Research Article

SELF-RATED IMPORTANCE OF RELIGION PREDICTS ONE-YEAR OUTCOME OF PATIENTS WITH PANIC DISORDER

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Cognitive-behavioral therapy and medication are efficacious treatments for panic disorder, but individual attributes such as coping and motivation are important determinants of treatment response. A sample of 56 patients with panic disorder, treated with group cognitive-behavioral therapy, were reassessed 6 months and 12 months after initial assessment. We studied the effect of self-rated importance of religion, perceived stress, self-esteem, mastery, and interpersonal alienation on outcome as measured by the General Severity Index of the Brief Symptom Inventory (BSI.GSI). Importance of religion was a predictor of BSI.GSI symptom improvement at 1 year. Over time, improvement was seen for the religion is very important subgroup in the BSI.GSI and Perceived Stress Scales. This study suggests that one mechanism by which high importance of religion reduces psychiatric symptoms is through reducing perceived stress. Depression and Anxiety 23:266–273, 2006. *© 2006 Wiley-Liss, Inc.*

Key words: *treatment outcome; panic disorder; religion and psychology; adult; middle age; cognitive therapy*

INTRODUCTION

Panic disorder (PD) is a common anxiety disorder, with a lifetime prevalence of 4.7% (standard error of mean [*SE*] = 0.2), that markedly impairs the lives of patients and caregivers [Kessler et al., 2005; Mogotsi et al., 2000]. The condition is costly to the general medical system, because most patients at some time believe that they suffer from a serious physical illness and seek medical treatment [Lynch and Galbraith, 2003; Marciniak et al., 2005]. There are effective treatments with cognitive-behavioral therapy (CBT) and/or medication, but up to 40% of patients do not obtain optimum benefit from current treatments [Barlow et al., 2000; Gould et al., 1995; Landon and Barlow, 2004]. The outcome can be variable, with some patients remitting, whereas others develop depression or other comorbid conditions [Katschnig and Amering, 1998; Landon and Barlow, 2004]. Nonclinical panic attacks are even more common, as much as 14% of the population or higher, depending on the method of ascertainment [Norton et al., 1992]. The occurrence of panic attacks is associated with higher odds of developing other anxiety, substance abuse, and mood disorders [Goodwin et al., 2004].

Several randomized medication studies have shown a high placebo response rate, suggesting that individual differences and nonspecific factors are important in outcome [Ballenger et al., 1998; Cox et al., 1991; Pollack et al., 1998]. Among those who do seek treatment for panic attacks, predictors of negative outcome include long duration of illness, comorbid psychiatric conditions such as agoraphobia and mood disorders, and substance abuse and personality disorders [Katschnig and Amering, 1998; Slaap and den Boer, 2001]. Predictors of a favorable outcome are less well researched but include a shorter duration of

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illness, self-directed exposure, mastery, and attendance at CBT training [Bowen et al., 1994; Faravelli and Albanesi, 1987; Katschnig and Amering, 1998].

We are not aware of prospective treatment studies of the effect of religious/spiritual practices and beliefs on PD. A recent review that summarized the cross-sectional literature on the association between religion and anxiety found studies that showed positive, negative, and lack of association results [Shreve-Neiger and Edelstein, 2004]. Differences in findings were attributed to differences in population and sample size, and different conceptualizations of religion and anxiety [Kendler et al., 2003; Koenig et al., 1993; Shreve-Neiger and Edelstein, 2004]. In particular, one tentative conclusion was that those who "live" their religion (intrinsic) endorse less anxiety than those who "use" their religion (extrinsic), but other studies have concluded that the social dimension of attendance at worship may be beneficial to some people with anxiety [Koenig et al., 1993; Shreve-Neiger and Edelstein, 2004].

Engagement in the practice of organized religion has many health benefits, such as less use of substances, and this might have an indirect effect on the outcome of PD [George et al., 2000; Kendler et al., 2003; Shreve-Neiger and Edelstein, 2004]. In one of the larger studies using Wave II Epidemologic Catchment Area (ECA) data from the Piedmont region church, attendance was associated with a lower rate of anxiety disorders for younger adults, controlling for sex, number of chronic illnesses, recent negative life events, and social support. However, the results were not significant for PD [Koenig et al., 1993]. Some forms of private spirituality, such as religious TV viewing, were associated with higher rates for anxiety disorders, but again, the results for panic were not significant [Koenig et al., 1993]. A large twin study that controlled for age, sex, and years of education found that general religiosity (involvement with God and spiritual issues) was associated with increased likelihood for PD but decreased likelihood for drug and alcohol dependence and adult antisocial behavior [Kendler et al., 2003]. There is little longitudinal research on coping resources in patients with PD. Recently, in a cross-sectional study, three strategies related to religious coping were reported to be different between African Americans and European Americans with PD, namely, counting one's blessings, religiosity, and self-blame [Smith et al., 1999].

The purpose of this study was to examine (1) the effect of self-rated importance of religion on the 1-year outcome of a cohort of patients with PD and (2) the relative effect of importance of religion compared with common psychological traits such as self-esteem, interpersonal alienation, mastery, and perceived stress. Outcome was measured by the General Severity Index of the Brief Symptom Inventory (BSI.GSI). We used available data, from a study originally designed to assess the effect of social factors on the outcome of panic, that also included a question on importance of religion in the assessment interview [Bowen and D'Arcy, 2003].

METHODS

We recruited males and females with diagnoses of PD between the ages of 18 and 60 years. We recruited all volunteers to the study; at the time we did not note the proportion of subjects that volunteered, but the participation rate was high. There were 106 volunteers, 86 had primary diagnoses of PD according to DSM-III-R criteria, but after excluding patients with histories of bipolar I, psychotic, organic brain, or substance dependence disorders, and those without complete data at times T0, T6, and T12, the final sample was 56 participants. All subjects gave informed consent.

TREATMENT

Psychiatrists and family physicians referred directly to a university hospital-based outpatient group CBT program conducted by two nurse therapists, each with 5 years' experience in the CBT treatment of panic. At the time that this study was done, the group was open and continuous. Sessions lasted 2 hours (with a break) and included 10–15 patients and support persons. Each session included a review of symptoms and homework, an exposure task for the following week, applied relaxation, relaxed breathing, discussion of and correction of cognitive distortions, and practice of interoceptive exposure strategies [Craske and Barlow, 1990; Craske et al., 1989; Martinsen et al., 1998]. Participants attended until they themselves and the therapists agreed that they had experienced optimum benefit. Individual sessions with the therapists could be arranged if needed. Attendance data were not available, but a study done around the same time on a different sample from the same program found that participants who did well attended an average of 5.9 ($SD = 7.1$) groups and 3.8 ($SD = 4.3$) individual sessions, whereas those who did poorly attended 3.5 ($SD = 4.7$) groups and 2.7 ($SD = 2.9$) individual sessions [Bowen et al., 1994]. Patients continued on medication prescribed by their physicians, but they were asked to review dosing with their physicians if they were taking higher doses of benzodiazepines (more than the equivalent of approximately 2 mg of lorazepam).

PROCEDURES

Volunteers for the study were requested at the first treatment session, and initial assessment interviews were done within a week. At the first assessment, a single, trained interviewer used the Diagnostic Interview Schedule (DIS) version III-A from which DSM-III-R diagnoses were derived by computer algorithm [Regier et al., 1984]. He also collected the subject-completed questionnaires. Different research assistants, blind to the diagnosis, collected the follow-

up questionnaires 6 months (T6) and 12 months (T12) after the initial interview. The assistants helped with questionnaire instructions, but the subjects completed the assessments on their own. The following measures that were done at the first interview (T0) were repeated at T6 and T12.

MEASURES

Brief Symptom Inventory (BSI). This 53-item scale records the extent to which subjects experience physical and psychological symptoms [Derogatis and Melisaratos, 1983]. We modified the responses by deleting the "moderately" middle category to force a choice between symptoms being present or not. We analyzed the General Severity Index (GSI) as a global measure of severity. The BSI.GSI demonstrates adequate reliability and validity and is sensitive to change with treatment [American Psychiatric Association, 2000; Derogatis and Melisaratos, 1983].

In an exploratory study, we analyzed the sum of the anxiety and phobic anxiety subscales as a measure of anxiety, and the depression subscale as a measure of depression. The reliability and validity of the subscales have been questioned but the test–retest reliability is high and the correlations with similar scales from the Minnesota Multiphasic Personality Inventory (MMPI) and the Brief Psychiatric Rating Scale (BPRS) are reasonable [anxiety (.57 and .46, respectively) and depression (.72 and .69, respectively); Derogatis and Melisaratos, 1983; Morlan and Tan, 1998]. The correlation of the phobic anxiety subscale with the similar scale from the MMPI was .45 [Derogatis and Melisaratos, 1983].

Perceived Stress Scale (PSS). The PSS measures the degree to which respondents appraise their lives as stressful. The 14-item version was used. High scores represent high stress [Cohen et al., 1983]. This scale is affected by daily hassles in subjects' lives and so would not be expected to be stable over long periods. It demonstrates good reliability, and the score is associated with health care utilization. The main criticism of the scale is that because it may be another measure of general distress, it therefore cannot be used convincingly to represent the effects of life stress [American Psychiatric Association, 2000].

Pearlin–Schooler Mastery Scale (MS). This 7-item scale scored on a 4-point format measures the extent to which one's life is considered to be under one's own control. High scores represent a strong sense of mastery [Pearlin and Schooler, 1978]. The test–retest reliability over 3–4 years was .33, and it does correlate in the expected direction with related scales [Seeman, 1991]. A previous report using a separate sample from this program had shown that mastery and depression predicted global clinical outcome determined by the nurse–therapists [Bowen et al., 1994].

Rosenberg Self-Esteem Scale (RSE). The widely used RSE [Rosenberg, 1965] measures stable concepts of self-regard, but feelings of efficacy and identity are also imbedded. It consists of 10 items scored on a 4-point response format, and high scores represent lower self-esteem. The internal consistency ranges from .77 to .88, the test–retest reliability is .82, and the test correlates positively with other measures of self-esteem and negatively with measures of low self-regard [Blascovich and Tomaka, 1991].

Interpersonal Alienation (IA). The 12-item Interpersonal Relations subscale from the 60-item IA test was designed to describe individuals who are low in alienation, have a sense of purpose and commitment, and tend to have an internal locus of control. Answers were coded from 1 = *completely disagree* to 7 = *completely agree*. Higher scores describe higher alienation [Kobasa, 1979; Maddi et al., 1979].

Importance of Religion (IR). The IR was measured by a single question: "How important is religion to you now?" Answers were recorded in a 4-point format: 1 = *No importance*, 2 = *Little importance*, 3 = *Fairly important*, and 4 = *Very important*. A similar question on IR, either alone or in combination with other questions, was used in the Wave II National Institute of Mental Health (NIMH) ECA study in the Piedmont, North Carolina, region—"How important is religion to you?", in the Americans' Changing Lives survey—"In general, how important are religious and spiritual beliefs in your day-to-day life?", and also by the Gallup Poll and Statistics Canada [Koenig et al., 1993; Schnittker, 2001]. Used as a single question in our study, IR would probably convey a meaning of global religious salience [Schnittker, 2001; Shreve-Neiger and Edelstein, 2004].

DATA ANALYSIS

Values from the IR measure at T12 were used as a predictor variable in the multiple regression analyses and as the between factor in the repeated measures analyses of variance (ANOVAs), because the T12 IR value would apply to IR in the period between the T0 and T12 assessments. Assuming that participants answered the IR question with respect to the recent past, the T0 value would apply to the period of time before the study, and before the period of change with treatment [Schnittker, 2001]. We were interested in determining the effect of IR during the period of treatment and consolidation after treatment. The percentage of participants at the *No importance*, *Little importance*, *Fairly important*, and *Very important* levels for IR at T0 were 11%, 30%, 32%, and 27%, respectively, and 13%, 32%, 34%, and 21%, respectively, at T12. The test–retest reliability between T0 and T12 was highly significant (Spearman $\rho = .61$, $P < .000$). (Data for the social and leisure activities section of the Weissman Social Adjustment Scale [SAS] were also collected as part of the study but did not improve with time, did not interact with IR over

time, and did not predict improvement in the BSI. GSI, and so were not used in the analyses [Bowen and D'Arcy, 2003]).

The hypothesis was that IR affects outcome (measured by BSI.GSI ratings) at T12. To determine this, we used hierarchical linear regression analysis with the BSI.GSI ratings at T12 as the outcome variable. We entered age and sex as covariates, because they had a small but significant effect in a study on the costs of treating anxiety [Marciniak et al., 2005]. Bipolar disorder is a common and important comorbid condition with PD, and lifetime presence of hypomanic symptoms affected treatment outcome measured with the MS and the BSI phobic anxiety scales in a previous study with this sample of patients [Bowen and D'Arcy, 2003; Goodwin and Hoven, 2002]. The BSI.GSI rating at T0 was entered to control for baseline symptom ratings. In the first model, we entered the T12 IR levels coded as dummy variables with the *no importance* group as the reference group. In the second model we entered perceived stress (PSS), self-esteem (RSE), mastery (MS), and interpersonal alienation (IA) measured at T12 to control for psychological qualities that might impact improvement. In the final (third) model, only T12 IR levels and PSS were retained, because only they retained significance.

To address the secondary question, we used repeated measures ANOVAs to determine whether the four levels of IR (between factor) are associated with differential improvement in psychological variables with time. We used five separate repeated measures ANOVAs with three levels of the within-time factor (T0, T6, T12), for BSI.GSI, PSS, MS, RSE, and IA. We entered age, sex, and the history of hypomania as covariates.

In an exploratory analysis using repeated measures ANOVAS, we investigated whether reduction of perceived stress is the mechanism by which CBT benefits patients in the *very important* IR category. We reasoned that the repeated measures ANOVA of the summed BSI anxiety and phobia subscales would show a significant time by IR interaction, using the BSI depression subscale for comparison.

RESULTS

The mean age of subjects was 33.9 years ($SD = 8.4$, range, 18–58 years). There were 37 females and 19 males. Subjects were mostly high school graduates, with a mean of 13.0 years of education ($SD = 12.6$), and the majority were employed or worked in the home. The occurrence of lifetime comorbid diagnoses was high (e.g., 73.4% with agoraphobia, 55.6% with major depression, and 32.1% with hypomanic symptoms). Subjects in the four levels of response to the IR question did not differ in gender or age.

The results of the regression analyses are presented in Table 1. In the first regression model, the *very important* group was the only significant predictor of BSI.GSI score at T12 [$\beta = -.582$, $t = -2.95$, $P = .005$, 95% confidence interval (CI) = −38.58 to −7.28]. The adjusted R^2 was .227 and the R^2 change for IR was .147, indicating that 14.7% of the BSI.GSI variance was accounted for by IR.

In the second regression model, only IR ($\beta = -.292$, $t = 2.07$, $P = .045$, 95% $CI = -22.68$ to −0.28) and PSS ($\beta = .656$, $t = 5.03$, $P = .000$, 95% $CI = 0.792$ to 1.851) were significant predictors of BSI.GSI at T12. There was an R^2 change of .406, indicating that 40.6% of the variance of the BSI.GSI was accounted for by the RSE, the MS, the IA and the PSS. There was a 47% reduction in the value of β for IR *very important*.

In the third regression model, both IR (specifically the *very important* group) ($\beta = -.352$, $t = -2.64$, $P = .011$, 95% $CI = -24.42$ to -3.30) and PSS ($\beta = .732$, $t = 7.99$, $P = .000$, 95% $CI = 1.10$ to 1.85) were significant predictors of the BSI.GSI at T12. There was an R^2 change of .388, indicating that 39% of the BSI.GSI variance was accounted for by perceived stress. There was a 39.5% reduction in the value of β for IR *very important*. This indicates that after IR and perceived stress were entered into the equation, very little change occurred by adding the other three psychological variables.

The results of the repeated measures ANOVAs are summarized in Table 2. The BSI.GSI showed a significant within-subjects time effect, indicating that

TABLE 1. Linear regression of BSI.GSI (T12) and Adjusted β's and (Confidence Intervals)

Independent variables	Model 1 β (95% CI)	*P*	Model 2 β (95% CI)	*P*	Model 3 β (95% CI)	*P*
Religion very important	−.582 (−38.58 to −7.28)	.005	−.292 (−22.68 to −.28)	.045	−.352 (−24.42 to −3.30)	.011
Perceived Stress (PSS)			.656 (.79 to 1.85)	.000	.732 (1.10 to 1.85)	.000
Self-Esteem (RSE)			.172 (−.17 to 1.23)	.14		
Pearlin Mastery (MS)			−.060 (−.52 to .21)	.61		
Interpersonal Alienation (IA)			−.101 (−.52 to .21)	.40		
R^2 adjusted	.227		.665		.665	

Adjusted for BSI.GSI T0, Age, sex, and lifetime presence of hypomanic symptoms.

TABLE 2. Repeated measures ANOVA for within subjects factor of time

	Time as the within-subject factor			Time × IR interaction		
Variable	*df*	*F*	*P*	*df*	*F*	*P*
BSI.GSI (total)	2	5.91	.004	6	2.99	.01
BSI Anxiety+Phobia subscale	2	2.92	.06	6	3.68	.002
BSI Depression subscale	2	2.00	.14	6	.98	.44
RSE	2, 48	1.2	.31	6, 98	1.29	.27
Pearlin Mastery	2	.04	.96	6	.47	.83
Interpersonal Alienation	2, 48	.90	.41	6, 98	1.11	.36
Perceived Stress	2, 48	.51	.61	6, 98	3.88	.002

Age, sex, and lifetime presence of hypomanic symptoms controlled.

participants improved on symptom scores over the 12-month follow-up period. There was a significant IR by time interaction for the BSI.GSI, the BSI anxiety/phobia subscale, and the PSS (Table 2). The significant interaction and the plots (Fig. 1) indicate that that the *very important* group improved more than the other 3 IR groups when the BSI.GSI, BSI anxiety and phobic anxiety subscales, and the PSS were used as the within-subject variables.

Addressing the question about reduction of perceived stress as a mechanism by which IR could have an effect on improvement in symptoms, the significant time × IR interaction for the anxiety plus phobia subscales contrasted with the nonsignificant result for the depression subscale suggests that improvement in the *very important* group occurs through reduction of perceived stress as opposed to a reduction in depressive symptoms.

If the follow-up data were not available and we had confined the analysis to a cross-sectional study at T0, there would have been no significant association between IR and the symptom and psychological measures. We determined this by using a multivariate analysis of variance (MANOVA) with the BSI.GSI, RSE, MS, IA, and PSS as dependent variables, and IR at T0 as the categorical variable.

DISCUSSION

In this study of the 1-year outcome of CBT treatment of PD, we showed that self-rated importance of religion is more important in determining outcome than age, sex, lifetime presence of hypomanic symptoms, self-esteem, mastery, or interpersonal alienation. The proportions of responses of *Very important* (21.4%), *Fairly important* (33.9%), *Little importance* 32.1%, and *No importance* (12.5%) to the IR question in our study is similar to the proportions from the Canadian National Population Health Survey in response to the question "How religious or spiritual do you consider yourself to be?" of *Very* (17%), *Moderately* (50%), *Not very* (20%), and *Not at all* (13%) [Baetz et al., 2004]. This gives some credence to the results from a single question on IR in a relatively small sample in our study.

PSS was the only psychological variable of four (PSS, MS, RSE, and IA) that showed a significant interaction with time (i.e., the *very important* IR group improved significantly more than the other 3 IR groups on the PSS). The finding that the BSI anxiety/phobia subscale also showed a significant time × IR interaction, with the *very important* group improving most, whereas there was no interaction effect for the BSI depression subscale, suggests that reduction of PSS could be one mechanism by which IR exerts an effect on the BSI.GSI. Anxiety symptoms were the target of treatment, and worry and stress are more directly associated with anxiety and phobias than with depression [Hettema et al., 2004].

The *very important* group appeared to present with more severe symptoms at T0 (Fig. 1), raising the issue that people with panic may turn to religion or that some forms of religious involvement might have negative effects [Koenig et al., 1993; Schnittker, 2001]. The differences between the groups at T0 were not significant (BSI.GSI: $F = 2.12$, $P = .10$; PSS: $F = 1.11$, $P = .36$; BSI anxiety/phobia subscales: $F = 1.12$, $P = .35$), nor were the differences for the MS, RSE, IA, or BSI depression scales. If the study had been confined to a cross-sectional analysis at T0, the conclusion would have been that there was no association between IR and BSI symptoms, self-esteem, mastery, interpersonal alienation, and perceived stress. Previous studies on anxiety and religion that have used cross-sectional data have yielded inconsistent results [Kendler et al., 2003; Koenig et al., 1993; Shreve-Neiger and Edelstein, 2004].

A possible conclusion is that during and after CBT for panic and agoraphobia, importance of religion affects outcome (BSI.GSI at T12) in the *very important* IR subgroup through a greater reduction in perceived stress (PSS) compared with subgroups for whom religion is less important. This conclusion is consistent with results in the literature on cross-sectional studies showing that in nonclinical populations, higher self-rated spirituality/religiousness is associated with lower perceived stress [Pargament, 2002; Shreve-Neiger and

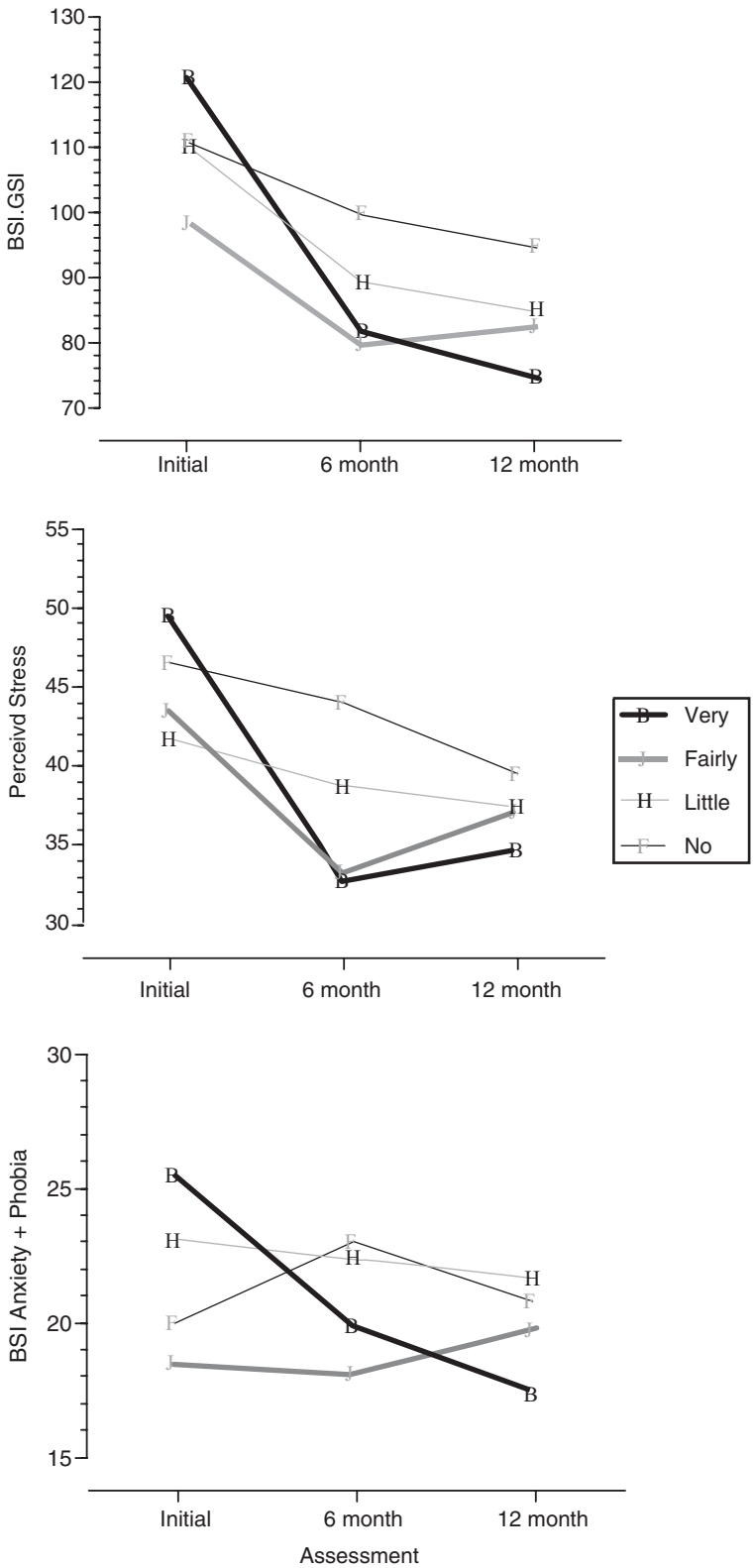

Figure 1. Mean values on three scales (BSI.GSI, Perceived Stress, BSI Anxiety/Phobia) for four possible responses (*Very important*, *Fairly important*, *Little importance*, *No importance*) to the question "How important is religion?" at the initial assessment (T0), 6-month assessment (T6), and 12-month assessment (T12).

Edelstein, 2004; Watson et al., 2002]. There is a caution that among the variables that we studied, BSI.GSI symptoms and PSS are most sensitive scales to change with time, and therefore most likely to show changes with treatment (Table 2). In addition, concepts of mastery and self-esteem could be interpreted by individuals as inconsistent with ideas of surrender to a deity, because of issues related to self-sufficiency, pride, and self-control. This could problematic for people with strong religious faith, and could partly explain the negative repeated measures ANOVA results for the MS and RSE scales [Table 2; Watson et al., 1985].

The results of this study should be viewed in the light of several methodological limitations. The small sample size increases the chance of a Type II error, but in the hierarchical regression analysis we were able to control for age, sex, and lifetime presence of hypomanic symptoms. Data on medication use were not collected. Because we did not include a no-treatment control group, we do not know whether improvement was due to treatment or personal resources of the participants. The treatment in the program was not standard for all subjects, and the criterion for discharge from the program was subjective.

The use of the four-choice score in the responses to the BSI means that the scores on the BSI.GSI cannot be directly compared with scores from other populations. We did have BSI.GSI scores available from a separate sample of the local general population, and calculated a Clinically Significant Change of 71.4% and Reliable Change Index of 48.2% for the total group of 56 subjects, indicating that the improvement was clinically meaningful [Bowen and D'Arcy, 2003; Jacobsen et al., 1988]. The single general question on religion does not capture important heterogeneity in practices and beliefs, and is more likely to be unreliable than a more comprehensive measurement instrument [Pargament, 2002; Schnittker, 2001]. We did, however, find high test–retest reliability between time T0 and T12 ratings of IR (Spearman $\rho = .61$, $P < .000$), and the percentage of subjects in the four IR levels were similar to the percentages in the Canadian national population. We were also unable to explore the nature, duration, or severity of stress for the participants. It would seem reasonable to presume that untreated PD that is frequently accompanied by fears of dying is a severe, ongoing, uncontrollable source of stress [Pargament, 2002].

Advantages of the method are that the data were collected to explore social parameters that determine outcome in psychiatric patients, and neither the researchers nor participants were aware at the time that this particular hypothesis would be tested. The data were collected by self-report, but interviewers were present to answer questions and clarify ambiguities. The interviewer who did the diagnostic assessment and collected the first self-report data was different from the interviewers who collected the second and third sets of data, further decreasing the possibilities of bias.

CONCLUSIONS

Self-rated IR (salience) was found to be an important predictor of improved outcome in symptoms of patients with PD 1 year after treatment. Subjects who rated religion as *very important* improved significantly more on BSI.GSI global symptoms, anxiety/phobia symptoms, and perceived stress than the rest of the patients. This study needs to be replicated, and the results suggest that it would be useful to include measures of religion and spirituality in treatment outcome studies of panic and anxiety [Shreve-Neiger and Edelstein, 2004].

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