English summary
Chapter 1
This thesis is about diabetes-distress, which is a diabetes-specific type of emotional distress. It reflects worries and fears that specifically pertain to living with diabetes and its consequences, e.g. worrying about the disease, fear of developing complications and feeling overwhelmed by diabetes and its management. Diabetes-distress presents in 10-30% of patients with diabetes, depending on the setting and patient population. It is associated with worse glycaemic control and impaired quality of life. In this thesis, specific attention has been given to the prevalence of diabetes-distress in different populations, consequences of diabetes-distress and treatment.

Chapter 2
Previous studies have shown that ethnic descent is related to differences in the prevalence of depressive symptoms and diabetes-distress in the U.S. It is yet unknown whether similar ethnic differences exist in patients with diabetes in Europe, nor do we know which factors could explain possible disparities with relation to emotional distress. We therefore set out to study the association between ethnicity and emotional distress in an ethnic diverse diabetes patient population. Diabetes-distress was reported by 12.5% of the native Dutch patients and by 22.0%, 34.5%, and 42.6% of the Surinamese, Turkish, and Moroccan patients, respectively. Prevalence of depressive symptoms was 9.4% in native Dutch patients and 20.4%, 34.5%, and 27.3% in the other groups mentioned. Diabetes-distress and Moroccan origin were significantly associated in multivariable regression analysis, as well as depressive symptoms and Turkish origin. These findings show that ethnic minorities with diabetes vary in their vulnerability for emotional distress.

Chapter 3
Fear of hypoglycemia presents in 10–25% of persons with diabetes and has a negative impact on well-being, diabetes self-management and metabolic control. In medical practice, the extensive screening lists are insufficiently used outside research settings and hypoglycemia’s are both underreported and not asked for. This could be bypassed by a quick and practical screening procedure in busy clinics. Therefore we developed the Quick Screening for Fear of Hypoglycemia (QSFH) instrument as a two-item quick screener to identify probable fear of hypoglycemia in persons with diabetes. We determined its psychometric properties in comparison to the 33-item Hypoglycemia Fear Survey (HFS-II) and its recently developed 11-item short form. The QSFH has adequate psychometric properties: Cronbach’s α was 0.80, illustrating high reliability. Sensitivity and specificity were 0.83 and 0.82 respectively. The area under the ROC-curve was 0.87 which is considered an indicator of a good screener.
Chapter 4
Around 12% of pregnant women develop gestational diabetes mellitus (GDM), which is associated with increased health risks for both mother and child and pre- and postpartum depression. Little is known about the relationship of GDM with diabetes-distress. The aims of this study were to assess the prevalence of diabetes-distress in GDM and its association with adverse pregnancy outcomes, including postpartum depression, neonatal hospitalization, macrosomia, jaundice, hypoglycemia, shoulder dystocia, caesarean section, hypertension, pre-eclampsia, fluxus, severe perineal tearing and other. The prevalence of diabetes-distress was 36%, 10% reported elevated prepartum depressive symptoms and 12% elevated postpartum depressive symptoms. Multivariable logistic regression analyses revealed that both high diabetes-distress and parity, but not prepartum depressive symptoms were related to adverse pregnancy outcomes.

Chapter 5
It is known that depression is associated with increased healthcare utilization and costs in diabetes patients. However, studies on the association between diabetes-distress, costs and healthcare utilization are currently lacking. In this chapter we aim to explore whether diabetes-distress is related to higher healthcare utilization and medical costs after adjusting for depression and other confounders. Diabetes-distress was related to healthcare utilization, but not to healthcare costs. When controlling for depressive symptoms, comorbidity, age, ethnicity, socioeconomic status and diabetes duration, diabetes-distress remained associated with healthcare utilization: persons with elevated diabetes-distress had 9 more healthcare contacts annually than persons without diabetes-distress.

Chapter 6
We set out to test an intervention for diabetes-distress, delivered by diabetes specialist nurses. Persons who screened positive for diabetes-distress were scheduled for two PAID-interviews with their diabetes specialist nurse. However, several implementation problems were encountered during the course of the intervention. Results of semi-structured interviews with both caregivers and patients revealed several delivery barriers and obstacles within the intervention. Overall, deficiencies were primarily seen in the lack of support and transparency of step-by-step procedures, a lack of knowledge, awareness, expected roles and responsibilities from personnel (mainly supportive medical staff and internists), and the logistical distribution of the questionnaires. The least amount of problems seemed to occur in diabetes nurses, who delivered the PAID-interviews. Most problems were encountered by the supportive medical staff who were responsible for the logistics of the intervention. Despite these implementation problems, both caregivers and patients considered the intervention to be helpful and needed.
Chapter 7
The clinical relevance of diabetes-distress is increasingly recognized, but little is known about the efficacy of interventions specifically targeted to treat elevated diabetes-distress. Therefore, in this chapter we sought to determine the efficacy of psychological interventions aimed at treating elevated diabetes-distress in people with Type 1 or Type 2 diabetes. In a random-effects meta-analysis diabetes-distress reduced significantly with a pooled effect size of 0.48 (Cohen’s d). Diabetes-tailored psychological interventions reduced HbA1c (Cohen’s d = 0.57), whereas mindfulness-based interventions did not. This systematic review shows that specifically diabetes-tailored psychological interventions are effective in reducing elevated diabetes-distress and HbA1c, and that diabetes-distress is responsive to psychological treatment in general.

Chapter 8
In this final chapter the results of the performed studies are summarized and discussed. Lastly, clinical implications and suggestions for future research are given. The data reported in this thesis emphasize that diabetes-distress is an important construct in patients with diabetes, that should not be dismissed. It is essential that clinicians are able to recognize and discuss diabetes-distress with their patients, and refer to specialized help if needed. An important role for future research lies in the adequate implementation of intervention studies for diabetes-distress in clinical practice. The different and overall high prevalence of diabetes-distress in ethnic minorities deserves specific attention. Future research should focus on explaining these differences, and developing culture-tailored interventions for diabetes-distress. These interventions should be developed in consultation with patients, in order to tailor the treatment to their needs and preferences.