

# The effect of a diabetes-specific cognitive behavioural treatment programme (DIAMOS) for people with diabetes and subthreshold depression

## BACKGROUND & AIMS

Subthreshold depression is one of the most frequent mental comorbidities in people with diabetes and is associated with a poorer long-term prognosis. Since specific intervention concepts are missing a new self-management oriented group programme (DIAMOS) was developed for this patient group and evaluated in a randomised trial.

## MATERIALS & METHODS

DIAMOS comprises cognitive-behavioural interventions aiming at the reduction of diabetes distress. The active control group (CG) received diabetes education. Patients completed the following psychometric questionnaires at baseline and 12-month follow-up: Center of Epidemiological Studies Depression Scale (CES-D), Patient Health Questionnaire (PHQ-9), Problem Areas in Diabetes Scale (PAID), Diabetes Distress Scale (DDS), WHO-Five Well-being Index (WHO-5), Summary of Diabetes Self-care Activities Measure (SDSCA), Acceptance and Action Diabetes Questionnaire (AADQ), and Diabetes Treatment Satisfaction Questionnaire (DTSQ). The primary outcome was the reduction of depressive symptoms (CES-D, PHQ-9). Secondary outcomes were changes in diabetes distress (PAID, DDS), well-being (WHO-5), self-care behaviour (SDSCA), diabetes acceptance (AADQ), treatment satisfaction (DTSQ), HbA<sub>1c</sub> and inflammatory markers. 214 patients were randomised; the study flow is displayed in figure 1.

## RESULTS

- Baseline characteristics (age 43.3 ±13.3 yrs., female gender 56.5%, diabetes duration 14.2 ±10.5 yrs., type 2 diabetes 34.1%, BMI 28.7 ±7.1 kg/m<sup>2</sup>) were comparable in both groups except for diabetes types, BMI and macrovascular complications (see table 1).
- At 12-month follow-up there was a significantly greater reduction of depressive symptoms according to the CES-D and PHQ-9 scores in DIAMOS than in the CG (Δ -3.7 respectively Δ -1.5, all p < .05) (see figures 2 and 3). Per-protocol as well as intention-to-treat analyses revealed significant superiority of DIAMOS in reducing depressive symptoms (see figure 4).
- Moreover, the risk of incident major depression (assessed by the PHQ-9) in DIAMOS was significantly reduced (OR 0.63, 95%-CI 0.42 to 0.96, p = .028) (see figure 5).
- Additionally, diabetes distress as measured by the PAID and DDS was significantly more strongly reduced in DIAMOS (Δ -8.3 respectively Δ -0.22, all p < .05) (see figures 6 and 7).
- HbA<sub>1c</sub> was significantly improved in DIAMOS and the CG without a significant difference between the groups (see figure 8).

- No significant between-group differences were observed regarding well-being, self-care behaviour, diabetes acceptance and treatment satisfaction (data not shown).
- Regarding inflammatory markers (IL-1RA, IL-6 and adiponectin) no significant effects were observed (data not shown).

## CONCLUSION

DIAMOS is effective in lowering depressive symptoms and diabetes-related distress in people with diabetes patients and subthreshold depression. Moreover, DIAMOS has a preventive effect regarding the incidence of major depression.

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Table 1: Sample characteristics

Mean ± SD / %	DIAMOS (n = 106)	Control Group (n = 108)	p
Age – years	43.2 ± 14.9	43.4 ± 13.8	.911
Female gender – n (%)	60 (56.6%)	61 (56.5%)	.986
Years of education – years	11.3 ± 3.0	10.8 ± 2.7	.232
Type 1 diabetes – n (%)	63 (59.4%)	78 (72.2%)	.049
Diabetes duration – years	14.2 ± 10.3	14.2 ± 10.7	.992
HbA <sub>1c</sub> – %	8.9 ± 1.8	8.9 ± 1.8	.722
– mmol/mol	64.5 ± 10.2	67.4 ± 12.4	
BMI – kg/m <sup>2</sup>	29.8 ± 7.7	27.7 ± 6.3	.029
# with microvascular complications – n (%)	57 (53.8%)	49 (45.4%)	.219
# with macrovascular complications – n (%)	18 (17.0%)	7 (6.5%)	.017

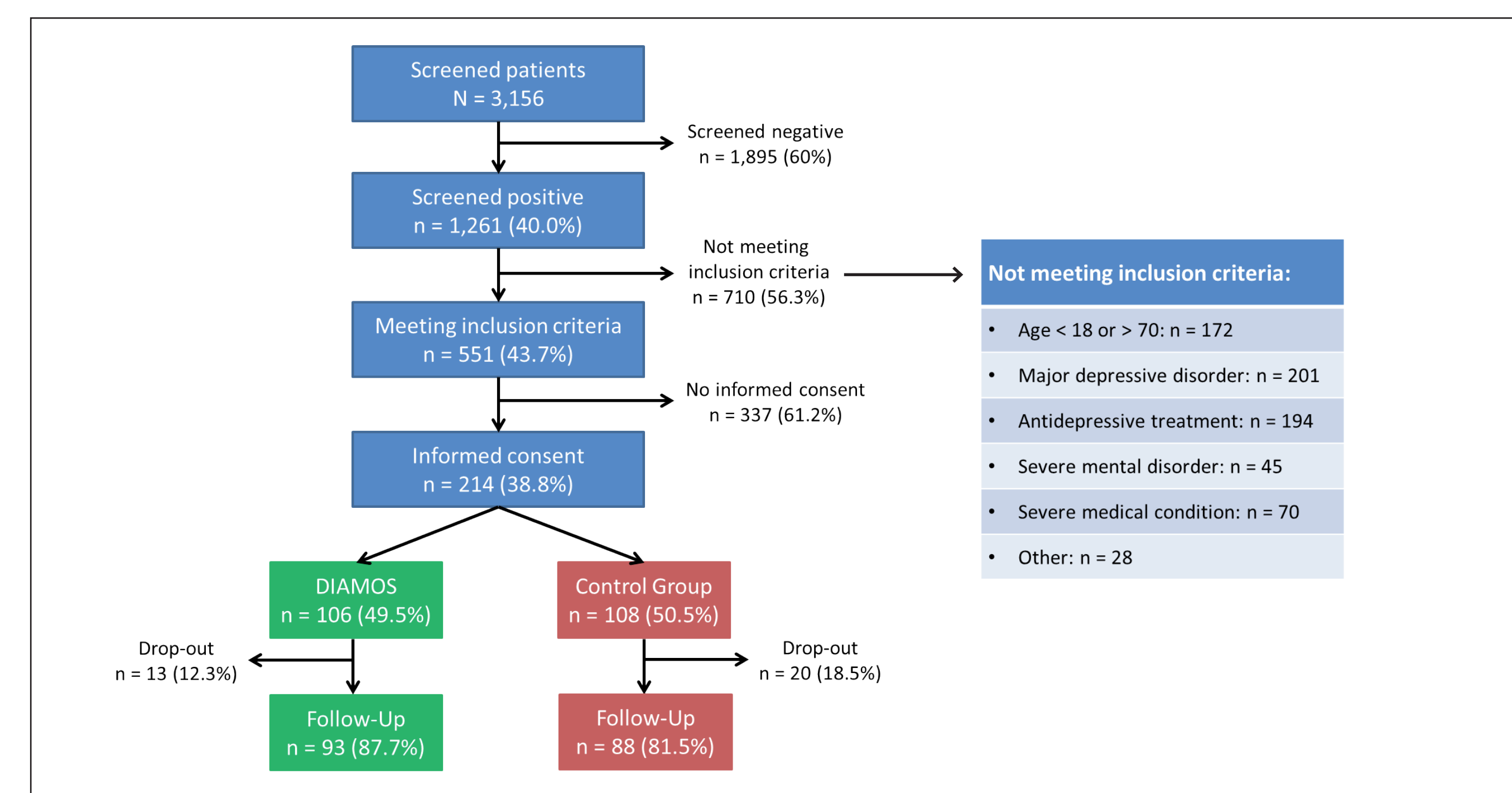


Figure 1: Study flow chart

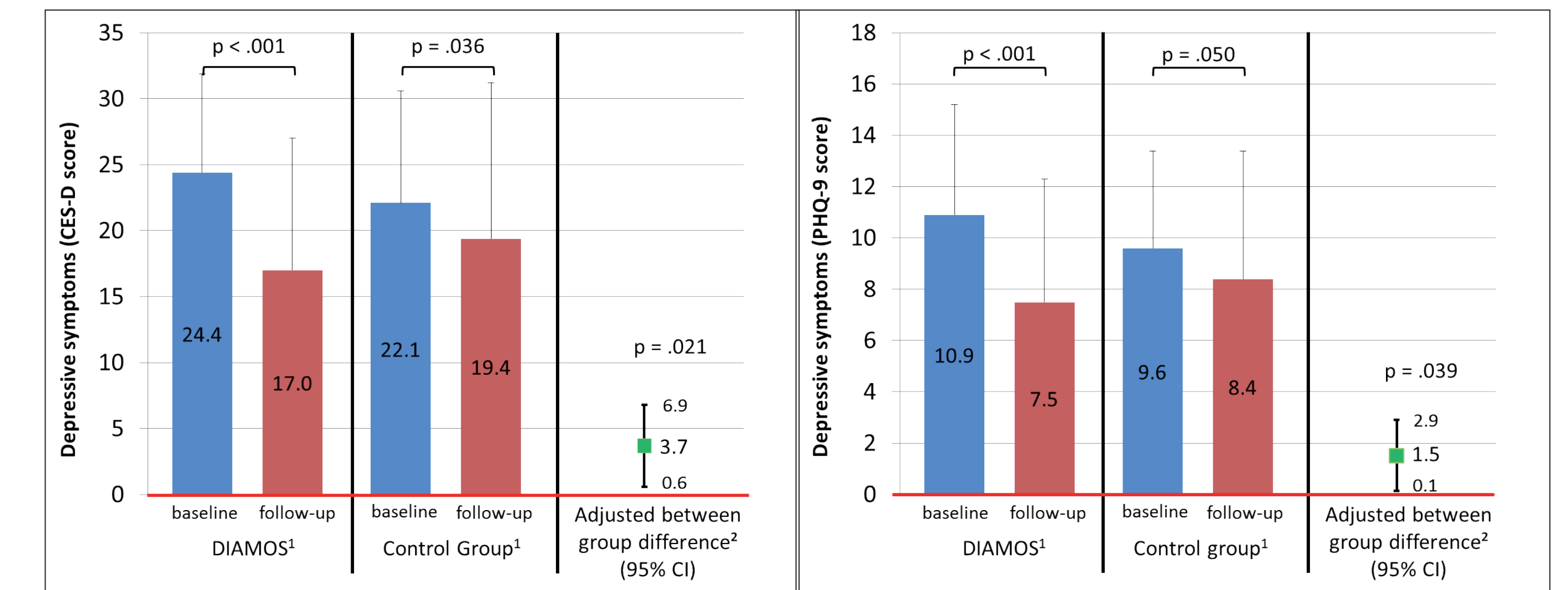


Fig. 2: Reduction of depressive symptoms (CES-D) Fig. 3: Reduction of depressive symptoms (PHQ-9)

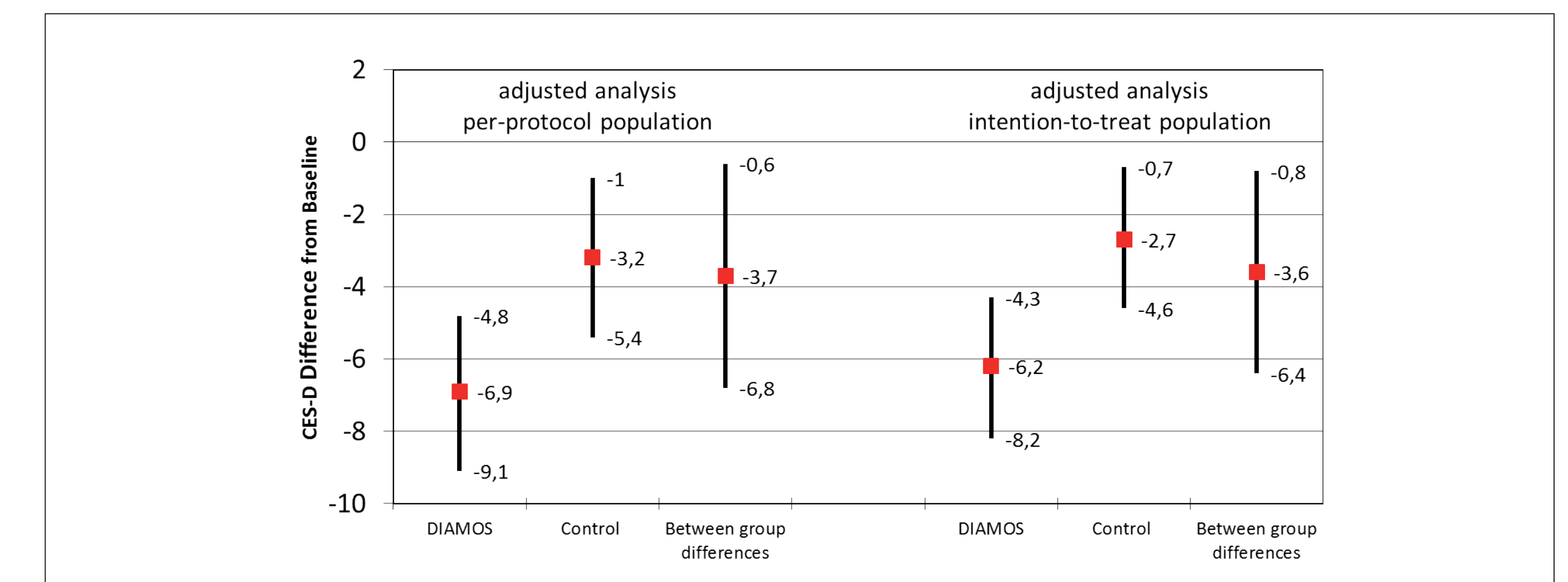


Fig. 4: Reduction of depressive symptoms (CES-D) in per-protocol and intention-to-treat analyses (adjusted mean differences and 95% confidence intervals)

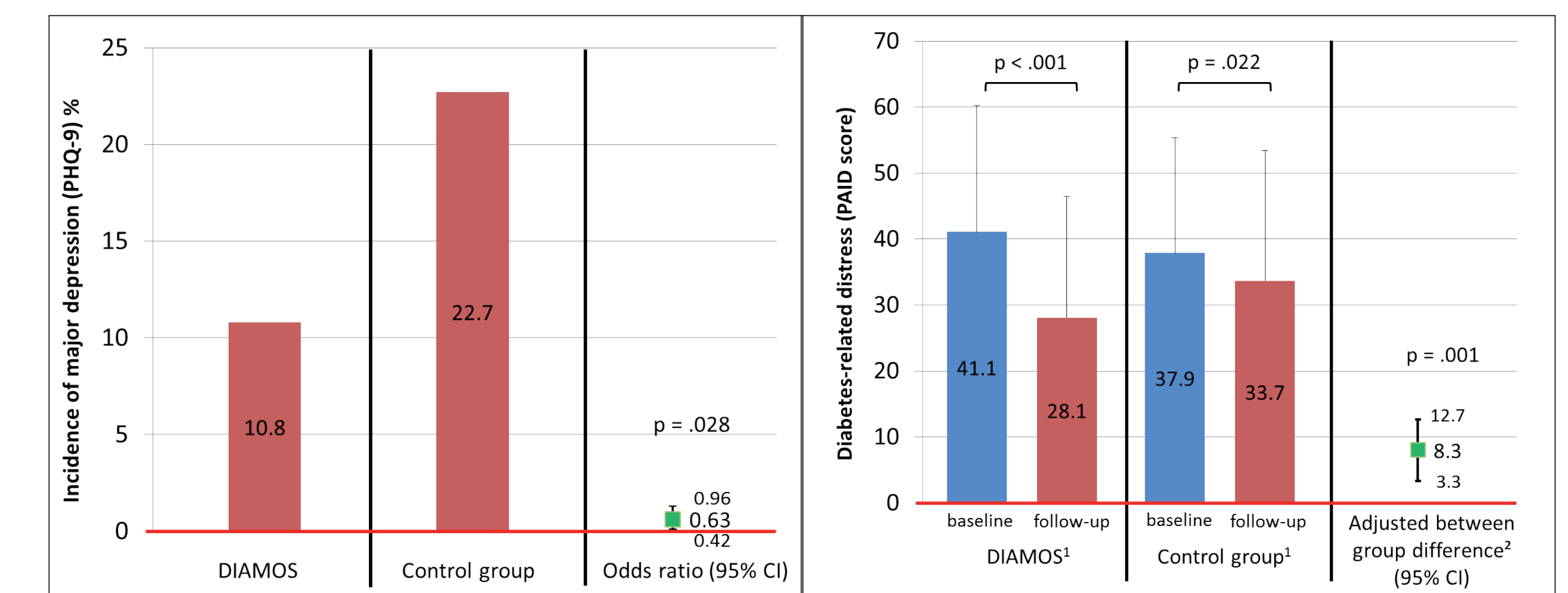


Fig. 5: Reduction of major depression incidence (PHQ-9) Fig. 6: Reduction of diabetes-related distress (PAID)

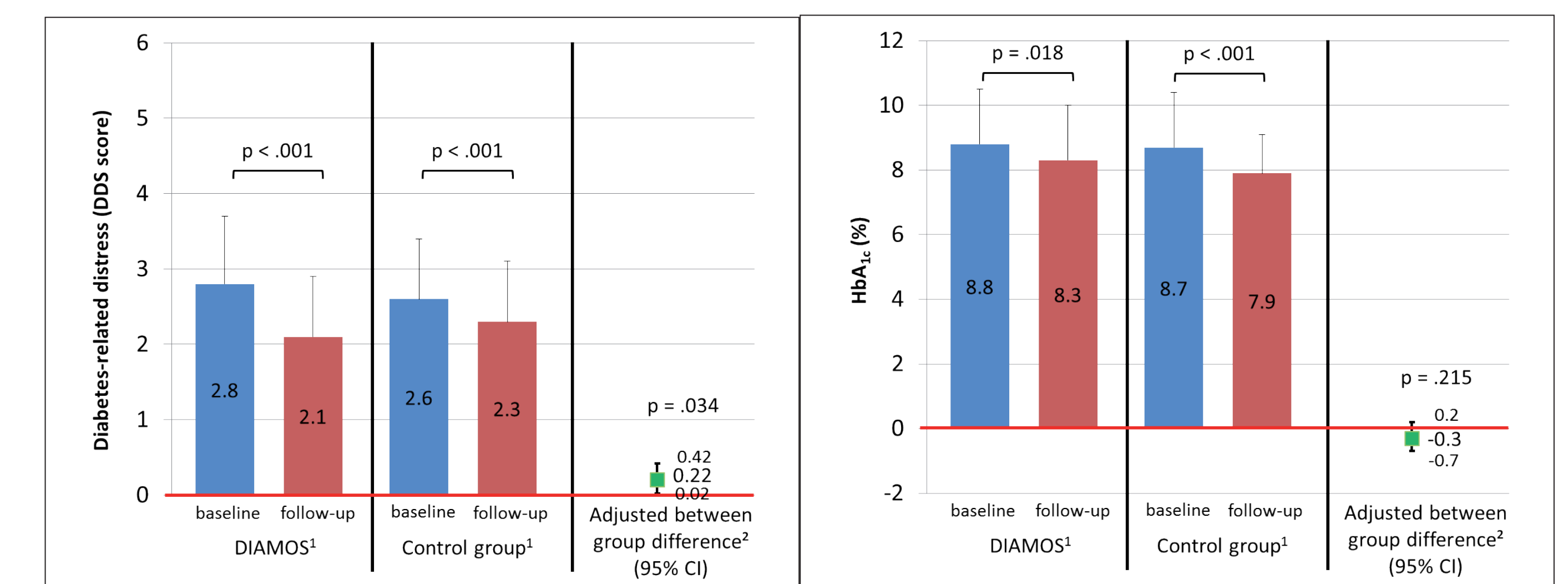


Fig. 7: Reduction of diabetes-related distress (DDS) Fig. 8: Improvement of HbA<sub>1c</sub>

<sup>1</sup> mean ± standard deviation; <sup>2</sup> mean adjusted between group baseline-endpoint-change adjusted for BMI, diabetes type, and baseline values