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Psychometric evaluation of the Snaith–Hamilton Pleasure Scale (SHAPS) in adult outpatients with major depressive disorder

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Abstract

The inability to experience pleasure, anhedonia, is recognized as a hallmark symptom of depression. An instrument developed for the assessment of hedonic capacity is the 14-item, self-report, Snaith–Hamilton Pleasure Scale, but its psychometric properties have not been adequately evaluated. The current study examined the reliability and validity of the SHAPS using a large sample of adult outpatients with major depressive disorder (MDD). Data for the current study were obtained from 461 adult outpatients with a diagnosis of MDD who participated in Project IMPACTS. Internal consistency of the SHAPS was assessed using Cronbach's coefficient alpha. A Principal Factor Analysis was used to define the dimensionality of the SHAPS. Convergent and discriminant validity was assessed by evaluating the Pearson correlations between the SHAPS total score and the pleasure/enjoyment item of the IDS-C₃₀, QLES-Q, HRSD₁₇, IDS-C₃₀, QIDS-C₁₆, and MADRS₁₀, respectively. The internal consistency of the SHAPS was .91. A one-factor solution emerged for the SHAPS (eigenvalues of the first two initial factors were 5.95 and 0.43, respectively). Pearson correlations revealed a positive linear relationship between the SHAPS total score and the total scores on the HRSD₁₇ ($r = .49, p < .0001$), IDS-C₃₀ ($r = .56, p < .0001$), QIDS-C₁₆ ($r = .55, p < .0001$), and MADRS₁₀ ($r = .53, p < .0001$). The SHAPS total score was negatively correlated with the QLES-Q ($r = -0.65, p < .0001$). The current study shows that the SHAPS is a reliable, valid, and unidimensional instrument to assess hedonic capacity in adult outpatients with MDD.

Keywords

Major depression; hedonic capacity; Snaith-Hamilton pleasure scale; reliability and validity

Introduction

Anhedonia, the inability to experience pleasure, is recognized as a hallmark symptom of depression, and is included as a primary symptom in the diagnostic criteria for clinical depression in both the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM IV; APA, 2000) and the International Statistical Classification of Diseases and Related

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Health Problems (ICD; WHO, 1992). Although low hedonic capacity or anhedonia is considered a core symptom in the psychopathology of major depressive disorder, its measurement in depression has received little research attention. In fact, measures of hedonic capacity have been excluded from most studies in favor of multiple measures of depression severity. An instrument developed for the assessment of hedonic capacity is the 14-item, self-report, Snaith–Hamilton Pleasure Scale (SHAPS; Snaith et al., 1995). The SHAPS was developed to minimize cultural, gender, and age biases in the evaluation of hedonic capacity (Snaith et al., 1995), and has potential for use in both clinical and research settings, but the validity and reliability of the SHAPS have not been adequately established in MDD patients. The three validation studies to our knowledge that examined the psychometric properties of the SHAPS in a clinical setting used the French (Loas et al., 1997), German (Franz et al., 1998), or Dutch (Franken et al., 2007) version of the SHAPS and used small clinical samples of MDD or schizophrenic inpatients (sample sizes ranged from 20 to 103 inpatients). And there have been no studies (to our knowledge) that have assessed the psychometric properties of the SHAPS (English or foreign versions) in adult outpatients with major depressive disorder.

The purpose of the current study was to examine the psychometric properties of the original (English) version of the SHAPS (Snaith et al., 1995) using a large generalizable sample of 461 adult outpatients with MDD. Using classical test theory analysis, we examined the internal consistency, scale dimensionality, and convergent and discriminant validity of the SHAPS. Also, in this study, we examined the relationship of the SHAPS scores with participant demographic and clinical characteristics.

Methods

Study and Participants

Data were obtained from Project IMPACTS (Implementation of Algorithms using Computerized Treatment Systems). The procedures and methods of Project IMPACTS have been detailed elsewhere (Trivedi et al., 2007). Briefly, Project IMPACTS examined the effectiveness of a computer-based decision support system for algorithm-based treatment of major depressive disorder across four domains: patient outcomes, direct cost of treatment, impact on physicians' behavior and attitudes, and overall health care cost versus outcome (Trivedi et al., 2007). The IMPACTS patient outcome data (study exit or the date closest to one year), which include symptom severity, hedonic capacity, social and work function, and quality of life, were used in the current paper. Patients with no postbaseline data were excluded. Participants for the current study were 461 adult outpatients (18 years of age and older) with a diagnosis of MDD (with or without psychotic symptoms), as verified by the Structured Clinical Interview for DSM-IV (SCID) (First et al., 1995) and a 17-item Hamilton Rating Scale for Depression (HRSD₁₇) score of 14 or greater (Hamilton, 1960) that were treated by a study-enrolled clinician.

Measures

The current study used four separate clinician-rated instruments to measure depressive severity, a self-administered instrument to measure hedonic capacity, and a self-administered instrument to measure quality of life, enjoyment, and satisfaction. The clinician raters of depressive severity were blinded to treatment assignment.

Measure of Hedonic Capacity—The 14-item Snaith–Hamilton Pleasure Scale (SHAPS; Snaith, 1993). The SHAPS is a self-administered instrument that was used to measure hedonic capacity (Snaith, 1993). The SHAPS items are displayed in Table 1. Each of the items has a set of four response categories--Definitely Agree, Agree, Disagree, and Strongly Disagree, with either of the Disagree responses receiving a score of 1 and either of the Agree responses

receiving a score of 0. Thus, the SHAPS was scored as the sum of the 14 items so that total scores ranged from 0 to 14. A higher total SHAPS score indicated higher levels of present state of anhedonia.

Measure of Quality of Life, Enjoyment, and Satisfaction—Quality of Life, Enjoyment, and Satisfaction Questionnaire (QLES-Q short form; Endicott et al., 1993). The QLES-Q Short Form is a 16-item self-administered questionnaire designed to measure degree of enjoyment and satisfaction in general activities. The QLES-Q measured each of the items using a 5-point Likert-type scale. The QLES-Q was first scored as the sum of the first 14 items so that total scores ranged from 14 to 70 and then the sum was converted into a percentage of the maximum possible score. Higher QLES-Q scores reflected greater enjoyment and satisfaction with activities. The QLES-Q has previously been found to have acceptable reliability and validity (Endicott, 1993).

Measures of Depression Severity—The 17-item Hamilton Rating Scale for Depression (HRSD₁₇; Hamilton, 1960). The HRSD₁₇ is a widely used clinician-administered rating scale that is designed to assess symptom severity in patients diagnosed with depression (Schwab et al., 1967). Total score on the HRSD₁₇ ranges from 0 to 52, with higher scores representing greater severity of depressive symptoms. The HRSD₁₇ has established psychometric properties (Hamilton, 1960; Schwab et al., 1967).

The 16-item Quick Inventory of Depressive Symptomatology (QIDS-C₁₆; Rush et al., 2003; Trivedi et al., 2004). The QIDS-C₁₆, the clinician-administered version, assesses the nine symptom domains which constitute the DSM-IV criteria for depression: sad mood, lack of interest, feelings of guilt, suicidal ideation, decreased energy, sleep disturbance, appetite/weight increase/decrease, and psychomotor agitation/retardation. Total score on the QIDS-C₁₆ ranges from 0 to 27, with higher scores representing greater severity of depressive symptoms. The psychometric properties of the QIDS-C₁₆ have been extensively evaluated (Rush et al., 2003, 1996; Trivedi et al., 2004).

The 30-item Inventory of Depressive Symptomatology – Clinician-rating (IDS-C₃₀; Rush et al., 1996; Trivedi et al., 2004). The IDS-C₃₀ includes the 16 items contained on the QIDS-C₁₆, as well as 14 additional items designed to assess melancholic, atypical, and anxious features. Total score on the IDS-C₃₀ ranges from 0 to 84, with higher scores representing greater severity of depressive symptoms. The pleasure/enjoyment item of IDS-C₃₀ (item 21) was also used to evaluate convergent validity of the SHAPS. The pleasure/enjoyment item of the IDS-C₃₀ was scored using a 4-point scale that ranged from 0 (derives usual sense of enjoyment from pleasurable activities) to 3 (unable to register any sense of pleasure/enjoyment from anything). The psychometric properties of the IDS-C₃₀ have been previously evaluated (Rush et al., 2003, 1996; Trivedi et al., 2004).

The 10-item clinician-rated Montgomery-Asberg Depression Rating Scale (MADRS₁₀; Montgomery and Åsberg, 1979). The MADRS₁₀ is one of the most widely used clinician-rated assessments of depressive severity, with well-established psychometric properties (Khan et al., 2002; Galinowski and Lehert, 1995). Total score on the MADRS₁₀ ranges from 0 to 60, with higher scores representing greater severity of depressive symptoms.

Statistical Analysis

The Pearson/point-biserial partial correlation coefficient (controlling for QIDS-C₁₆ at exit) was used to assess the linear relationship between SHAPS total score (at exit) and participant demographic and clinical characteristics. For the point-biserial correlation analysis, gender, race, and first versus recurrent episode of depression were binary indicators; gender coded as

male = 0 and female = 1, race coded as Caucasian = 0 and non-Caucasian = 1, and first versus recurrent episode of depression coded as first = 0 and recurrent = 1.

Classical test theory (CTT) analysis was used to generate the mean, standard deviation, and item/total correlation (r_{it}) for each SHAPS item as well as the overall scale mean and scale standard deviation. CTT analysis also evaluated the internal consistency of the SHAPS using Cronbach's coefficient alpha (α).

A Principal Factor Analysis, with Promax rotation, was used to define the dimensionality of the SHAPS and to interpret the proportion of explained variance. The prior communality estimates for each SHAPS item was set to its squared multiple correlation with all other SHAPS items. To interpret a unidimensional scale, the eigenvalue of the first principal factor should exceed one (using the Kaiser-Guttman criterion), but the reverse should be the case of all subsequent eigenvalues.

Convergent and discriminant validity was assessed by evaluating the Pearson correlations between the SHAPS total score and the pleasure/enjoyment item of the IDS-C₃₀ (sub-item 21), QLES-Q, HRSD₁₇, IDS-C₃₀, QIDS-C₁₆, and MADRS₁₀, respectively. Further, the one-way Analysis of Variance (ANOVA) was used to examine, on the SHAPS total score, those who were "severely-to-very severely depressed" (≥ 37 IDS-C₃₀ total score) versus those who were "mild-to-moderately depressed" (≤ 36 IDS-C₃₀ total score). Also, the pleasure/enjoyment item of the IDS-C₃₀ (sub-item 21) was categorized into three groups (those who scored 0 vs. 1 vs. 2 or 3) and then the one-way ANOVA was used to evaluate the relationship between the three groups of the IDS-C₃₀ sub-item 21 and the SHAPS total score. The Ryan-Einot-Gabriel-Welsch Multiple Range Test (which controls the Type I experimentwise error rate) was used to examine the pairwise comparisons among the three groups of the IDS-C₃₀ sub-item 21.

All analyses were carried out using SAS 9.2 (SAS Institute, Inc., Cary, NC). The level of significance for all tests was set at $\alpha = .05$ (two-tailed).

Results

Participant Characteristics

The study sample included 75 males (16.3%) and 386 females (83.7%), with an average age of 50.2 years (SD=10.6; age range: 19-80 years). Participants included 282 (61.2 %) Caucasians, 141 (30.6 %) African-Americans, 20 (4.3%) Hispanics, and 18 (3.9%) other (not specified). Approximately 15% of the participants were in their first episode of depression. The average length of illness was 29.5 years (SD=14.4), and the average duration of the current depressive episode was 9.3 years (SD=11.9). Participant demographic and clinical characteristics (baseline and exit) are reported in Table 2.

SHAPS and Participant Characteristics

The Pearson partial correlations (controlling for QIDS-C₁₆ at exit) revealed no significant relationship between SHAPS total score at exit and age ($r = -0.07, p < .19$), education ($r = -0.05, p < .33$), duration of the current depressive episode ($r = -0.05, p < .32$), and length of illness ($r = 0.04, p < .40$). The point-biserial partial correlations (controlling for QIDS-C₁₆ at exit) also revealed no significant relationship between SHAPS total score at exit and gender ($r_{pb} = -0.06, p < .23$), race ($r_{pb} = -0.06, p < .24$), and first versus recurrent episode of depression ($r_{pb} = 0.08, p < .11$). The results are reported in Table 3.

Internal Consistency and Scale Dimensionality

The internal consistency (Cronbach's coefficient alpha) of the SHAPS was .91. The mean item-total correlation was .61 (ranging from .49 to .72). Table 1 summarizes the classical test theory results for the SHAPS. Cronbach's coefficient alpha for each of the depression scales (at exit) used in the current study was as follows: HRSD₁₇ ($\alpha = .78$), IDS-C₃₀ ($\alpha = .86$), QIDS-C₁₆ ($\alpha = .79$), and MADRS₁₀ ($\alpha = .86$).

A Principal Factor Analysis, with Promax rotation, yielded a one-factor solution for the SHAPS (eigenvalues of the first two initial factors were 5.95 and 0.43, respectively). All items loaded reasonably high ($> .45$) on the first principal factor, which explained 36.6% of the total variance.

Convergent and Discriminant Validity

When the pleasure/enjoyment item of the IDS-C₃₀ (sub-item 21) was categorized into three groups (those who scored 0 vs. 1 vs. 2 or 3), the one-way ANOVA revealed a significant between-subjects effect (3 groups of IDS-C₃₀ sub-item 21) on the SHAPS total score ($F = 41.59$, $df = 2, 363$, $r = 0.48$, $p < .0001$). The means for SHAPS total scores were lower for those who scored "zero" on IDS-C₃₀ sub-item 21 ("derives usual sense of enjoyment from pleasurable activities," $M = 1.98$, $SD = 3.01$) than those who scored "one" on IDS-C₃₀ sub-item 21 ("does not feel usual enjoyment from pleasurable activities," $M = 2.87$, $SD = 3.51$) or those who scored "two or three" on IDS-C₃₀ sub-item 21 ("rarely derives pleasure from any activities" or "unable to register any sense of pleasure/enjoyment from anything," $M = 5.96$, $SD = 4.46$). Multiple comparisons of the three coded IDS-C₃₀ sub-item 21 groups on the SHAPS total score indicated a significant difference between those who scored "two or three" and those who scored "one" ($p < .0002$) and between those who scored "two or three" and those who scored "zero" ($p < .0002$), but no difference between those who scored "zero" and those who scored "one" ($p < .07$). Further, the SHAPS total score was negatively correlated with the QLES-Q ($r = -0.65$, $p < .0001$).

The Pearson correlations revealed a positive linear relationship between the SHAPS total score and the total scores on the HRSD₁₇ ($r = .49$, $p < .0001$), IDS-C₃₀ ($r = .56$, $p < .0001$), QIDS-C₁₆ ($r = .55$, $p < .0001$), and MADRS₁₀ ($r = .53$, $p < .0001$). The direction and magnitude of these correlation coefficients suggests that persons with greater levels of depression severity had relatively higher levels of anhedonia. Indeed, patients at exit who were "severely-to-very severely depressed" (≥ 37 IDS-C₃₀ total score) had significantly higher mean SHAPS total scores (higher levels of anhedonia) than those who were "mild-to-moderately depressed" (≤ 36 IDS-C₃₀ total score), $M = 6.65$ ($SD = 4.07$) versus $M = 2.34$ ($SD = 3.41$), $t = 9.36$, $p < .0001$, $R^2 = .22$, $r = .46$. Correlations between the SHAPS and the other measures are displayed in Table 3.

Discussion

The current study examined the reliability and validity of the SHAPS in a large sample of 461 adult outpatients with MDD. The internal consistency of the SHAPS in this depressed outpatient sample is excellent ($\alpha = 0.91$) and is in line with previous findings in depressed and schizophrenic inpatients (e.g., Franken et al., 2007; Franz et al., 1998; Loas et al., 1997) and in depressed and non-depressed patients diagnosed with Parkinson's disease (Lemke et al., 2006). The Principal Factor Analysis indicates that the SHAPS is unidimensional, suggesting that it is limited mainly to the trait of hedonic capacity, which also accords with previous findings (Franken et al., 2007; Lemke et al., 2006; Leventhal et al., 2006). Together with results from the few existing studies, the SHAPS (English and foreign versions) seems to have substantial internal consistency and is unidimensional in the assessment of hedonic capacity

in both patient (Franken et al., 2007; Franz et al., 1998; Lemke et al., 2006; Loas et al., 1997) and non-patient volunteer populations (Leventhal et al., 2006).

Convergent and discriminant validity were assessed by evaluating the relationship between the SHAPS total score and four separate measures of depression severity, the pleasure/enjoyment item of the IDS-C₃₀ (sub-item 21), and a measure of Quality of Life, Enjoyment, and Satisfaction. The pattern of the SHAPS mean scores is consistent with the scoring direction on the pleasure/enjoyment item of the IDS-C₃₀ (sub-item 21); that is, those who rarely or are unable to derive pleasure from activities (as coded/scored on IDS-C₃₀ sub-item 21) also have higher levels of anhedonia or lower levels of hedonic capacity (as measured via the SHAPS). The SHAPS also correlated negatively with the QLES-Q, indicating that persons with lower levels of enjoyment and satisfaction with activities (as measured by the QLES-Q) have higher levels of anhedonia (or lower levels of hedonic capacity as measured by the SHAPS). The magnitude of the correlation between the SHAPS total score and each of the other four measures of depression is modest--and in line with previous findings that also report a modest correlation with the Beck Depression Inventory (Franken et al., 2007; Leventhal et al., 2006), HRSD (Franz et al., 1998), and MADRS (Mazzaa et al., 2009)--suggesting that hedonic capacity (as measured by the SHAPS) may tap a related but distinct construct from depression. The SHAPS is also able to discriminate between outpatients who were severely-to-very severely depressed and those who were mild-to-moderately depressed. The results of the current study in an outpatient sample of adult patients with MDD and those from previous findings (e.g., Franken et al., 2007; Franz et al., 1998; Loas et al., 1997; Leventhal et al., 2006; Mazzaa et al., 2009) suggest that the SHAPS has adequate construct validity.

Finally, in this study, we examined the relationship of the SHAPS with participant demographic and clinical characteristics. The SHAPS was not influenced by age, gender, race, education, duration of the current depressive episode, length of illness, or first versus recurrent episode of depression. This basic finding is consistent with the Franken et al. (2007) study and is in line with the supposition that the SHAPS was developed to minimize cultural, gender, and age biases in the evaluation of hedonic capacity (Snaith et al., 1995).

The current study may be tempered by a few limitations. The study evaluated the self-report SHAPS against clinician-rated measures of depression severity; it would have been preferable to validate the SHAPS against self-report measures of depression (but self-report measures of depression were not collected in the Project IMPACTS study). Also, because the evaluation of convergent validity of the SHAPS in the current study was limited in scope, the inclusion of a more comprehensive anhedonia scale or sub-scale would have strengthened the assessment of convergent validity of the SHAPS.

Despite these limitations, the current study has strengths, including a large sample of 461 adult outpatients with major depressive disorder. Further, the participants in the current study are typical outpatients with major depressive disorder who reside in the community, United States public mental health setting. The use of outpatients from the public health care system, thus, provides a greater degree of generalizability of our findings.

Conclusion

In conclusion, this is the first study to our knowledge to show that the original (English) version of the SHAPS (Snaith et al., 1995) has excellent internal consistency, with construct validity, and is unidimensional in assessing hedonic capacity among adult outpatients with major depressive disorder. The SHAPS possesses excellent psychometric properties, was not influenced by participant demographic and clinical characteristics, and appears appropriate for use in both clinical and research settings.

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Domain means, item/total correlations, scale internal consistency (α), scale mean, and scale standard deviation for the SHAPS-items at Exit (n = 374)

Table 1

Domain	Mean	SD	r_{it}
1. I would enjoy my favorite television or radio program	0.232	0.423	0.589
2. I would enjoy being with family or close friends	0.241	0.428	0.594
3. I would find pleasure in my hobbies and pastimes	0.371	0.483	0.671
4. I would be able to enjoy my favorite meal	0.256	0.437	0.629
5. I would enjoy a warm bath or refreshing shower	0.163	0.369	0.499
6. I would find pleasure in the scent of flowers or the smell of a fresh sea breeze or freshly baked bread	0.219	0.414	0.645
7. I would enjoy seeing other people's smiling faces	0.237	0.426	0.684
8. I would enjoy looking smart when I have made an effort with my appearance	0.251	0.434	0.595
9. I would enjoy reading a book, magazine or newspaper	0.374	0.484	0.527
10. I would enjoy a cup of tea or coffee or my favorite drink	0.163	0.369	0.576
11. I would find pleasure in small things; e.g., bright sunny day, a telephone call from a friend	0.270	0.444	0.724
12. I would be able to enjoy a beautiful landscape or view	0.246	0.431	0.713
13. I would get pleasure from helping others	0.163	0.369	0.586
14. I would feel pleasure when I receive praise from other people	0.286	0.452	0.577
Cronbach's Coefficient α	0.909		
Scale Mean	3.471		
Scale Standard Deviation	5.963		
Mean Item-Total Correlation	0.614		

Table 2

Participant Characteristics

Participant Characteristic	Patient Sample (N = 461)
Demographics	
Age in years, M (SD)	50.2 (10.6)
Education in years, M (SD)	12.5 (2.6)
Race, N (%)	
Caucasian	282 (61.2)
African American	141 (30.6)
Hispanic	20 (4.3)
Other (not specified)	18 (3.9)
Gender, N (%)	
Female	386 (83.7)
Male	75 (16.3)
Marital Status: Married, N (%)	112 (24.3)
Employment Status: Employed, N (%)	27 (5.9)
Clinical Characteristics	
Psychotic Features, N (%)	104 (22.5)
Anxiety, N (%)	257 (55.7)
Substance Use, N (%)	195 (42.2)
Number of GMCs, M (SD)	12.4 (6.8)
First MDD Episode, N (%)	71 (15.5)
Current MDD Episode Length in years, M (SD)	9.3 (11.9)
Age of MDD Onset in years, M (SD)	20.8 (13.9)
Length of Illness in years, M (SD)	29.5 (14.4)
SHAPS total at baseline, M (SD)	4.0 (3.3)
SHAPS total at exit, M (SD)	3.4 (4.1)
HRSD ₁₇ total at baseline, M (SD)	21.7 (4.6)
HRSD ₁₇ total at exit, M (SD)	15.5 (6.5)
IDS-C ₃₀ at baseline, M (SD)	37.7 (8.4)
IDS-C ₃₀ at exit, M (SD)	28.2 (12.9)
IDS-C ₃₀ sub-item 21 at baseline, M (SD)	1.1 (0.82)
IDS-C ₃₀ sub-item 21 at exit, M (SD)	0.89 (0.86)
QIDS-C ₁₆ at baseline, M (SD)	15.7 (3.5)
QIDS-C ₁₆ at exit, M (SD)	11.1 (5.2)
MADRS ₁₀ at baseline, M (SD)	27.9 (7.3)
MADRS ₁₀ at exit, M (SD)	19.4 (9.9)
QLES-Q at baseline, M (SD)	48.1 (11.8)
QLES-Q at exit, M (SD)	53.3 (14.7)

Note: M = Mean; SD = Standard Deviation; N = Sample Size.

IDS-C₃₀ sub-item 21 = the pleasure/enjoyment item of the IDS-C₃₀.

GMC = General Medical Conditions.

Table 3
Pearson correlation coefficients between the SHAPS and various other scales at exit and participant demographic and clinical characteristics

	HRS _{D17}	IDS-C ₃₀	QIDS-C ₁₆	MADRS-C ₁₀	IDS-C 21	QLES-Q	Age	Gender	Race	Education	First/Recurrent Episode	Current Episode Length	Length of Illness
SHAPS Total	0.49	0.56	0.55	0.53	0.48	-0.65	-0.07 ^a	-0.06 ^a	-0.06 ^a	-0.05 ^a	0.08 ^a	-0.05 ^a	0.04 ^a
(p value)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.19)	(<.23)	(<.24)	(<.33)	(<.11)	(<.32)	(<.40)

Note. For the point-biserial correlation analysis, gender, race, and first versus recurrent episode of depression were binary indicators; gender coded as male = 0 and female = 1, race coded as Caucasian = 0 and non-Caucasian = 1, and first versus recurrent episode of depression coded as first = 0 and recurrent = 1. IDS-C 21 = the pleasure/enjoyment item of the IDS-C30 (sub-item 21).

^a Correlation coefficient adjusted for QIDS-C16 at exit.