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Longitudinal course of obsessive-compulsive disorder in patients with anxiety disorders: a 15-year prospective follow-up study

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Abstract

Background—Although obsessive-compulsive disorder (OCD) is typically described as a chronic condition, relatively little is known about the naturalistic, longitudinal course of the disorder. The purpose of the current study was to examine the probability of OCD remission and recurrence as well as to explore demographic and clinical predictors of remission.

Methods—This study uses data from the Harvard/Brown Anxiety Disorders Research Program, which is a prospective, naturalistic, longitudinal study of anxiety disorders. Diagnoses were established by means of a clinical interview at study intake. One hundred thirteen Harvard/Brown Anxiety Disorders Research Program participants with OCD were included in the study; all had a history of at least 1 other anxiety disorder. Assessments were conducted at 6-month and/or annual intervals during 15 years of follow-up.

Results—Survival analyses showed that the probability of OCD remission was .16 at year 1, .25 at year 5, .31 at year 10, and .42 at year 15. For those who remitted from OCD, the probability of recurrence was .07 at year 1, .15 by year 3, and by year 5, it reached .25 and remained at .25 through year 15. In predictors of course, those who were married and those without comorbid major depressive disorder (MDD) were more likely to remit from OCD. By year 15, 51% of those without MDD remitted from OCD compared to only 20% of those with MDD.

Conclusions—In the short term, OCD appears to have a chronic course with low rates of remission. However, in the long term, a fair number of people recover from the disorder, and, for those who experience remission from OCD, the probability of recurrence is fairly low.

1. Introduction

Obsessive-compulsive disorder (OCD) is characterized by recurrent, intrusive, anxiety-provoking thoughts (obsessions) and compulsive behaviors aimed at reducing distress or preventing a dreaded event [1]. Obsessive-compulsive disorder is fairly common, with prevalence estimates ranging from 1.6% to 3% [2–4]. As a disorder, it is associated with considerable impairment and disability, with research showing that individuals with OCD

often experience social and interpersonal difficulties [5,6], familial dysfunction [7], occupational problems [8,9], and impaired quality of life [6,10,11].

Not only is OCD associated with impairment and disability, but also individuals with OCD are at risk for experiencing other psychiatric conditions. Although comorbidity rates vary by study because of methodological and sampling issues, estimates suggest that 62% to 92% of individuals with OCD meet diagnostic criteria for another disorder [12–16]. Furthermore, most individuals with OCD have multiple comorbid conditions [14–16]. In particular, a high rate (21%–66%) of major depressive disorder (MDD) in those with OCD has been well documented in the literature [12,14–16]. Likewise, increased rates of anxiety disorders have been noted, with panic disorder, specific phobia, social phobia, and generalized anxiety disorder (GAD) being the most common anxiety disorders with OCD [13–17]. The exact rates of anxiety disorders in those with OCD vary vastly depending on study methodology, ranging from 13% [12] to 93% [17]. Although, overall, it appears that comorbidity is the norm rather than the exception in persons with OCD.

Obsessive-compulsive disorder is generally described as having a chronic course with periods of waxing and waning of symptoms [1]. However, relatively few studies have actually examined the course of the disorder. Early follow-up studies supported the notion of OCD being a chronic, lifelong condition [18–21]. Unfortunately, these earlier studies have major methodological limitations such as lack of standardized measures and/or definitions and basing clinical diagnoses on chart review. Results from more recent studies have been varied. In adult OCD samples, some have found low rates of remission (12%–20%) [22–24]; others, moderate rates (27%–38%) [25,26]; and some, fairly high rates of recovery (76%–86%) [27,28]. In general, remission rates reported in adults samples tend to be lower than in child or adolescents samples. However, similar to the adult literature, there is considerable variability in remission rates (32%–70%) in published studies on children and adolescents [29–34]. Thus, the course of OCD remains unclear.

The discrepancies in the literature may be due to methodological differences between studies. For instance, most studies on the course of OCD are retrospective in nature and only included one follow-up time point (“catch-up” studies), with the exception of a few studies, which were prospective and had multiple follow-up time points [22,24,25,27]. There are also differences in the samples included in past studies, with some using only psychiatric inpatients [23,31] and others being solely on samples receiving a specific treatment (eg, selective serotonin reuptake inhibitors [SSRIs], cognitive-behavioral therapy) [25,26,32]. The assessment measures used for past studies have varied a great deal as well, with 1 study relying on self-report data [27]. Furthermore, there is considerable variability in the total length of follow-up in these studies, ranging from approximately 2 years [22] to up to 40 years [23]. Given the discrepant findings in the literature and methodological limitations of the studies conducted to date, additional naturalistic, longitudinal studies are needed.

Likewise, relatively little is known about variables that predict the course of OCD. Follow-up studies examining this have identified few predictors, with little replication of findings across studies. For instance, data suggest that earlier age of onset [23], along with severity of OCD [25], may predict decreased likelihood of remission from the disorder. Furthermore, lower overall functioning [23,24] and poor insight [25,35] have been found to be associated with worse outcome. The presence of comorbid conditions may also impact the course of OCD [25,28]. Although these findings may have prognostic significance, additional studies are needed to replicate the findings.

To date, there are no published prospective, longitudinal studies on the naturalistic course of OCD that rely on adequate assessment measures, include multiple time points, and have

long-term follow-up data of greater than 5 years. Furthermore, although some research exists, there is still relatively little known about predictors of OCD course. Therefore, the purpose of the current study was to examine the naturalistic, longitudinal course of OCD in a well-characterized adult sample, including probability of OCD remission and recurrence, during 15 years of follow-up. The study uses data from the Harvard/Brown Anxiety Disorders Research Program (HARP), which is a prospective, naturalistic, longitudinal study of anxiety disorders in psychiatric patients. This study also sought to explore demographic (sex and marital status) and clinical predictors (eg, age of OCD onset, OCD as primary vs secondary diagnosis, no. of other anxiety disorder diagnoses, presence of comorbid MDD, and receiving psychiatric treatment) of OCD remission.

2. Methods

2.1. Participants and procedure

The current study is part of the HARP. The entire HARP sample consists of 711 participants with anxiety disorders recruited from 11 psychiatric practices and treatment facilities in the New England area between 1989 and 1991. The current study reports data from the 113 HARP participants who were diagnosed with OCD at intake. At study intake, all HARP participants met the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R)* [36] criteria for one or more (past or current) of the following index anxiety disorders: panic disorder without agoraphobia, panic disorder with agoraphobia (PDA), agoraphobia without a history of panic disorder, social phobia, or GAD. Other nonindex anxiety disorders, including OCD, posttraumatic stress disorder, simple phobia, and anxiety disorder not otherwise specified, were diagnosed and followed longitudinally. Inclusion criteria required participants to be at least 18 years, willing to participate, and able to sign a written informed consent form. Participants were excluded for presence of an organic brain syndrome, history of schizophrenia, or psychosis within the past 6 months.

All diagnoses were established by means of a diagnostic clinical interview administered at study intake. Those individuals who had one or more current or past index anxiety disorder diagnosis at the time of intake were invited to participate in HARP. This study was approved by the Human Subjects Review Committee. A complete description of the study was given to participants, and all participants provided written informed consent before being enrolled in the study. Follow-up assessments were conducted at 6-month and/or annual intervals during the 15 years of follow-up. All clinical interviewers had at least a bachelor's degree in psychology or a related field and underwent a rigorous, multistage training program used in other large-scale research studies conducted through Brown's Department of Psychiatry and Human Behavior. Clinical interviewers were blinded to the specific aims and hypotheses of the study, and none of the interviewers were involved in the participants' treatment. Diagnostic decisions were reviewed and approved by research personnel that included psychologists and/or psychiatrists. A more detailed description of the methods and procedures used in HARP can be found in other published reports [37,38].

2.2. Measures

2.2.1. Diagnostic clinical interview—An initial, comprehensive, diagnostic clinical interview was conducted with each participant at study intake. This interview included sections of the Structured Clinical Interview for *DSM-III-R*—Patient Version [39] and the Research Diagnostic Criteria Schedule of Affective Disorders—Lifetime [40], which were combined to produce the SCALUP (available from M.B. Keller upon request). The SCALUP provides current and past *DSM-III-R* diagnoses for nonaffective disorders, including anxiety disorders, and Research Diagnostic Criteria diagnoses for affective disorders.

2.2.2. Longitudinal interval follow-up evaluation—Upjohn—The Longitudinal interval follow-up evaluation—Upjohn (LIFE-UP) is an interviewer-administered instrument that collects detailed information on the symptomatic course of psychiatric disorders, psychosocial functioning, and treatment status [41]. Using the LIFE-UP, the status and severity of disorders are tracked by assigning a psychiatric status rating (PSR) for each psychiatric disorder. At each follow-up assessment, the severity of symptoms since the last interview are assessed by using major life events (eg, holidays, birthdays, season changes) to determine change points, which result in weekly ratings of severity. For nonindex anxiety disorders, PSR scores range from 1 to 3, with higher numbers being indicative of more severe symptoms. A PSR of 3 indicates that full *DSM-III-R* diagnostic criteria are met; a PSR of 2, subsyndromal or residual symptoms that do not meet full diagnostic criteria; and a PSR of 1, the participant is symptom-free. The course of disorders is examined through remission and recurrence rates, which are defined prospectively. *Full remission* from OCD is defined as 8 consecutive weeks at a PSR of 1. *Recurrence* is defined as 4 consecutive weeks at a PSR of 3 after a remission. Research on the psychometric properties of the LIFE-UP has found good to excellent interrater reliability on the PSRs as well as excellent long-term test-retest reliability [42]. The LIFE-UP has been found to have good concurrent and discriminant validity.

2.3. Statistical analyses

Statistical analyses were conducted using SAS version 9.1.3 (SAS Institute Inc., Cary, NC) [43] and the procedures of PROC FREQ, PROC MEANS, PROC PHREG, and PROC LIFETEST. Course data were examined using standard survival analysis methods [44]. Data for participants who were lost to follow-up were censored at the time of dropping out the study. Cox regression analyses [45] were used to examine predictors of remission from OCD during the 15-year follow-up period. A series of individual proportional hazards regression analyses were conducted to examine whether certain intake characteristics were predictive of recovery from OCD. The following demographic and clinical predictors from intake were examined: sex, marital status, age of OCD onset, OCD as primary vs secondary diagnosis, total number of other anxiety disorders, comorbid MDD, and treatment participation.

3. Results

3.1. Demographic and sample characteristics

At intake, 113 participants were diagnosed with OCD. Most of the sample (58%, or $n = 65$) was female, with a mean age of 35.21 years (SD, 11.95). Approximately 49% ($n = 55$) were never married; 41% ($n = 46$), married; and 10% ($n = 12$), separated or divorced at the time of intake. The sample was 97% ($n = 110$) white; 1% ($n = 1$), African American; 1% ($n = 1$), Native American; and 1% ($n = 1$), multiracial. Participants were fairly well educated, with 40% of the sample ($n = 45$) having earned a 4-year college degree or more, 34% ($n = 38$) having completed some college and/or earned an associate's degree, 18% ($n = 20$) reporting at most a high school degree or a General Education Diploma (GED), and 8% ($n = 9$) having less than a high school degree. The frequency of attrition (eg, being unable to be located, no longer wanting to participate) at each time point during the 15 years of follow-up was 12 participants at year 1; 10, at year 2; 6, at year 3; 6, at year 4; 2, at year 5; 4, at year 6; 4, at year 7; 5, at year 8; 0, at year 9; 2, at year 10; 4, at year 11; 4, at year 12; 3, at year 13; 3, at year 14; and 6, at year 15.

3.2. Clinical and treatment characteristics

The sample had high rates of comorbidity with other anxiety disorders, with only 22% of the sample ($n = 25$) having no other current anxiety disorder diagnosis besides OCD at intake.

More than 43% of the sample ($n = 49$) had one comorbid anxiety disorder diagnosis, 22% ($n = 25$) had 2, 12% ($n = 13$) had 3, and 1% ($n = 1$) had 4 other anxiety disorder diagnoses at intake. For most of the sample (53.98%, or $n = 61$), OCD was the first anxiety disorder to onset. The most common comorbid anxiety disorder diagnosis was PDA, followed by GAD and social phobia. Major depressive disorder was comorbid in a substantial portion of the participants, with one third of the sample having MDD at intake. Table 1 displays clinical characteristics of the sample. Much of the sample was receiving psychiatric treatment at intake, with more than half (54.29%, or $n = 57$) being involved in psychosocial treatment, 44.76% ($n = 47$) receiving SSRIs, and 26.67% ($n = 28$) receiving benzodiazepines. Table 2 displays psychiatric treatment rates during the 15 years of follow-up based on the number of participants at each follow-up time point.

3.3. Longitudinal course of OCD

3.3.1. Remission—Standard survival analysis using Kaplan-Meier life tables were conducted to examine the course of OCD. Fig. 1 displays the cumulative probability of remitting from OCD during the 15 years of follow-up. At year 1, the probability of fully remitting (ie, 8 consecutive weeks of a PSR of 1) from OCD was .16, and, by year 5, the cumulative probability was .25. At year 10, the remission probability increased to .31, and, by year 15, the probability of remission was .42.

3.3.2. Recurrence—For those individuals who experienced a full remission from OCD, the probability of recurrence was examined. Fig. 2 displays the cumulative probability of recurrence during the 15 years of follow-up. At year 1, the probability of OCD recurrence (ie, 4 consecutive weeks of a PSR of 3) was .07; by year 3, the cumulative probability was .15, and, by year 5, it reached .25 and remained there for the rest of the follow-up period.

3.4. Predictors of OCD course

Proportional hazards regression analyses were conducted to examine whether demographic and clinical characteristics were predictive of OCD course. Table 3 displays the results of these analyses. Marital status at the time of intake predicted remission from OCD, with those who were married being more likely to remit from the disorder (Wald $\chi^2 = 5.82$, hazard ratio [HR] = 2.34, $P < .05$). Furthermore, those who were receiving a SSRI at intake were less likely to remit from OCD (Wald $\chi^2 = 4.46$, HR = 0.46, $P < .05$). Follow-up analyses were conducted to determine if marital status and SSRI use were related to OCD symptom severity at intake (the mean OCD PSR score in the first 4 weeks of follow-up was used because no PSR scores were assigned at intake). Marital status was not related to OCD symptom severity, $t_{102} = 0.53$, $P = .60$. There was trend for SSRI use being associated with OCD symptom severity, $t_{102} = -1.91$, $P = .06$, with those using SSRIs at intake having more severe OCD symptoms (mean, 2.89; SD, 0.31) than those not using SSRI (mean, 2.70; SD, 0.62). Results from the proportional hazards regression analyses also showed that having comorbid MDD at intake was associated with a decreased likelihood of recovery from OCD in the follow-up period (Wald $\chi^2 = 5.12$, HR = 0.33, $P < .05$). Fig. 3 displays the cumulative probability of full remission from OCD by comorbid MDD at intake. By year 15 of follow-up, those with comorbid MDD only had a .20 cumulative probability of OCD remission compared to a .51 probability of remission in those without comorbid MDD at intake. There were no other significant predictors of OCD course.

4. Discussion

Although OCD is believed to have a chronic course, little research has been conducted on this, and there are discrepant findings in literature. To date, there are no published

prospective, longitudinal studies on the naturalistic course of OCD that rely on adequate assessment measures, include multiple time points, and have a long-term follow-up period of greater than 5 years. Furthermore, relatively little is known about factors that predict the course of the disorder. Thus, the purpose of the current study was to examine remission and recurrence rates of OCD during 15 years of follow-up as well as to explore predictors of remission using data from 113 participants with OCD from the HARP study. The HARP study is a large-scale, prospective, naturalistic, longitudinal study of anxiety disorders in psychiatric patients. It should be noted that all participants in the current study had a history of at least one other anxiety disorder in addition to OCD.

The findings from this study suggest that rates of remission from OCD vary considerably over time, depending on the length of follow-up. In the short term, remission rates were relatively low, with only 16% of those with OCD remitting from the disorder in the first year after intake. However, the remission rate gradually increased over time, reaching 25% at year 5, 31% at year 10, and 42% at 15 years postintake. These data suggest that, in the short term, although OCD does tend to have a chronic course with low rates of recovery, in the long term, a substantial proportion of those with the disorder do, in fact, experience a remission of symptoms. Furthermore, the results show that, for those who experience a remission from OCD, the recurrence rates are fairly low, with a rate of 7% at year 1, 15% at year 3, and 25% at year 5 and beyond. Thus, for most individuals who recover from OCD, they remain symptom free.

Comparing the current findings to past studies is challenging, given the differences in study methodology and sampling issues. Furthermore, there is a great deal of variability in the findings from previously published reports, with remission rates ranging from as low as 12% [22] to more than 75% [27,28]. The remission rates in the current study are fairly comparable to those found in adult samples by Eisen et al [22] (12% remission rate at a 2-year follow-up), Steketee et al [24] (20% at 5 years), and Rufer et al [26] (27% at 6–8 years). However, our rates are higher than Skoog and Skoog [23] (20% at 40 years) and lower than those reported by Catapano et al [25] (38% at 3 years), Reddy et al [28] (76% at 11–13 years), and Angst et al [27] (86% at 20 years). Not surprisingly, the remission rates of the current study were lower than those reported in child samples [29,30,32–34], perhaps reflecting phenomenological and/or developmental differences in childhood and adult OCD.

For predictors of course, married individuals had an increased likelihood of recovering from OCD. Previous longitudinal and treatment outcome studies have also found marital status being predictive of better outcome [24,46,47]. Marital status may be related to severity of symptoms and overall functioning, which, in turn, could be predictive of recovery. However, our follow-up analyses did not support this explanation, in which no relationship was found between marital status and OCD severity. Instead, it is possible that having a marital partner could be a protective factor in which the significant other may provide social support and/or assistance in addressing symptoms, making remission from the disorder more likely.

Results from the current study showed that patients receiving SSRIs were less likely to remit from OCD; however, this finding should be interpreted with caution. Because this was a naturalistic study and treatment was not manipulated, no statements can be made regarding the efficacy of treatment. In addition, it is unknown whether the treatments received in the current study were prescribed specifically for OCD because data are not collected on this in the HARP study. It is possible that the individuals on SSRIs may have been receiving such medication for treatment of comorbid conditions such as MDD, which, in turn, could impact the course of OCD. Furthermore, this finding is likely a result of the treatment bias effect, which is often found in naturalistic, longitudinal studies. The treatment bias effect refers to the phenomenon whereby individuals with more severe symptoms and impairment are more

likely to receive treatment. Because severity of symptoms is negatively related to likelihood of remission, such individuals are less likely to recover, thus, explaining the association between treatment and course of the disorder. Follow-up analyses in the current study supported this explanation, and indeed, previous naturalistic, longitudinal studies on OCD [24] and other anxiety disorders [48–50] have found either a negative relationship or no relationship between treatment and outcome, likely because of the treatment bias effect.

Comorbid MDD was negatively related to OCD remission. By the end of the 15-year follow-up period, only 20% of participants with comorbid MDD recovered from OCD compared to 51% of those without MDD. Longitudinal studies on other anxiety disorders have had similar findings [48–50]. There are several possible explanations for these findings. Those with comorbid depression may have more severe OCD symptoms, making recovery less likely. Indeed, previous research has shown that individuals with comorbid depression have worse obsessive-compulsive symptoms than those without depression [51–53]. It is also possible that depression may influence the effects of OCD treatment. Findings from previous treatment research on this have been mixed. Some studies have shown that depression attenuates the effects of OCD treatment [54–57], whereas others have not found a relationship between depression and OCD treatment response [58–61]. It remains unclear whether depression impacts treatment response in OCD. However, our findings from this naturalistic, longitudinal study do suggest that depression has prognostic significance, in which those with depression had a strikingly different outcome related to their OCD than those without depression, suggesting a need for additional research in this area.

There are several important considerations when interpreting the findings from the current study. The sample had a higher rate of comorbidity than what has been reported in the literature [12,14], with 78% of our sample having another anxiety disorder besides OCD at study intake. This is not surprising, given that participants in the HARP study were required to have another current or past anxiety disorder for inclusion. It has been noted that “pure culture” diagnoses in anxiety disorders are rare [62]. Nonetheless, it is possible that the course of symptoms in a pure OCD sample may be different. In our sample, we examined whether the number of comorbid anxiety disorders and/or if OCD was the primary vs secondary diagnosis were predictive of remission, and neither were found to be associated with recovery from OCD. Additional research is needed, though, to determine if the course of the disorder varies in pure culture samples and/or samples with lower comorbidity rates.

Another limitation to the study is that our sample was recruited in psychiatric practices. Thus, our sample may have had more severe symptoms and/or impairment than a nontreatment-seeking sample. Given that past research has found that those with more severe OCD are less likely to remit from the disorder [25], it is possible that our rates of remission are lower than what one might find in a less severe sample or in a nonclinical setting. Furthermore, our sample was primarily white, with a fairly high level of education. It is unclear how our results generalize to a broader, more diverse, community sample, so additional research is needed in this area. Given the long-term nature of the HARP study, recruitment occurred some time ago; thus, it is possible that the naturalistic course of OCD in these patients could be different than in contemporaneous sample. Furthermore, our study examined the disorder as a whole, and it did not use a more specialized measure such as the Yale-Brown Obsessive-Compulsive Scale [63]. It would be useful for future research to include a more thorough measure of OCD to examine changes in specific symptom domains over time and to determine whether certain OCD subtypes have different trajectories. Future research should also examine potential predictors of OCD recurrence after remission, which was not possible in the current study because of the relatively small number of recurrences.

Overall, this study contributes to the literature in which it is the longest term, naturalistic, prospective, longitudinal study on OCD in a well-characterized sample that relies on adequate assessment measures and includes multiple follow-up time points. Our findings suggest that, in the short term, OCD appears to have a chronic course with low rates of recovery. However, in the long term, results are more promising, in which a fair number of people do, in fact, recover from the disorder. In particular, married individuals and those without comorbid MDD are more likely to experience a remission from OCD. Furthermore, there are relatively low rates of recurrence in those who remit from the disorder. These findings provide useful information about the course of the disorder as well as highlight the importance and need for additional research in this area.

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Fig. 1.
Cumulative probability of full remission from OCD in 113 patients.

Fig. 2.
Cumulative probability of relapse after remission from OCD among a subset of 113 patients.

Fig. 3.
Cumulative probability of full OCD remission by comorbid MDD.

Table 1

Clinical characteristics of 113 patients with OCD at intake

Variables	Mean (SD)
Age of OCD onset (y)	17.42 (10.44)
Years since OCD onset	17.89 (11.84)
Global Assessment of Functioning score	52.61 (9.97)
No. of other anxiety disorder diagnoses	1.26 (0.96)
	<i>n (%)</i>
Comorbid disorders	
Panic disorder without agoraphobia	8 (7.08)
PDA	39 (34.51)
Agoraphobia without history of panic disorder	4 (3.54)
Social phobia	28 (24.78)
GAD	33 (29.20)
Posttraumatic stress disorder	14 (12.39)
Simple phobia	12 (10.62)
MDD	37 (32.74)

Table 2
Psychiatric treatment received in a sample of 113 patients with OCD during follow-up

Years since intake	Frequency of treatment received					
	SSRIs		Benzodiazepines		Psychotherapy	
	n	(%)	n	(%)	n	(%)
1	58	56	23	22	93	89
2	45	48	19	20	61	59
3	39	46	18	21	34	33
4	38	48	14	18	23	22
5	39	51	12	16	30	29
6	43	59	13	18	25	24
7	44	62	13	18	18	17
8	41	64	11	17	16	15
9	42	66	12	19	10	10
10	40	65	11	18	10	10
11	37	64	12	21	20	19
12	36	62	13	22	20	19
13	33	61	12	22	20	19
14	30	63	14	29	20	19
15	32	68	14	30	20	19

Treatment rates were calculated based on number of participants at each follow-up time point.

Table 3

Proportional hazards regression analyses examining predictors of remission from OCD

Predictor	Wald χ^2	P	HR	95% confidence interval
Sex	0.19	.67	1.16	0.58–2.33
Marital status	5.82	.02	2.34	1.17–4.68
Age of OCD onset (y)	1.11	.29	1.02	0.99–1.05
OCD primary vs secondary diagnosis	1.99	.16	0.62	0.31–1.21
Total no. of comorbid anxiety disorders	2.54	.11	1.32	0.94–1.86
Comorbid MDD	5.12	.02	0.33	0.13–0.86
SSRI use	4.46	.03	0.46	0.22–0.95
Benzodiazepine use	0.14	.71	1.16	0.54–2.48
Psychosocial treatment	0.11	.74	0.89	0.45–1.78