

# 10-year course of social adjustment in major depression

International Journal of  
Social Psychiatry  
57(5) 501–508  
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sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/0020764010371273  
isp.sagepub.com



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## Abstract

**Background:** It is now widely acknowledged that depression is accompanied by major deficits in social functioning. However, the course of this dysfunction and its relationship with depressive symptoms in the long term is less understood.

**Methods:** The Group for Longitudinal Affective Disorders Study (GLADS) in Japan has conducted a 10-year prospective, serial follow-up of a cohort of mood disorder patients starting treatment for their index episode. The vicissitudes of the social adjustment of patients with major depression were analyzed using the standardized instrument (Social Adjustment Scale – Self-Report) and in conjunction with the measurement of depressive severity (Centre for Epidemiologic Studies Depression).

**Results:** The results showed: (i) psychiatric patients with major depression commencing treatment showed moderate to extremely large social dysfunction at baseline; (ii) this dysfunction declined rapidly in the first six months of treatment but then levelled off and showed fluctuating patterns up to 10 years of follow-up; (iii) the degree of dysfunction varied from domain to domain, most notable in Work and least notable in Economy subscales; and (iv) the influence of persistent depression also varied from domain to domain, stronger in Housework and Leisure and weakest in Work spheres.

**Conclusion:** Future studies of social functioning in depression need to differentiate its various aspects.

## Keywords

major depression, social functioning, social adjustment

## Introduction

Numerous cross-sectional studies have repeatedly found that depression is associated with substantial social dysfunction. In a classical study, Weissman et al. (1971) showed that acutely depressed women were significantly more impaired in major social roles such as work, family and community participation, in comparison with their non-depressed neighbours. The limitations in social functioning attributable to depressive symptoms was comparable with or often worse than that attributed to a major chronic medical condition such as diabetes and arthritis (Wells et al., 1989).

In addition, several subsequent studies have found that this dysfunction is persistent. Paykel and Weissman (1973) followed up Weissman et al.'s cohort up to eight months and found that, overall, social adjustment improved considerably but only more slowly than symptoms. The authors postulated that these residual malfunctions reflected underlying personality disturbances rather than symptoms due to depression *per se*. Similarly, the limitations in functioning and well-being found among depressed primary care patients improved somewhat over the course of two years of follow-up but remained similar to or worse than those associated with chronic medical conditions (Hays et al., 1995). When patients with major depression were compared with relatives without

lifetime psychiatric history in the NIMH Collaborative Depression Study (CDS), they were significantly more likely to report declines in job status and income during the six-year follow-up; surprisingly, even those with sustained recovery throughout the two years of follow-up showed severe and widespread impairment (Coryell et al., 1993).

There are some conflicting reports as well, however. Among primary care patients with depression, moderate social disability was found at baseline but returned to normal levels at follow-up when depression itself had recovered (Ormel et al., 1993). In a two-year follow-up of probands with major depression, it has formerly been reported that social

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function showed continuous amelioration from baseline to symptomatic remission, from remission to symptomatic recovery, and after sustained recovery (Furukawa et al., 2001). When Weissman et al.'s cohort was further followed up four years later, there was little significant difference in social adjustment between the recovered subjects and the normal sample (Bothwell and Weissman, 1977).

These apparent discrepancies may be due to several factors. First, some studies measured social maladjustment in a limited number of aspects only (Coryell et al., 1993) or used a single index (Zimmerman et al., 2007). Second, the relationship between depression and social adjustment may depend on the clinical setting, such that they may not be the same among primary care patients (Hays et al., 1995; Ormel et al., 1993), among psychiatric patients (Furukawa et al., 2001; Weissman et al., 1971) and in tertiary care academic centres (Coryell et al., 1993; Judd et al., 2000). The studies also differed substantially in the length and depth of the follow-up. Some followed up their cohort for only a few years (Hays et al., 1995; Ormel et al., 1993; Paykel and Weissman, 1973), while others did so for up to 15 years, but only reported the global average through their follow-up (Judd et al., 2000, 2008).

The Group for Affective Disorders Study (GLADS) in Japan has been conducting a prospective, serial follow-up of mood disorder patients since the mid-1990s and has recently completed its 10-year follow-up (Furukawa et al., 2000a, 2009). This report examines the 10-year course of social adjustment of patients with major depression, paying due attention to differential aspects of social functions as measured with a standardized instrument and in relation to the depressive symptoms assessed concurrently.

## Methods

### Subjects

The cohort consisted of 44 patients with major depression, either single episode or recurrent, starting treatment for their index episode at one of the five participating centres of GLADS in Japan. The five centres consisted of three university-affiliated general hospitals, one general hospital and one psychiatric hospital.

The participants' diagnoses were made by experienced psychiatrists upon entry into the study by use of a structured psychiatric interview, the Comprehensive Assessment List of Affective disorders (COALA), for which good to excellent reliability has been confirmed (Furukawa et al., 1995). In addition to a serial assessment with the structured interviews, the subjects were administered the Social Adjustment Scale – Self-Report (SAS-SR) (Suzuki et al., 2003; Weissman and Bothwell, 1976) as well as the Centre for Epidemiologic Studies Depression Scale (CES-D) (Furukawa et al., 1997; Radloff, 1977) at baseline, monthly up to the treatment termination, six-monthly thereafter up to two years, and yearly thereafter up to 10 years of follow-up. The details of the

recruitment and follow-up procedures of GLADS have been reported elsewhere (Furukawa et al., 2000a). All the participants gave their written informed consent to the study after full explanation of its purposes and procedures.

### SAS-SR

The SAS-SR is a 42-item self-report questionnaire that measures affective or instrumental performance over the previous two weeks in seven major areas of social functioning: work (as a worker, housewife or student); social and leisure activities; relationship with extended family; marital role as a spouse; parental role; membership in the family unit; and economic adequacy (Weissman and Bothwell, 1976; Weissman et al., 1978). It was originally an interviewer-based scale, derived from the then much-used Structured and Scaled Interview to Assess Maladjustment (SSIAM) (Gurland et al., 1972a, 1972b) but it was soon converted into a self-report format because the latter is simpler to administer and less expensive. The SAS-SR scores are highly correlated with those obtained with the interview form of the scale (Weissman and Bothwell, 1976). The SAS-SR remains one of the most often used instruments in the area of social adjustment (Bech, 2005; Goldman et al., 1992).

The Japanese version of the SAS-SR was published in 1986 (Nakao and Kitamura, 1986). Adequate reliability, validity and interpretability have been reported (Suzuki et al., 2003).

### CES-D

The CES-D is a 20-item self-report scale which assesses the frequency/duration of cognitive, affective, behavioral and interpersonal symptoms associated with depression. It was originally developed to measure and detect depressive symptomatology in the community (Radloff, 1977) but has since been employed extensively in studies with psychiatric populations (Radloff and Locke, 2008). It has been translated into several languages including Japanese (Shima et al., 1985).

A cut-off score of 16/15 has traditionally been used to distinguish individuals considered to be depressed from those classified as non-depressed (Radloff and Locke, 2008). This standard cut-off has been confirmed in a Japanese study (Furukawa et al., 1997; Shima et al., 1985).

### Treatment received

This was a naturalistic study and the treatment was not controlled but was recorded.

Upon commencement of the treatment, all the patients but one received some medication, and over 80% of them received some antidepressant at the mean dosage of 60 mg/d of imipramine equivalent (Furukawa et al., 2000b). The dosage was increased to 85 mg/d of imipramine equivalent within four weeks. The dosage might be suboptimal but can be considered to be within an effective range (Furukawa et al., 2003).

However, only 38% of the responding patients were kept on some medication during the six months after symptoms abated; after that the proportion was even smaller (Fujita et al., 2008).

**Statistical analyses**

The primary objective of this study was to describe the course of social adjustment among patients receiving care as usual in Japan over 10 years. A descriptive summary of the total and subscale SAS-SR scores of the cohort over the 10 years of follow-up was obtained and were standardized by using normative data for the general population in Japan, as reported in the literature (Suzuki et al., 2003).

The secondary aim was to examine if the level of social adjustment of the cohort was influenced by the level of depression of the subjects. To this end, the SAS-SR scores were compared between those who scored below the cut-off of the CES-D and those who scored above by way of Mann-Whitney *U*-test. In order to guard against false positives due to multiple comparisons, the threshold of statistical significance was taken as 0.01.

**Results**

**Subjects and their follow-up**

The socio-demographic and clinical characteristics of the cohort at baseline were summarized (Table 1).

**Table 1.** Socio-demographic and clinical characteristics of the cohort (*n* = 44) at baseline

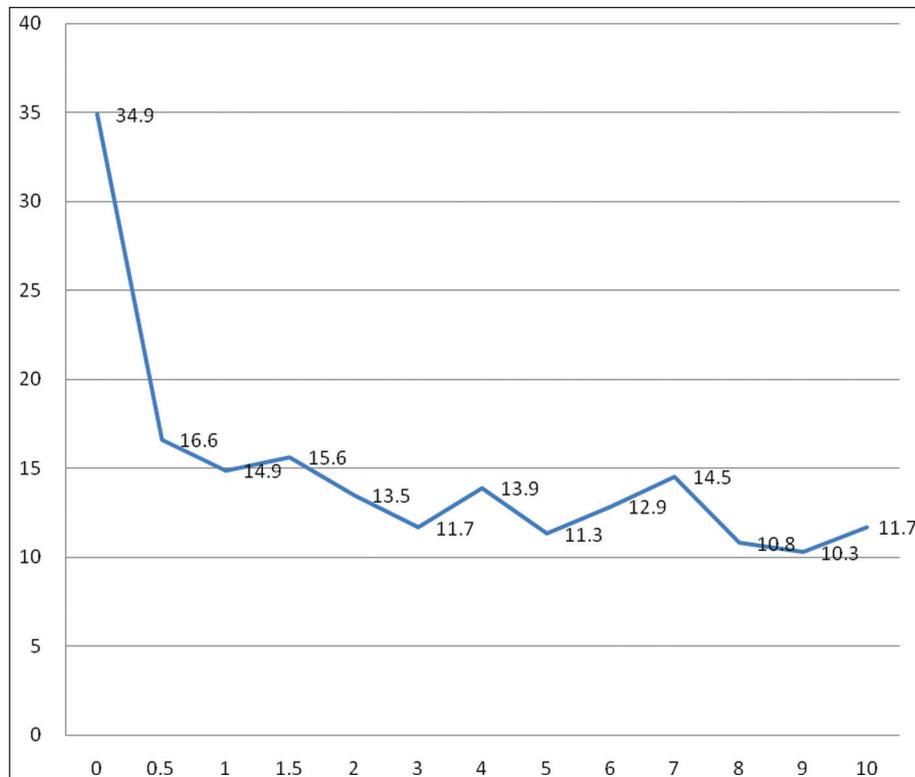
<b>Gender</b>	28 women (64%)
<b>Age (mean, SD)</b>	41.7 (SD = 16.6)
<b>Diagnosis</b>	Major depression, single episode ( <i>n</i> = 30) and recurrent ( <i>n</i> = 14)
<b>Comorbidities</b>	Dysthymic disorder ( <i>n</i> = 5) Panic disorder with or without agoraphobia ( <i>n</i> = 3) Social phobia ( <i>n</i> = 1) Generalized anxiety disorder ( <i>n</i> = 1) Anorexia nervosa ( <i>n</i> = 1)
<b>Depression severity</b>	CES-D 34.9 (SD = 10.5)

Of the 44\*13 = 572 follow-up points, it was possible to collect information at 398 time points (69.6%). In the course of the 10-year follow-up, three died natural deaths, 15 either refused contact or became uncontactable, and 26 of the original 44 (59.0%) were available for the follow-up assessments.

The CES-D scores dropped substantially in the first six months, then showed slow, gradual and fluctuating decline until the point of assessment (Figure 1).

**SAS-SR scores across 10 years**

The changes in the SAS-SR total and subscale raw scores of the cohort over their 10-year naturalistic follow-up were recorded (Table 2).



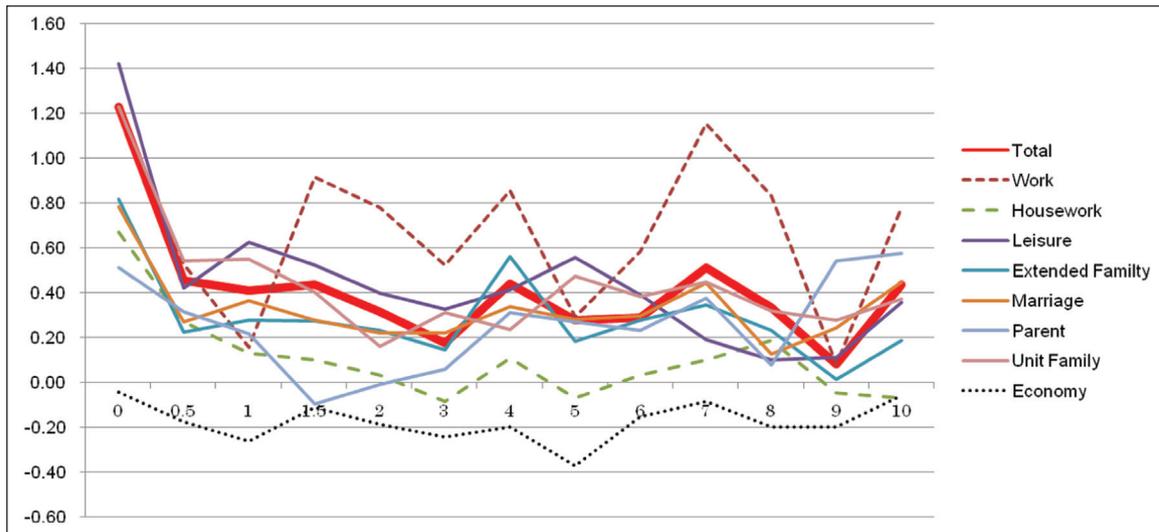
**Figure 1.** CES-D scores during the 10-year naturalistic follow-up

Table 2 SAS-SR total and subscale raw scores during the 10-year naturalistic follow-up

	Baseline (n = 44)	6 months (n = 33)	12 months (n = 35)	18 months (n = 29)	24 months (n = 33)	3 years (n = 31)	4 years (n = 31)	5 years (n = 30)	6 years (n = 33)	7 years (n = 25)	8 years (n = 24)	9 years (n = 24)	10 years (n = 26)
<b>Total</b>	2.36 (0.53)	1.93 (0.39)	1.91 (0.40)	1.92 (0.37)	1.86 (0.58)	1.78 (0.29)	1.92 (0.42)	1.83 (0.36)	1.84 (0.34)	1.96 (0.42)	1.86 (0.39)	1.73 (0.34)	1.92 (0.48)
<b>Work</b>	2.95 (1.30)	2.19 (1.39)	1.80 (.83)	2.61 (1.61)	2.47 (1.60)	2.19 (1.21)	2.55 (1.49)	1.94 (1.11)	2.26 (1.32)	2.87 (1.64)	2.52 (1.51)	1.72 (0.40)	2.47 (1.56)
<b>House- work</b>	2.29 (0.61)	1.89 (0.54)	1.75 (0.48)	1.72 (0.45)	1.65 (0.61)	1.53 (0.42)	1.73 (0.8)	1.55 (0.4)	1.65 (0.44)	1.72 (0.48)	1.81 (0.68)	1.57 (0.34)	1.55 (0.44)
<b>Leisure</b>	3.02 (0.75)	2.3 (0.69)	2.44 (0.73)	2.37 (0.67)	2.28 (0.74)	2.23 (0.59)	2.29 (0.68)	2.39 (0.75)	2.28 (0.72)	2.13 (0.47)	2.06 (0.54)	2.07 (0.56)	2.25 (0.53)
<b>Extended Family</b>	1.89 (0.63)	1.48 (0.38)	1.51 (0.46)	1.51 (0.54)	1.48 (0.63)	1.42 (0.5)	1.71 (0.63)	1.45 (0.48)	1.51 (0.43)	1.56 (0.46)	1.48 (0.48)	1.33 (0.36)	1.45 (0.38)
<b>Marriage</b>	2.65 (0.62)	2.25 (0.43)	2.33 (0.44)	2.26 (0.44)	2.22 (0.54)	2.22 (0.37)	2.31 (0.45)	2.26 (0.48)	2.27 (0.47)	2.39 (0.45)	2.14 (0.46)	2.23 (0.43)	2.39 (0.42)
<b>Parent</b>	2.14 (0.77)	1.94 (0.49)	1.84 (0.44)	1.52 (0.37)	1.61 (0.49)	1.68 (0.51)	1.94 (0.47)	1.89 (0.45)	1.85 (0.55)	2.0 (0.71)	1.7 (0.56)	2.17 (0.77)	2.2 (0.71)
<b>Unit Family</b>	2.89 (0.93)	2.08 (0.84)	2.09 (0.85)	1.91 (0.7)	1.63 (0.68)	1.81 (0.8)	1.72 (0.57)	2 (0.78)	1.89 (0.72)	1.97 (0.72)	1.82 (0.82)	1.77 (0.77)	1.88 (0.79)
<b>Economy</b>	1.48 (0.88)	1.35 (0.61)	1.27 (0.45)	1.41 (0.82)	1.34 (0.60)	1.29 (0.53)	1.33 (0.55)	1.17 (0.38)	1.38 (0.66)	1.44 (0.65)	1.33 (0.64)	1.33 (0.64)	1.46 (0.90)
<b>CES-D</b>	34.9 (10.52)	16.61 (11.17)	14.88 (11.64)	15.64 (10.73)	13.47 (10.14)	11.67 (8.87)	13.88 (12.98)	11.32 (8.1)	12.87 (11.53)	14.52 (11.92)	10.79 (8.37)	10.27 (8.77)	11.68 (9.27)

Mean (SD)

Higher scores indicate greater dysfunction on SAS-SR, and greater depression severity on CES-D



**Figure 2.** SAS-SR total and subscale scores, standardized by normative data in the Japanese community sample, during the 10-year naturalistic follow-up

When standardized using the normative data of the Japanese community sample, the vicissitudes of the SAS-SR total and subscale scores becomes more visible (Figure 2). In the case of SAS-SR total score, there was a steep decline in the first six months but then fluctuating patterns for the remainder of the time. All the subscale scores, except for the Economy subscale, appear to follow the pattern of the total score. The Work subscale appears to fluctuate most and to show the greatest disturbance, while the Housework subscale appears to show the least disturbance. However, all of these subscale scores showed steep decline in the first six months but then tended to fluctuate around the effect size of 0.4 on average. On the other hand, the Economy subscale always scored below the effect size of 0, indicating that the patients were financially better off or at least more satisfied than the population average.

### Relationship between SAS-SR and CES-D

The time points at which the SAS-SR total or subscale scores were statistically significantly different between those who scored 16 or more and those who scored less on the CES-D were determined (Table 3).

None of the SAS-SR total or subscale scores showed statistically significant differences between those below and above the caseness threshold on the CES-D at baseline as only two subjects scored less than 16. Thereafter, the total score as well as the Housework, Leisure and Extended Family subscale scores tended to be often dependent on the caseness according to the CES-D, whereas the Work, Marriage, Parent, Unit Family and Economy subscale scores appeared unaffected by the CES-D scores.

In order to enable numerical comparisons, the effect sizes were calculated for the baseline SAS-SR scores and

for the average of 0.5 through to 10 years, and for those scoring below the CES-D threshold at 0.5 through to 10 years (Table 4).

### Discussion

This is the longest study to date to show the longitudinal vicissitudes of various aspects of social adjustment among psychiatric patients with major depression.

First, the patients with major depression starting their treatment often showed large to extremely large social maladjustment at baseline, with effect sizes between 0.5 and 1.4 depending on the domains of social adjustment, because 0.2 corresponds to small effect, 0.5 to moderate effect and 0.8 to large effect, according to the standard interpretation (Cohen, 1988). This maladjustment showed a rapid amelioration in the first six months of treatment but then levelled off only to show fluctuating patterns, corresponding with effect sizes between 0.2 and 0.6 throughout the ensuing 9.5 years.

The Economy subscale was a clear exception to this general trend because it always showed an effect size below 0, indicating that our patients were financially more satisfied than the population average, and because it did not show amelioration through time. It was first hypothesized that this might be due to the preponderance of women in the cohort; women are traditionally not the breadwinners of the family in Japan. However, there was no statistically significant difference between genders in the Economy subscale scores. It is now suspected that this may be due to the well-developed social welfare system in Japan.

The CES-D, measured at the same time as the SAS-SR, suggested that social maladjustment was indeed greater among those with residual depressive symptomatology for

Table 3. SAS-SR total and subscale scores according to caseness on the CES-D

	Baseline	6 months	12 months	18 months	24 months	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
<b>Total</b>	NS	NS	< 0.000	0.001	< 0.001	NS	0.001	0.008	0.001	< 0.001	0.001	< 0.001	0.004
<b>Work</b>	-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
<b>Housework</b>	NS	0.012	0.007	NS	0.009	NS	0.001	0.002	0.001	0.002	0.002	NS	NS
<b>Leisure</b>	NS	0.009	< 0.001	0.009	< 0.001	NS	NS	NS	NS	NS	0.007	NS	NS
<b>Extended Family</b>	NS	NS	0.005	NS	0.001	NS	0.007	NS	NS	NS	0.007	NS	0.006
<b>Marriage</b>	NS	NS	NS	NS	NS	NS	NS	NS	0.001	NS	NS	NS	NS
<b>Parent</b>	-	NS	NS	0.001	NS	NS	NS	0.009	NS	NS	NS	NS	NS
<b>Unit Family</b>	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.003	NS	0.005	0.001
<b>Economy</b>	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.009	NS

NS: not significant

The number of subjects providing total and subscale scores at each time point varied from cell to cell

Table 4. Effect size of SAS-SR scores

	ES at baseline	ES for 0.5 through to 10 years	ES for 0.5 through to 10 years among those with CES-D ≤15
<b>Total</b>	1.22	0.35	0.05
<b>Work</b>	1.23	0.62	0.61
<b>Housework</b>	0.67	0.56	-0.15
<b>Leisure</b>	1.42	0.37	0.10
<b>Extended Family</b>	0.82	0.25	0.02
<b>Marriage</b>	0.78	0.29	0.17
<b>Parent</b>	0.51	0.24	0.05
<b>Unit Family</b>	1.23	0.37	0.20
<b>Economy</b>	-0.05	-0.19	-0.34

the total and Housework and Leisure subscales, but that social maladjustment was largely uninfluenced by the depression level in the case of Marriage, Parent, Unit Family and Economy domains. As a matter of fact, when the effect sizes of SAS-SR subscale scores were averaged separately for those time points where the patients scored below the cut-off of the CES-D, the effect size was close to 0 for the total, Housework and Leisure subscale scores, while that for the Work subscale was moderate to large at 0.61, indicating that our patients resumed normal functioning in the former domains once out of depression but that they could not work normally even when they were not depressed. Such a discrepancy may be due to the rigid job market and traditional lifelong employment system in Japan where a person, once unemployed, can have much difficulty finding a new job even when he/she has recovered from depression. On the other hand, the Housework and Leisure activities, most of which can be performed individually, may be easily brought back to the premorbid level as soon as the depression lifts. The interpersonal functions in the domains of Extended Family, Marriage, Parent or Unit Family may come in between.

### Limitations

Possible weaknesses of the present study are as follows. First, the sample is limited to psychiatric patients with major depression so the findings may not be generalized to primary care patients. Likewise, social function is apparently under influences from the societal system and these findings obtained in Japan may not be generalizable to other countries. Second, although the follow-up percentage of 69.9% of all the observation points during the 10 years compares favourably both with 72.4% of Hays et al.'s (1995) primary care study in its two-year follow-up and with 65.6% of the NIMH CDS (Judd et al., 2008), the findings may still have been biased in an unknown direction.

Third, because this was a naturalistic study and the treatment was not controlled, the effect of treatment on the

course of social adjustment cannot be known, especially because the recorded level of antidepressant treatment may have been less than optimal particularly in the continuation/maintenance phases of treatment (Fujita et al., 2008). Neither has it been possible to identify positive and negative life events that must have occurred in the lives of the participating patients and which may very well have influenced their social adjustment in addition to the fluctuations of depressive symptoms. Finally, the primary measures in this study, the SAS-SR and the CES-D, are both self-report measures and they may show exaggerated correlations beyond that which truly exists between social adjustment and depressive symptomatology. Information from independent sources such as family members and/or performance-based data can enrich our insight into this very important problem in the future.

## Conclusion

In summary, this study found: (i) psychiatric patients with major depression commencing treatment show moderate to extremely large social dysfunction at baseline; (ii) this dysfunction declines rapidly in the first six months of treatment but then levels off and shows fluctuating patterns up to 10 years of follow-up; (iii) the degree of dysfunction varies from domain to domain, being most notable in Work and least notable in Economy subscales; and (iv) the influence of persistent depression also varies from domain to domain, being stronger in Housework and Leisure and weakest in Work spheres. Future studies of social adjustment in depression and in psychiatric disorders in general must differentiate its various aspects and also include independent information sources.

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