Recovery from depressive symptoms is associated with improvements in diabetes self-care, glycaemic control, diabetes distress and quality of life: a prospective study

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ABSTRACT

Depressive symptoms in diabetes are associated with reduced self-care, glycaemic control and health-related quality of life (hrQOL) and increased diabetes-specific distress. We analysed if the recovery from depressive symptoms would be associated with improvements in these aspects. 182 diabetes patients (age 45 ± 14 y.; 57% female; BMI 29 ± 7; 62% type 1 diabetes; illness duration 15 ± 11 y.; 95% with insulin; HbA1c 8.8 ± 1.7%) with subclinical depressive symptoms (CES-D score ≥ 16 without meeting criteria for clinical depression; mean CES-D score: 23 ± 8) participated in a prospective study. Recovery was defined as CES-D score < 16 at 12-month follow up. Dependent variables were diabetes self-care (SDSCA), glycaemic control (HbA1c), diabetes distress (PAID) and hrQOL (SF-36). We compared baseline-to-follow up changes between recovered versus non-recovered patients using ANCOVA (adjusted for baseline values). At follow up, 85 patients (47%) showed recovery. The mean reduction of depressive symptoms in this group was –13 ± 9 CES-D scale points; the mean change in the 97 patients remaining depressed (53%) was +2 ± 9 CES-D scale points. Recovered patients compared to unrecovered ones showed significantly greater improvement (baseline-to-follow up change) regarding self-care (+0.14 ± 1.11 vs. –0.19 ± 1.05 SDSCA scale points, Δ = 0.31, P = 0.014), glycaemic control (–0.78 ± 2.19 vs. –0.56 ± 1.53 HbA1c %-points, Δ = 0.12, P = 0.042), diabetes distress (–13.6 ± 18.8 vs. –4.4 ± 17.1 PAID scale points, Δ = 0.51, P < 0.01) and hrQOL (physical hrQOL: +2.0 ± 8.7 vs. –1.1 ± 9.6 T scores, Δ = 0.34, P = 0.005; mental hrQOL: +14.5 ± 11.9 vs. +0.1 ± 12.2 T scores, Δ = 1.19, P < 0.01). This study provides evidence that recovery from depressive symptoms may have positive impact on diabetes control, diabetes-specific distress and quality of life.

INTRODUCTION

Depressive disorders are a frequent comorbid condition in people with diabetes with an estimated prevalence about of 11 – 16%. Additionally, an even larger percentage of patients report elevated depressive symptoms without meeting full diagnostic criteria for a depressive disorder. Studies assessing negative impact of comorbid depression in diabetes found significantly reduced self-care activities, glycaemic control and long-term prognosis compared to people with diabetes without depressive symptoms. Health-related quality of life was also found to be greatly impaired in this group. Notably, evidence of negative impact of comorbid depression was found not only in people with clinical depressive disorders but also subclinical forms such as minor depression. In sum, these findings suggest that depressive symptoms predict poorer health outcomes and quality of life in people with diabetes.

Based on this evidence, a number of studies aimed to improve diabetes-related health outcomes in these patients through behavioural or pharmacological treatment for depression. However, few studies were able to demonstrate significant treatment effects on medical outcomes such as glycaemic control, and the overall evidence of benefits gained through the reduction of depressive symptoms is largely inconsistent. On the other hand, obtaining a treatment does not need to indicate adequate recovery from depression, even if the mean between-group treatment effect was significant. In fact, the potential benefits of recovery from depression regarding health outcomes might be more reliably estimated through a direct comparison between patients with large versus small changes in depression levels instead of comparisons between treatment groups. To assess associations between recovery from depressive symptoms and potential changes in diabetes-related health outcomes in people with diabetes, we analysed data from the DIAMOS study, a randomised controlled trial testing a diabetes-specific cognitive-behavioural treatment for subclinical depression.

METHODS

182 people with diabetes (age 45 ± 14 years; 57% female; BMI 29 ± 7 kg/m2; 62% type 1 diabetes; illness duration 15 ± 11 years; 95% with insulin treatment; HbA1c 8.8 ± 1.7% [73 ± 19 mmol/mol]; see table 1) with subclinical depressive symptoms (defined as having a CES-D score ≥ 16 without meeting DSM-IV criteria for major depression; mean CES-D score was 23 ± 8) participated in a prospective trial (DIAMOS study; identifier NCT01009138). Recovery from depressive symptoms was defined as having a CES-D score < 16 at 12-month follow up. Dependent variables (diabetes-related health outcomes) were diabetes self-care (Summary of Diabetes Self-Care Activities Measure [SDSCA]), glycaemic control (HbA1c), physical and mental health-related quality of life (Short Form-36 Health Survey [SF-36]) and diabetes-specific distress (Problem Areas in Diabetes Scale [PAID]). We compared baseline-to-follow up changes between recovered versus non-recovered patients using ANCOVAs (adjusted for baseline group differences of the outcome variables).

RESULTS

- At 12-month follow up, 85 of the patients (47%) showed CES-D scores lower than 16 indicating recovery from depressive symptoms (see figure 1). The mean reduction of depressive symptoms in this group was –12.9 ± 9.1 CES-D scale points; the mean change in the 97 patients remaining depressed (53%) was +1.6 ± 9.4 CES-D scale points.
- Patients who recovered from depressive symptoms (follow up CES-D scores < 16) showed significantly greater improvement (baseline-to-follow up change) than those with persistent depressive symptoms regarding self-care (+0.14 ± 1.11 vs. ¬–0.19 ± 1.05 SDSCA scale points, Δ = 0.31, P = 0.014) and glycaemic control (–0.78 ± 2.19 vs. –0.56 ± 1.53 HbA1c %-points, Δ = 0.12, P = 0.042). Moreover, they showed significantly greater improvement in physical and mental health-related quality of life (physical hrQOL: +2.0 ± 8.7 vs. –1.1 ± 9.6 T scores, Δ = 0.34, P = 0.005; mental hrQOL: +14.5 ± 11.9 vs. +0.1 ± 12.2 T scores, Δ = 1.19, P < 0.001) as well as diabetes-specific distress (–13.6 ± 18.8 vs. –4.4 ± 17.1 PAID scale points, Δ = 0.51, P < 0.001); results are displayed in figure 2.
- If the criterion for depressive symptoms was set at a higher cut-off score of ≥ 22 in the CES-D scale, indicative of more severe depressive symptoms (this score shows the best likelihood ratio for depression in the German population), 104 patients (57% of the sample) met the criterion at baseline and 58 patients (32%) showed relevant recovery at follow up (CES-D score ≥ 22 at baseline and < 22 at follow up; see figure 1). The mean reduction in this group was –16.9 ± 8.0 CES-D scale points while the mean change in the 124 remaining patients was +0.3 ± 8.8 points.
- Patients in this 'recovered group' (CES-D score ≥ 22 at baseline and < 22 at follow up) showed greater improvement regarding self-care (+0.29 ± 1.02 vs. ¬–0.18 ± 1.09 SDSCA scale points, Δ = 0.45, P = 0.007) and glycaemic control (–1.08 ± 2.31 vs. –0.48 ± 1.60 HbA1c %-points, Δ = 0.30, P = 0.055), although the latter result bordered on significance. They also showed greater improvement in health-related quality of life (physical hrQOL: +2.3 ± 9.9 vs. –0.5 ± 8.9 T scores, Δ = 0.30, P = 0.055; mental hrQOL: +16.3 ± 11.5 vs. +2.4 ± 12.9 T scores, Δ = 1.14, P < 0.001) as well as diabetes-specific distress (–20.1 ± 16.8 vs. –3.5 ± 16.8 PAID scale points, Δ = 0.99, P < 0.001); results are displayed in figure 3.

CONCLUSION

This study provides evidence that recovery from depressive symptoms may have positive impact on diabetes self-care behaviour and medical health outcomes such as glycaemic control. Additionally, people with diabetes who recovered from depressive symptoms reported significant improvements regarding health-related quality of life and diabetes-specific distress. The finding of increased self-care and glycaemic control is of particular interest as many studies struggled to find associations between depression treatments and improvements in these outcomes. Notably, we found stronger improvements in these variables when setting the criterion for recovery at a higher depression score, suggesting that particularly the recovery from strong depressive symptoms or depressive disorders may yield benefits regarding diabetes-related health outcomes (the fact that the 'glycaemic control improvement' [Δ = 0.30] in this comparison bordered on significance [P = 0.055] is a limitation but can be explained by lacking statistical power due to small sample size [n = 58]). We hypothesised that such benefits of recovery from depression might be more reliably estimated through a direct comparison between patients with large versus small changes in depression levels, which was supported in this study. Against this background, future treatment studies regarding depression in diabetes might be well advised to not only examine between-group effects on health outcomes but to compare 'responders' (regardless of whether verum- or placebo-treated) to those remaining symptomatic. In sum, our findings suggest that effective treatments of depression in diabetes can indeed yield positive effects on medical outcomes.

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Table 1: Sample characteristics at baseline

Variable	*N* = 182	T1DM (62%)	T2DM (38%)
Age in years (M ± SD)	45 ± 14	39 ± 12	55 ± 9
Female gender (%)	57%	61%	50%
BMI in kg/m^2(M ± SD)	29 ± 7	26 ± 4	35 ± 7
Diabetes duration in years (M ± SD)	15 ± 11	15 ± 12	14 ± 9
With insulin therapy (%)	95%	100%	88%
With long-term complications (%)	52%	40%	72%
HbA_{1c} in % (mmol/mol) (M ± SD)	8.8 ± 1.7 (73 ± 19)	8.6 ± 1.7 (71 ± 19)	9.1 ± 1.6 (75 ± 18)

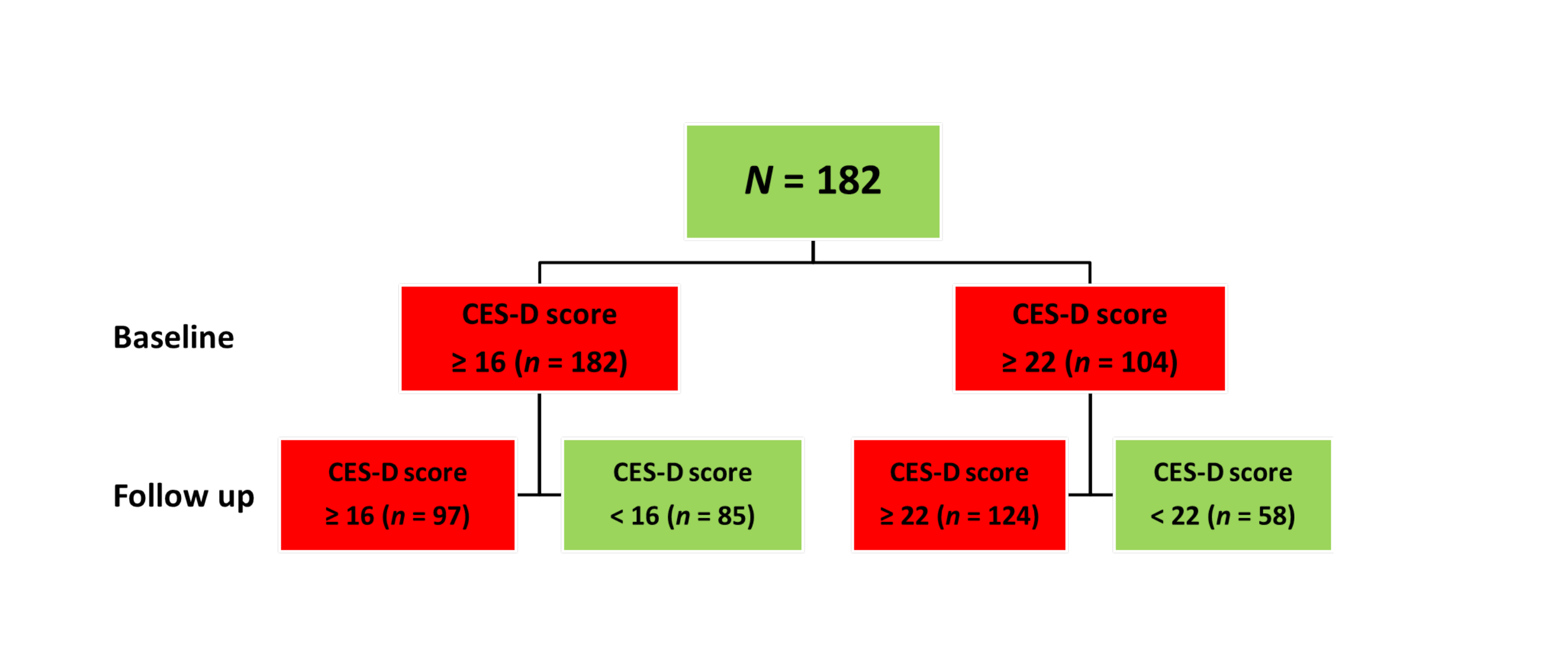

Figure 1: Course of depressive symptoms over 12 months and rates of recovery under the CES-D cut-off scores of 16 and 22 respectively

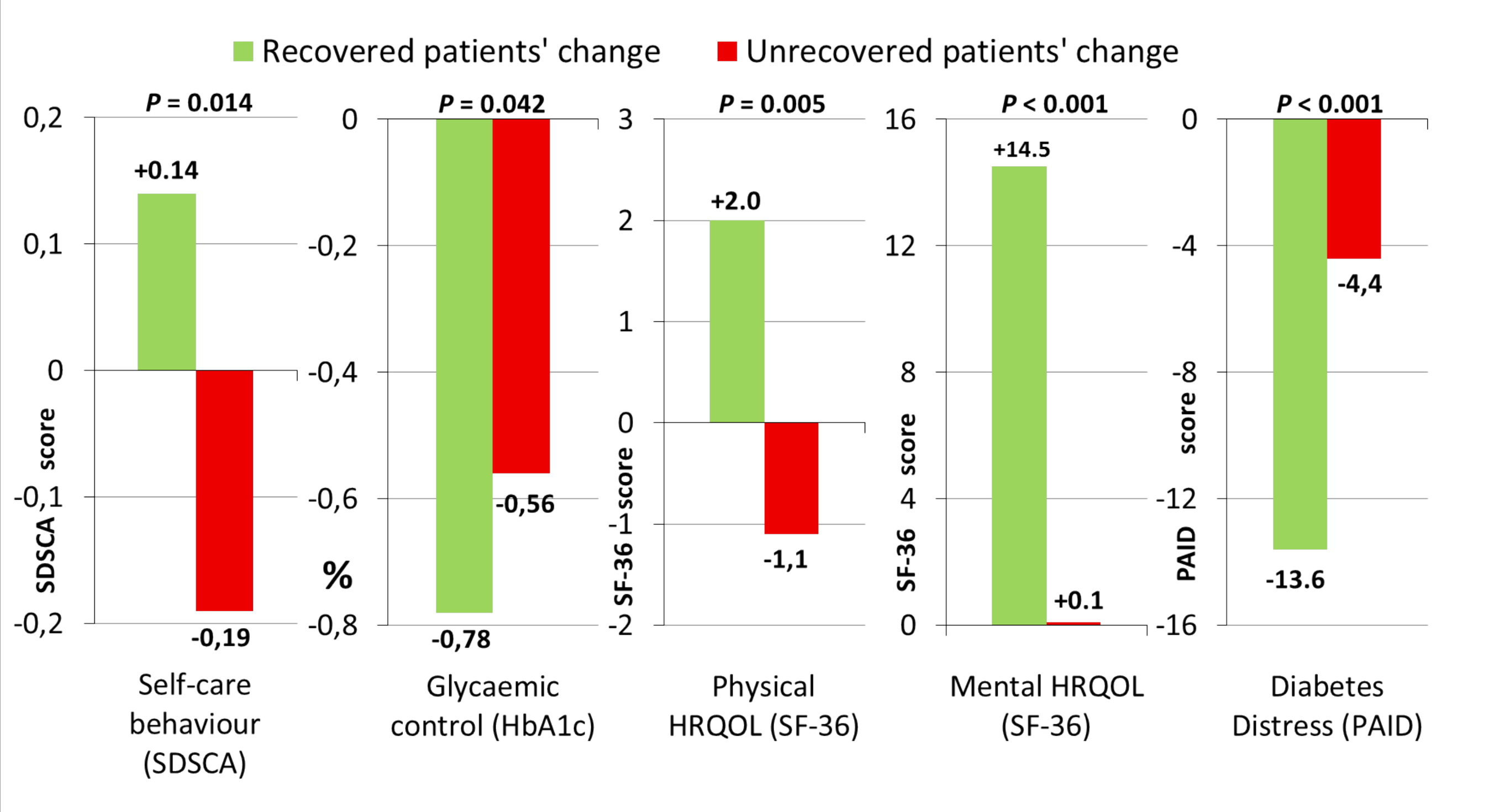

Figure 2: Baseline-to-follow up changes in patients who recovered versus did not recover under the CES-D cut-off scores of 16

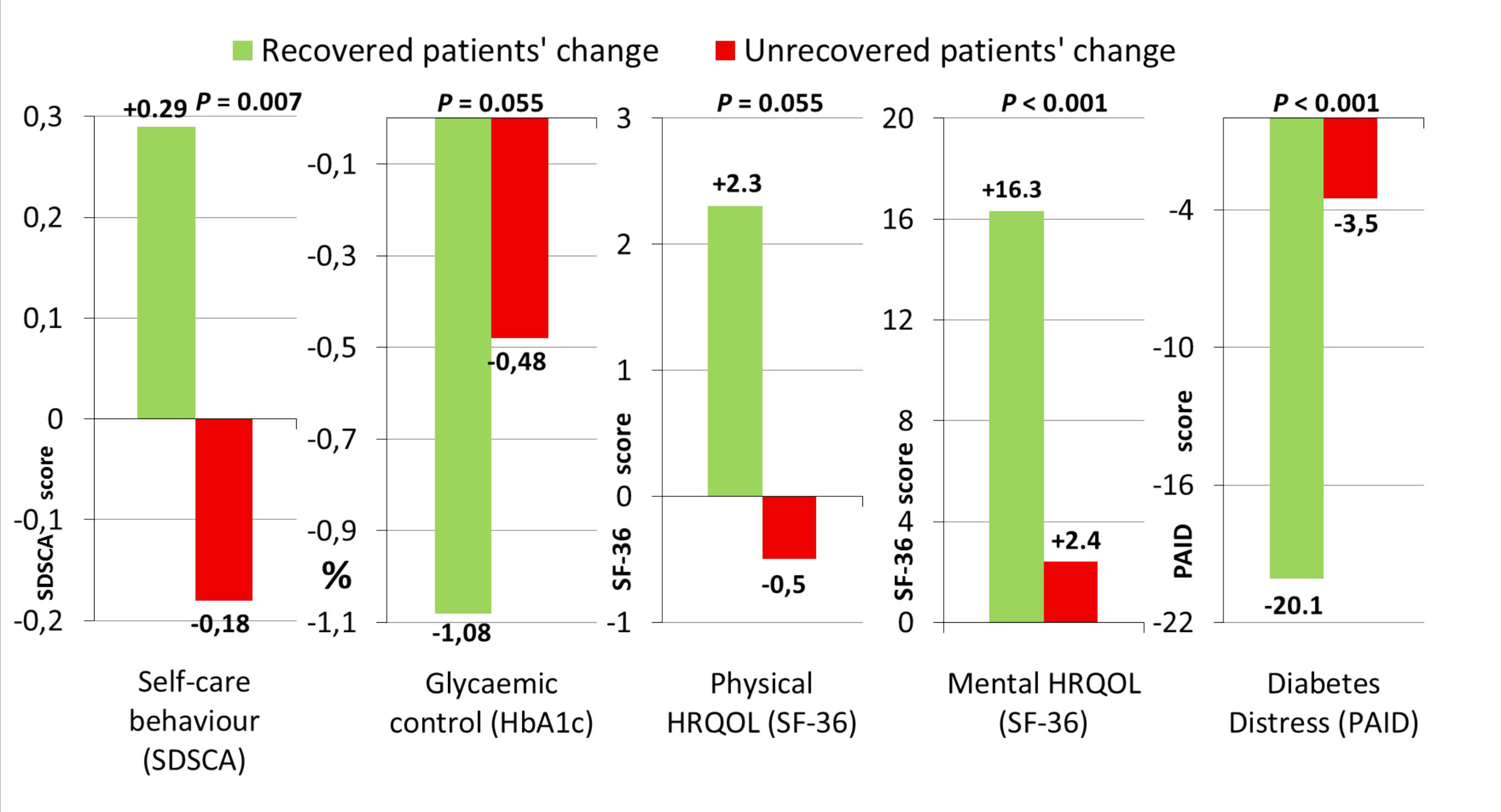

Figure 3: Baseline-to-follow up changes in patients who recovered versus did not recover under the CES-D cut-off scores of 22