.R.M.A., Ivarsson, T., Thomsen, P.H., McBride, N., Storch, E.A., et al., 2018. Symptom insight in pediatric obsessive-compulsive disorder: outcomes of an international aggregated cross-sectional sample. J. Am. Acad. Child Adolesc. Psychiatry 57 (8), 615–619 e5.

Soomro, G.M., Altman, D., Rajagopal, S., Oakley-Browne, M., 2008. Selective serotonin re-uptake inhibitors (SSRIs) versus placebo for obsessive compulsive disorder (OCD). Cochrane Database Syst. Rev. (1), CD001765

Stein, D.J., Costa, D.L.C., Lochner, C., Miguel, E.C., Reddy, Y.C.J., Shavitt, R.G., et al., 2019. Obsessive-compulsive disorder. Nat. Rev. Dis. Primers 5 (1), 52.

Stengler, K., Olbrich, S., Heider, D., Dietrich, S., Riedel-Heller, S., Jahn, I., 2013. Mental health treatment seeking among patients with OCD: impact of age of onset. Soc. Psychiatry Psychiatr. Epidemiol. 48 (5), 813–819.

Subramaniam, M., Abdin, E., Vaingankar, J.A., Chong, S.A., 2012. Obsessive-compulsive disorder: prevalence, correlates, help-seeking and quality of life in a multiracial Asian population. Soc. Psychiatry Psychiatr. Epidemiol.

Torres, A.R., Prince, M.J., Bebbington, P.E., Bhugra, D., Brugha, T.S., Farrell, M., et al., 2006. Obsessive-compulsive disorder: prevalence, comorbidity, impact, and help-seeking in the British National Psychiatric Morbidity Survey of 2000. Am. J. Psychiatry 163 (11), 1978–1985.

Torres, A.R., Prince, M.J., Bebbington, P.E., Bhugra, D.K., Brugha, T.S., Farrell, M., et al., 2007. Treatment seeking by individuals with obsessive-compulsive disorder from the british psychiatric morbidity survey of 2000. Psychiatr. Serv. 58 (7), 977–982.

van den Heuvel, O.A., Veale, D., Stein, D.J., 2014. Hypochondriasis: considerations for ICD-11. Rev. Bras. Psiquiatr. 36 (Suppl 1), 21–27.

Velloso, P., Piccinato, C., Ferrão, Y., Perin, E.A., Cesar, R., Fontenelle, L.F., et al., 2018. Clinical predictors of quality of life in a large sample of adult obsessive-compulsive disorder outpatients. Compr. Psychiatry 86, 82–90.