Chapter 2
Disentangling Clinical Depression from Diabetes-Specific Distress: Making Sense of the Mess We've Made

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Abstract This chapter examines conceptual and applied issues regarding the screening of depression and diabetes-specific distress in adults with diabetes. We explore the conceptualization of depression as a frequently comorbid condition of diabetes and the importance of diabetes-specific distress and subthreshold depressive symptoms in regard to the emotional, behavioral, and health outcomes of living with diabetes. Overviews of the constructs of major depressive disorder (MDD) and diabetes-specific distress and challenges to an operational approach to negative emotion in the context of chronic illness are also presented in light of the meaningful overlap between diagnostic criteria of MDD and symptoms of diabetes and distress related to the burden of living with diabetes. Assessment of both depression and diabetes-specific distress are considered, including methodological issues and the strengths and weakness of leading self-report and semi-structured interview tools. Finally, suggestions for valid and clinically meaningful assessment of depressive symptoms and diabetes-specific distress in medical settings are discussed.

Keywords Diabetes • Depression • Diabetes-specific distress • Diabetes-related distress • Depression screening • Assessment

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C.E. Lloyd et al. (eds.), *Screening for Depression and Other Psychological Problems in Diabetes*,
DOI 10.1007/978-0-85729-751-8_2, © Springer-Verlag London 2013

Introduction

Depression is increasingly recognized as a major psychosocial problem in people with diabetes. A large literature that seems to have grown exponentially over the last decade demonstrates increased prevalence of depression in diabetes patients as compared to those without diabetes [1, 2]. It also shows that depression is related to poorer diabetes self-management [3] and glycemic control [4]. While early studies showed a consistent cross-sectional relationship between depression and diabetes complications [5], leaving questions of directionality in doubt, more recent longitudinal investigations show that depression predicts the onset of complications [6–8] and mortality [6, 9, 10] over time in patients with diabetes. Based on this compelling set of findings, the importance of screening and providing treatment for depression in patients with diabetes has been emphasized, based on the reasonable expectation that identifying and treating depressed diabetes patients may result in improved diabetes outcomes. Investigations focusing on screening and treating depression in diabetes have been numerous. However, despite the rapid growth of research in this area, basic questions regarding the conceptualization and measurement of depression in diabetes continue to be the subject of considerable debate. Resolving these questions has important implications for screening and treating depression in people with diabetes.

One important question relates to the appropriateness of conceptualizing depression in diabetes as a comorbid mental illness. In the vast majority of studies that have examined depression in diabetes, the construct under investigation is major depressive disorder (MDD). Despite the consistency in application of the comorbid mental illness model to the problem of depression in diabetes, the screening measures most often used to evaluate MDD are often inadequate, have a high number of "false-positives," and may inaccurately pathologize subclinical psychological distress. We begin this chapter by providing an overview of the conceptual definition of MDD, as currently defined in the leading psychiatric diagnostic systems. We then challenge the dominance of this conceptualization and argue that the comorbidity model for MDD and diabetes mellitus has important limitations for assessment and treatment. First, we note that the current diagnostic guidelines for MDD ignore life context that may be causally related to depressive symptoms. Second, we review data showing an incremental association between depressive symptoms and diabetes outcomes, suggesting that depressive symptoms (even at subclinical levels) may be more closely associated with diabetes outcomes than MDD, per se. We also consider important findings that suggest that these symptoms are often closely related to, and in some cases predicted by, the experience of living with diabetes. Finally, we consider accumulating evidence that suggests that antidepressant therapy is ineffective for mild cases of MDD and subclinical presentations of distress.

An additional important question relates to the extent to which distress related to the burden (physical, emotional, and social) of living with diabetes may be confounded with the measurement of depression in diabetes. We describe the construct of diabetes-specific distress (DD) and discuss the problematic overlap between DD and MDD. We will make several arguments based on the available empirical literature: First, at the conceptual level, we posit that distress secondary to the burden of living with diabetes is qualitatively different from MDD, much more common

Table 2.1 Diagnostic criteria for major depression across the DSM-IV TR and the ICD-10

I.	Depressed mood
II.	Loss of interest or pleasure
III.	Fatigue or loss of energy
IV.	Decrease or increase in appetite or significant weight loss or weight gain
V.	Insomnia or hypersomnia
VI.	Psychomotor agitation or retardation
VII.	Poor concentration or indecisiveness
VIII.	Suicidal thoughts or acts
IX.	Loss of self-confidence or self-esteem
X.	Guilt or self-blame

Note: The DSM-IV TR requires the presence of at least one of the first two symptoms, as well as additional symptoms to total five or more (loss of self-confidence or self-esteem is not a symptom in the DSM-IV TR). The ICD-10 requires at least two of the first three symptoms, with the severity of the current episode indicated by the number of total symptoms (four for mild, six for moderate, and eight for severe).

among patients, and appears to be more closely related to diabetes self-management and glycemic control. Second, the screening measures typically used to evaluate MDD in the diabetes literature may often provide case-finding results that are more indicative of diabetes-specific distress than MDD. Finally, we will consider the implications of these issues for screening and treatment approaches to depression and distress in patients living with diabetes.

Major Depressive Disorder

Major depressive disorder (MDD) is the most commonly diagnosed psychiatric mood disorder in the general population [11, 12]. MDD in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV) and recurrent depressive disorder in the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) reflect one or more major depressive episodes, defined by the presence of depressed mood, loss of interest, fatigue or low energy, sleep disturbance, marked increase or decrease in appetite or weight, feelings of guilt or worthlessness (in the ICD-10 also loss of confidence or self-esteem), poor concentration, psychomotor retardation or agitation, and thoughts of death or suicidality (see Table 2.1) [13, 14]. These symptoms must be present nearly every day for at least a 2-week period, and both the DSM-IV and the ICD-10 specify that they must not be due to the direct effects of a substance and a medical condition and there must be no prior experience of a manic episode. The DSM-IV additionally specifies that the symptoms must interfere with important aspects of functioning and/or cause significant distress and must not be better accounted for by bereavement [13]. The DSM-IV does recognize the possibility that presentations of major depressive episode could be due to a medical condition and offers the diagnosis of mood disorder due to a general medical condition to account for these. However, the criteria for this diagnosis are quite restrictive. For example, there must be evidence "from the history, physical examination, or laboratory findings that the disturbance is the direct

physiological consequence of a general medical condition" ([13], p. 404). The requirement for a direct physiological mechanism is important, and the DSM-IV explicitly states that when the criteria for a depressive episode are met and these symptoms "are precipitated by the general medical condition acting as a psychosocial stressor, rather than resulting from the direct physiological effects of the general medical condition, the diagnosis would be Major Depressive Disorder" ([13], p. 184). Additionally, diabetes is not listed among the examples of associated general medical conditions in the DSM-IV. Thus, this diagnostic option is unlikely to be considered by most clinicians for depression in patients with diabetes.

The Role of Life Context in MDD

The DSM utilizes an operational approach to conceptualizing psychopathology, that is, an observational, rule-based approach to the identification and classification of psychiatric illness that predicates diagnosis on the presence or absence of specific symptoms [13]. The DSM-IV specifies that most life events (e.g., loss-related events other than bereavement) should not be factored into judgments of pathology when diagnosing MDD. This stands in contrast to a long history of thought from Hippocrates through to twentieth-century leaders of psychiatric theory and classification, who consistently regarded the distinction between normal loss-related sadness and pathological depression, or *melancholia*, as depending on a consideration of causal context and the proportional relation of symptom severity to this context [15]. For example, Freud acknowledged that the symptoms of bereavement and *melancholia* could be indistinguishable but emphasized the context of loss in understanding the distinction between the two experiences. As cited by Horowitz and Wakefield, he noted that "although grief involves grave departures from the normal attitude to life, it never occurs to us to regard it as a morbid condition" [16]. Similarly, and also cited by Horowitz and Wakefield, Kraepelin posited that "morbid emotions are distinguished from healthy emotions chiefly through the lack of a sufficient cause, as well as by their intensity and persistence…" [17]. Up through the DSM-II [18], which defined "depressive neurosis" as "manifested by an excessive reaction of depression due to internal conflict or to an identifiable event such as the loss of a love object or cherished possession," the question of *a disproportional* relationship between depressive symptoms and contextual explanations was central to the diagnosis of clinical depression. However, with the publication of the DSM-III [19] in 1980, the diagnostic system was significantly overhauled. Since then, DSM diagnosis has taken a neutral stance with respect to theories of etiology and the causal role of contextual factors; the current approach is largely centered on observable symptoms, isolated from context, and is aimed at increasing the consistency of diagnoses within and between clinicians [20, 21]. This focus on symptoms has resulted in increased reliability of diagnoses (e.g., if a sufficient number of specified symptoms are present, the disorder is present). However, it has also resulted in a dramatic increase in prevalence

of MDD, based at least in part on the increased reach of the diagnosis into presentations of sadness that were previously considered "normal" [15]. This shift in the diagnostic approach to clinical depression has important implications for understanding distress in patients with diabetes and currently encourages clinicians to ignore the physical, emotional, and social context of living with a burdensome chronic illness when evaluating MDD.

Empirical evidence suggests that presentations of MDD, in terms of symptoms, severity, and outcomes, that are explained by contextual factors related to loss of health, economic stability, or important relationships, are similar to those presented by individuals suffering from bereavement, the only loss-related contextual factor cited by the DSM-IV which exempts an individual from diagnosis of MDD. Wakefield and colleagues [15] suggest that if MDD symptoms in the presence of bereavement are accurately exempted from diagnosis as mental illness, symptoms in the face of other significant life events may also be considered non-pathological, although others use similar data to argue for the removal of the bereavement exemption for MDD diagnosis [22]. Recent research on judgments of the pathological nature of symptoms of distress suggests that experienced clinical psychologists often approach case material in a way that contradicts the DSM-IV's direction to ignore life context. When presented with vignettes describing unaffected, mildly distressed, or disordered behaviors following either traumatic or mildly distressing life events, clinical psychologists were significantly less likely to view symptoms as abnormal when a distressing life context was present than when no context was available to explain a patient's symptom disturbance. These findings held for MDD, for which the DSM-IV instructs clinicians to ignore life context, and posttraumatic stress disorder (PTSD), for which the DSM-IV requires a preceding traumatic event [23]. A lack of appropriate distress in response to a distressing event was also seen as disordered, reflecting the importance of a *proportionate response* to life events as part of the diagnostic rubric used by experienced clinical psychologists, across theoretical orientations.

Methodological Challenges of Assessment of MDD in People with Diabetes

The conceptual murkiness surrounding the construct of depression within diabetes, as well as the structure and psychometric weaknesses of the most common MDD assessment tools, presents challenges to research and clinical practice. At the most general level of measurement problems, physical symptoms associated with diabetes, such as fatigue, poor concentration, and appetite disruption, may be mistaken for symptoms of MDD [24]. Critically, the method of assessment may also impact on the accuracy and frequency of the diagnosis of MDD. Self-report questionnaires that assess depressive symptoms are often not strongly tied to diagnostic criteria for MDD. Yet, these are used in the majority of studies examining depression or distress in diabetes despite the fact they have been found to be more representative of more general levels of distress or well-being [25].

The self-report measures that do have acceptable psychometric properties for detecting MDD often achieve sensitivity at the cost of a high false-positive rate. The implications of this problem have been clearly demonstrated in medical populations, such as in cardiovascular disease [26].

Structured clinical interviews are considered the gold standard for assessing MDD. There are several frequently used diagnostic interview schedules that assess for DSM-IV and ICD-10 psychiatric disorders, including the Mini-International Neuropsychiatric Interview (MINI; [27]), the Composite International Diagnostic Interview (CIDI) [28], and the Structured Clinical Interview for DSM (SCID) [29]. However, the administration of structured clinical interviews requires training on the part of the interviewer and is often time consuming, posing a barrier to their widespread adoption in research and clinical assessment of MDD. Roy and colleagues [24] report that 80% of studies used self-report questionnaires, with the remaining 20% using a clinical interview based on MDD criteria, in their systematic review of diabetes research studies that utilized some type of depression measurement.

Fisher et al. [30] used both the Center for Epidemiologic Studies Depression Scale (CES-D) self-report questionnaire and a structured clinical interview, the CIDI, to assess depression in patients with type 2 diabetes. Results showed that 22% of participants reached the CES-D clinical cutoff, and 10% met diagnostic criteria based on the CIDI, resulting in a 70% false-positive rate for MDD based on the CES-D. Additionally, there was a worrisome rate of false-negatives; 34% of those with MDD did not meet the CES-D cutoff. Investigations using self-report diagnostic measures have found a point prevalence of depression 200–300% higher among people with diabetes compared to those without [1], whereas studies utilizing clinical interviews paint a more conservative picture, suggesting that the prevalence of MDD is only 40–60% more common among those with diabetes compared to those without [31]. Thus, setting aside the problems with our conceptual model for MDD in diabetes discussed in the preceding section, there is strong evidence to suggest that much of the research conducted on the relationship between diabetes and depression may be biased by measurement error in the assessment of MDD. Most of the patients we call "depressed" in our research studies would not meet the criteria for MDD and a significant minority of those who we deem "not depressed" would. This has undoubtedly resulted in imprecise measurement in research on the relationship between diabetes and depression. Equally important, it has resulted in patients being incorrectly identified as clinically depressed and offered antidepressant medication, which is not indicated for subclinical distress.

Subclinical Presentations of MDD Symptoms

Although most depression research in diabetes has focused on the construct of MDD, with the above-mentioned conceptual and measurement-error caveats, it is clear that a greater risk for poor diabetes outcomes is also seen in patients with subclinical elevations of depressive symptoms compared to those with no depression, including

increased risk of mortality (e.g., [6, 32]). This suggests that the experience of depressive symptoms that would not meet the diagnostic threshold for MDD is a risk factor for negative health outcomes in patients living with diabetes. Additionally, subclinical levels of depressive symptoms have been found to be 2–3 times as prevalent as clinical depression in adults with diabetes [1, 2]. Fisher and colleagues assessed patients with type 2 diabetes three times over an 18-month follow-up and found that while 20% of patients qualified for a diagnosis of MDD over that time frame, nearly 35% reported elevated symptoms of depression on the CES-D (CES-D ≥ 16) [31]. This elevation in symptoms of depression has been associated with poorer diabetes self-management (higher caloric intake, increased consumption of saturated fat, and decreased physical activity) in patients with type 2 diabetes, while meeting diagnostic criteria for MDD was not associated with diabetes self-management [30]. More importantly, the same elevation has also been associated with risk for diabetes complications, functional disability, and mortality over 7 years of follow-up [6]. Moreover, there was no apparent difference between the impact of MDD or subclinical depressive symptoms in predicting increased risk of negative health outcomes. Even those with "minimal depression" (CES-D = 1–15) experienced significantly increased risk for all negative health outcomes when compared to those with no symptoms of depression (CES-D = 0) [6]. These data clearly demonstrate an incremental relationship between symptoms of depression and negative health outcomes in diabetes, a relationship observed even at subclinical levels of depression severity. They challenge the model of MDD in diabetes, which conceptualizes the problem of depression as a categorical construct that is either present or not.

The concept of an incremental relationship between depressive symptoms and poor diabetes management was also examined in a survey of 879 primary care patients with type 2 diabetes [33]. Similar to the pattern observed by Black and colleagues [6] for health outcomes, results showed that self-reported depressive symptom severity predicted poor diabetes self-management behaviors (diet, exercise, and medication taking). Even among patients who scored below the screening cutoff for MDD, depressive symptom severity was still incrementally linked to poorer self-care [33]. Taken together, these findings suggest that we may be missing important avenues for clinical intervention when we focus on depression in diabetes only within the framework of MDD. While true MDD is clearly important and should be treated in patients with diabetes, subclinical presentations are much more common and are at least equivalently related to risk for poor self-management and treatment outcomes.

Diabetes as a Context for MDD

Despite being ignored by the diagnostic criteria for MDD, relationships between the lived experience of chronic illness, including diabetes, and depression have been found repeatedly throughout the literature. Clinically significant depression (CES-D ≥ 16) was 2.5 times more common in patients with diabetes and additional comorbid

chronic illness(es) when compared to those without comorbid illness [34]. Type 2 diabetes patients who screened positive for MDD were significantly more likely to be prescribed more medications, to have a higher BMI, and to be prescribed insulin than patients who did not meet screening criteria; a nonsignificant trend for greater number of comorbid illnesses was also found in those who screened positive for MDD [33]. The presence of impairments in physical functioning, limitations of role functioning due to poor physical health, physical pain, low vitality, and impaired social functioning in a population study of people with diabetes were each significantly associated with the presence of MDD [35]. Additionally, a survey of over 30,000 individuals found that functional disability was significantly more frequent among individuals with both diabetes and MDD than those with only one of the conditions [36]. Although the directionality of these effects is unclear from these studies, a longitudinal study of community-dwelling adults showed that while illness-related physical limitations predict changes in depressive symptoms over time, depressive symptoms do not predict similar changes in physical limitations. Additionally, part of the link between physical limitations and later increases in depression appears to be explained by the experience of pain and, to a lesser degree, by the experience of social stress [37]. A study of patients with diabetic peripheral neuropathy mapped specific pathways between disease-related factors such as neuropathy severity, neuropathy-related symptoms, impairment in daily activities, and neuropathy-related limitations in important roles and increases in depressive symptoms over time, reflecting the impact of diabetes-specific experiences on mood [38]. Finally, while epidemiological data have consistently linked MDD and physical illness, these mood-illness relationships have been found to diminish with age. When chronic illness occurs in younger adults, it is more strongly associated with MDD than if it develops in older age, where the experience of illness is normative and expected, illustrating how life context is crucial for understanding the relationship between illness and depression [39, 40]. These linkages between the experience of illness and the experience of depression provide an important context to consider in evaluating the abnormality of depressive symptoms. They also provide clues to potentially fruitful avenues of intervention that target depression by reducing the burden of illness (e.g., by improving coping and adaptation to changing roles). These illness-focused opportunities for intervention may be missed by the context neutral approach to diagnosing MDD.

Diabetes-Specific Distress

If we accept that the model of MDD for understanding the problem of depression in diabetes is lacking, then how are we to conceptualize the experience of subclinical depressive symptoms in many people living with diabetes? Can we improve our accounting of the often-close linkages between the experience of diabetes and the experience of emotional distress in patients? The construct of diabetes-specific

Table 2.2 Diabetes distress scale

DDS subscales (17 items total)	Example items
Emotional burden (5 items)	"Feeling angry, scared, and/or depressed when I think about living with diabetes"
Physician-related distress (4 items)	"Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes"
Regimen-related distress (5 items)	"Not feeling motivated to keep up my diabetes self-management"
Interpersonal distress (3 items)	"Feeling that friends or family are not supportive enough of self-care efforts (e.g., planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods)"

emotional distress addresses these questions. Diabetes distress is distinct from the concept of general emotional distress and was developed to specifically assess psychosocial adjustment in diabetes [41]. Diabetes-specific distress is also conceptually distinct from MDD; it is conceptualized as emotional distress that arises from living with diabetes and seen as a common psychosocial symptom of diabetes, predicated on a variety of medical, contextual, and individual factors, not on the presence of a psychiatric condition. Diabetes-specific distress can stem from a range of areas related to living with the burden of chronic illness. These may include difficult relationships with providers, feelings of failure, inadequacy or burnout related to keeping up with one's treatment regimen, conflict with family or friends due to one's illness, or frustration, anger, or sadness over living with diabetes [42]. Importantly, the concept of diabetes-specific distress is more closely aligned with patient views about the role of emotional distress in diabetes than the MDD comorbidity model. For example, results of a recent meta-synthesis of 22 qualitative studies addressing the co-occurrence of diabetes and depression found that patients associated diabetes with a variety of emotional reactions, including anger, shame, fear, shock, and guilt. Findings suggested that these emotional processes might more accurately be called diabetes-specific distress or diabetes-related demoralization than clinical depression [43].

Diabetes-specific distress – most commonly measured using the Problem Areas in Diabetes (PAID) [41] scale and the later Diabetes Distress Scale (DDS) (Tables 2.2 and 2.3) [42] – was uniquely associated with diabetes-specific outcomes and was an independent predictor of poorer diabetes self-care behavior [41]. When both structured clinical interviews for MDD and self-report questionnaires that measure diabetes-specific distress have been used, findings indicate that these measures tap into different constructs with their own independent associations with diabetes; diabetes-specific distress is closely associated with diabetes self-management and glycemic control, while MDD is not [30, 44]. Fisher and colleagues [44] found that diabetes-specific distress is linked to HbA1c both cross-sectionally and longitudinally, while MDD was not. They posit that HbA1c and diabetes-specific distress are related bidirectionally, in that they both influence each other over time. Patients with

Table 2.3 Self-report measures of diabetes-specific distress; the Problem Areas in Diabetes Scale (PAID) and the Diabetes Distress Scale (DDS)

Measure	Problem areas in diabetes (20 items)	Diabetes distress scale (17 items)
Domains	Diabetes-related emotional problems (12 items)	Emotional burden (5 items)
	Treatment problems (3)	Physician-related distress (4 items)
	Food-related problems (3)	Regimen-related distress (5 items)
	Social support-related problems (2)	Interpersonal distress (3 items)

poor glycemic control may then experience distress, which could lead to sustained poor disease management. Conversely, patients experiencing significant diabetes-specific distress may be less likely to practice self-care behaviors, which could then negatively impact their HbA1c level.

While findings have consistently shown that diabetes-specific distress is more closely associated with diabetes self-management than MDD, studies that have investigated independent relationships between diabetes distress and depressive symptoms on the one hand and diabetes self-management on the other have provided a somewhat different picture. In a cross-sectional evaluation of a large primary care sample of people with type 2 diabetes, a continuous measure of depressive symptom severity was more closely associated with poorer diabetes self-management than the PAID in multivariate models. This remained true even when those who screened positive for MDD were removed from the analysis [45]. Similarly, Lloyd and colleagues showed that CES-D score was a better independent predictor of physical activity than PAID scores in patients with type 1 diabetes [46]. Although these results may appear to contradict the idea that diabetes-specific distress accounts for the relationship between depression and diabetes self-management, caution should be used in drawing conclusions about the relative importance of the constructs of depression and diabetes-specific distress from these findings. There is substantial overlap in the measures of these constructs. For example, scores on a DSM-IV-based screener for MDD and PAID scores shared 29% of their variance in the study by Gonzalez and colleagues [45]. CES-D scores and PAID scores share 24% of their variance, and CES-D scores and DDS total scores share approximately 23% of their variance [30, 46]. This shared variance may be equally important as the unique variance in each measure but is eliminated from multiple regression analyses. More importantly, although researchers may conceptualize measures of depression as distinct from measures of diabetes-specific distress, respondents are unlikely to make such a distinction. There is no reason to believe that high scores on depression symptom measures, which contain items that reflect a more severe level of emotional distress and functional impairment than those on the PAID or DDS, could not represent distress that is caused by diabetes (as discussed above). Thus, disentangling these constructs is exceedingly difficult.

A recent study clearly demonstrates how the context of diabetes can have a causal influence on ratings of depression severity. A qualitative analysis of transcripts of structured clinical interviews for depression symptom severity, administered by a trained clinician to 34 adults with type 1 diabetes, revealed that nearly three-fourths of participants who reported symptoms of depression discussed these symptoms

within a diabetes-specific context, which was indicative of either diabetes-specific distress or depressive-like symptoms (e.g., appetite, sleep, or concentration disturbances) more likely due to diabetes and effects of high or low blood sugars [47]. The diabetes-specific distress content expressed by participants during the interview fell into areas related to negative emotional reactions (e.g., anger, frustration, anxiety, depression) to high glucometer readings, feeling overwhelmed by diabetes, being upset about weight gain thought to be associated with insulin use, and guilt over burdening others with one's illness. Thus, even the gold standard of depression assessment, a structured clinical interview administered by a trained professional, may be vulnerable to influence by diabetes-specific distress. It is unknown how diabetes distress influences likelihood of misdiagnosing distress as a psychiatric disorder, but findings from this study point to the strong possibility that the presence of diabetes-specific distress complicates the assessment of MDD. Not attending to diabetes as a context, and distress that arises specifically from living with diabetes during depression assessment, could lead to an overdiagnosis of MDD or missing the presence of distress that is secondary to living with the burden of a chronic illness. These errors have implications for the selection of appropriate treatments. Before we turn to these implications, we first briefly review psychometric properties of diabetes distress measures.

Screening for Diabetes-Specific Distress

Several measures have been created to assess different aspects of diabetes-specific distress. In addition to the PAID and the DDS, these include the 39-item ATT39, which measures emotional adjustment in patients with diabetes [48], and the 45-item Questionnaire on Stress in Patients with Diabetes-Revised (QSD-R, [49]), which contains subscales that assess different potential stressful areas of living with diabetes, including leisure time, depression/fear of future, hypoglycemia, treatment regimen/diet, physical complaints, work, partner, and doctor-patient relationship [50]. In addition, the diabetes version of the Illness Perceptions Questionnaire, a self-report measure based on Leventhal's self-regulatory model of health beliefs assessing perception of illness across the domains of identity, causality, timeline, consequences, and curability/controllability, has a subscale for emotional representations of diabetes [51].

The Problem Areas in Diabetes (PAID) scale and the more recent Diabetes Distress Scale (DDS) are the most widely used measures of diabetes-specific distress [41, 42]. The PAID is a 20-item self-report instrument developed to measure diabetes-specific emotional distress across areas ranging from emotional and interpersonal distress to struggles with the diabetes management regimen [41]. It uses a 5-point Likert scale format to assess the degree to which diabetes management and/or feelings about diabetes are problematic to patients, with responses ranging from "not a problem" to a "serious problem." Initially developed in English at the Joslin Diabetes Center, Boston, USA, from data collected from diabetes health care providers and patients with diabetes, it has been translated into Spanish, Japanese,

Dutch, German, Chinese, Croatian, Danish, and Portuguese [52–54]. It was developed to aid health care providers in collaborating with patients and is primarily used to assess distress and monitor patient change. A cutoff score of 40 has been recommended to denote elevated levels of distress, with a score of 50 denoting seriously elevated distress [46, 55, 56].

While the PAID was originally developed without subscales, Snoek and colleagues [54] found that a four-factor model comprised of subscales representing diabetes-related emotional problems (12 items), treatment problems (3 items), food-related problems (3 items), and social support-related problems (2 items) presented the best fit for data from a sample of 1,696 participants from the Netherlands and the USA [54]. However, this four-factor structure has not held up in several attempts to validate international versions of the PAID, such as the Chinese [57] and Norwegian [58] versions. Additionally, a two-factor structure was found in the Turkish [59] version of the PAID (a 5-item "support-related issues" factor and a 15-item "diabetes-distress" factor), and a 7-item "lack of confidence" subscale and a 13-item "negative emotional consequences" subscale were uncovered in an investigation of the psychometric properties of the PAID among rural, African-American women [60]. Cultural variability has been suggested as a likely explanation for this variation, and an important consideration overall in the assessment of diabetes-specific distress [58, 60].

The PAID has been found to have consistently high internal reliability, good item-to-total correlations, sound 2-month test–retest reliability, and to correlate strongly with constructs it would be expected to be associated with, such as emotional distress, depression, disordered eating, fear of hypoglycemia, HbA1C, diabetes complications, and activities of diabetes self-care [41, 61]. It has not been associated with length of diabetes, education, or ethnicity, although it is negatively associated with age [41, 62, 63]. Findings regarding the relationship between diabetes-specific distress and gender have been mixed [54]. In a survey of 815 primary care patients with type 2 diabetes, patients treated with insulin evidenced higher diabetes distress on the PAID as compared with patients on a diet or oral medication treatment regimen [64]. McGuire and colleagues [65] identified two psychometrically robust short-form measures of diabetes-specific emotional distress: a reliable and brief 5-item version of the PAID (PAID-5) with good sensitivity (94%) and specificity (89%) for the recognition of diabetes-specific emotional distress and a single-item screening question ("worrying about the future and the possibility of serious complications"), the PAID-1, possessing concurrent sensitivity and specificity of 80%.

In a comparison of different measures of depression assessment among diabetes patients, including self-report measures, a structured clinical interview, a nonstructured clinical interview including psychiatric history, and a measure of diabetes-specific distress, the PAID showed superior ability to detect both clinical and subclinical depression, as well as diabetes-related distress when compared to standard measures of assessment for depression alone [55]. Higher scores on certain PAID items that reflect feelings of burnout from diabetes management and feeling depressed about diabetes were more strongly related to clinical depression, reflecting the need for targeted assessment of depression as well as diabetes-specific distress. Shortcomings

of the PAID include its length and the criticism that it does not fully address diabetes distress related to patients' attitudes toward their diabetes care providers [42].

Due to these limitations of the PAID, Polonsky et al. [42] created the Diabetes Distress Scale (DDS), a 17-item measure of diabetes-specific distress that contains four subscales: emotional burden, physician-related distress, regimen-related distress, and interpersonal distress. Like the PAID, the DDS was developed with provider and patient feedback in mind; unlike the PAID, the four subscales were chosen a priori, reflecting a core conceptual stance regarding key domains of diabetes-specific distress [42]. The DDS-17 provides a total score plus 4 subscale scores. A mean score of 3 or higher has been considered moderate distress and has been used to discriminate low-distress groups from those worthy of clinical attention. Fisher and colleagues later determined more specific cutoff categories, with a mean score under 2 indicating "little or no" diabetes distress, a mean score between 2 and 2.9 indicating "moderate" diabetes distress, and a score of 3 or higher indicating "high" diabetes distress [66]. This study found increases in diabetes distress as measured by the DDS-17 to be associated with higher HbA1c, lower self-efficacy, less physical activity, and poorer diet [66].

A brief review of its psychometric properties reveals a consistent, generalizable factor structure and adequate internal reliability and validity across the four subscales ($\alpha > 0.87$) [42]. It is suggested that health care providers review the DDS-17 with the patient regardless of scores as part of a comprehensive diabetes assessment [42]. A brief 2-item diabetes distress screen based on the DDS-17 was developed by Fisher and colleagues [67], and the DDS-2 was found to have similar cutoff scores as the DDS-17 [66]. The DDS-2 is comprised of the items "feeling overwhelmed by the demands of living with diabetes" and "feeling that I am often failing with my diabetes regimen," which respondents rate on a 6-point scale. It displayed high levels of sensitivity and specificity, .95 and .85, respectively, with an accuracy rate (true positive) of 96.7% when measured against the benchmark of the DDS-17 [67]. Despite the brevity of the DDS-2, a recent examination by Fisher and colleagues of its psychometric properties found that it classified participants into categories of diabetes-specific distress similarly to the full DDS-17; a score <2 indicated little or no distress, moderate diabetes distress fell between 2 and 2.9, and ≥3 indicated high levels of diabetes distress [66]. As even relatively low levels of distress have been associated with poorer diabetes outcomes, a DDS-2 of >2 (average of the 2 items) may warrant further investigation of the patient's diabetes-specific distress, including more comprehensive assessment via administration of the DDS-17.

Where Do We Go from Here? Clinical Implications for Screening in Medical and Mental Health Settings

The importance of assessing emotional well-being and quality of life as part of the medical management of diabetes is reflected in statements from the American Diabetes Association (ADA) and International Diabetes Federation (IDF) [68, 69].

The ADA recommends that psychosocial screening take place both at sentinel moments in diabetes care, such as at diagnosis, discovery of complications, hospitalization, or problems in control or self-management, as well as part of regular follow-up. The current challenges of accurately assessing diabetes-specific distress, clinically significant depressive symptoms, and MDD should not deter us from improving how we assess and address the common experience of emotional distress in individuals living with diabetes as a component of comprehensive diabetes care. Without adequate assessment, identifying patients with depressive symptoms or diabetes-specific distress may not be clear, even among highly trained health care professionals. For example, in a study by Pouwer and colleagues [70], diabetes nurse specialists failed to recognize depression and diabetes-specific emotional distress in three-fourths of patients with high scores on the Hospital Anxiety and Depression Scale (HADS) or PAID scale. This finding demonstrates a disconnect between distress and depressive symptoms disclosed by diabetes patients via self-report compared to how they may present in the time-limited, medically oriented setting of a medical visit.

Distinguishing between MDD and diabetes distress in patients with diabetes is a necessary step to ensure appropriate treatment referrals and decisions following an elevated score on one of the several self-report tools used to identify distressed patients in clinical settings. The use of a screening methodology that results in a high rate of false-positives for MDD among patients with diabetes presents challenges to treatment planning and intervention. Roy et al. [24] point out that self-report tools should be used only as a first step to screen for symptoms that could then lead to a clinical interview. Misidentifying distressed patients with diabetes as having MDD could lead to prescribing antidepressants, which may not lead to improvement in symptoms, since they do not appear to be more effective than placebo for mild or subclinical presentations of MDD [71]. Certainly, additional targeted differential diagnosis by a trained mental health provider would be needed to confirm or disconfirm an MDD diagnosis [72]. In the current health care system, MDD and other psychiatric disorders are often treated outside of the medical context by mental health specialists who may not be well versed in the complexities of life with diabetes. This has obvious disadvantages for treatment if we accept that distress and diabetes are often causally and bidirectionally linked.

Diabetes-specific distress and subclinical depressive symptoms should be evaluated in light of the context presented by their experience with diabetes and should be screened for as part of comprehensive diabetes care. More appropriate treatment for patients with diabetes-specific distress could be targeted toward assisting patients in better managing their treatment regimen, providing peer support from others with diabetes, and additional education/guidance or encouragement in order to optimize their care and integrate mental health into disease management.

Treating the significant numbers of distressed diabetes patients within the diabetes care environment (as opposed to referring them out to separate mental health services) allows providers to have maximal impact on their patient's well-being through comprehensive, psychosocially sophisticated care [73]. Despite the importance of screening for diabetes-specific distress, the majority of literature portrays

the use of the PAID and the DDS as part of the collection of descriptive or outcome data in research studies as opposed to practical tools integrated in clinical settings [44, 74]. Although there is a dearth of translational research on how to best utilize these screening tools in the practice arena, we offer some suggestions based on the diabetes-specific distress and integrative primary care literature.

For screening of diabetes-specific distress to be useful to patients and providers, it should fit into the flow of the visit and not significantly increase provider burden [75]. How to incorporate self-report measures into a time-limited visit is an important consideration. Screening is of little use if providers do not know how to use screening results in a way that improves the efficacy of the care they provide. Furthermore, medical providers may be wary of assessing affectively laden issues such as the burden of living with diabetes for fear that it will lead them into complex emotional or behavioral areas that cannot be addressed within the limits of their visit. However, talking openly about the distress related to the challenge of diabetes does not require special mental health training; empathic listening, engagement in thoughtful and supportive dialogue, and the use of reflective comments are important skills for all members of the health care team [73]. Understanding emotional distress within the context of the patient's experience of managing their diabetes supports interventions that target challenges in diabetes self-regulation, including maladaptive beliefs about diabetes or avoidance of diabetes-specific behaviors such as self-care due to illness-specific emotional distress. Incorporating emotional and behavioral management into diabetes care may be more effective and better received than approaches that focus solely on decreasing emotional symptoms without acknowledging the diabetes-relevant issues that underlie mood symptoms or the widespread approach of providing diabetes education without acknowledging the psychosocial factors that impact on the understanding and incorporation of medical information [76].

If a comprehensive approach to diabetes is to be feasible, health care providers must also have access to appropriate referrals, resources, and education; if assessment of depression or diabetes-specific distress is to occur as part of normal diabetes care, providers must feel confident that they know what to do with positive screens for MDD or diabetes-specific distress. Glasgow and colleagues [75, 77] discuss methods for translating behavior change research into primary care practice and suggest utilizing the 5 A's Behavior Change Model (Assess, Advise, Agree, Assist, and Arrange) when integrating behavioral health interventions into practice and emphasize the interdependence of these steps on each other. In the case of screening for diabetes-specific distress, assessment should be effectively integrated into the visit to maximize the value of the screen (Assess). The provider can use feedback from the assessment to target appropriate interventions based on the specific nature of the patient's distress (Advise). The patient and provider can then collaborate to set specific, measurable diabetes-specific goals and assist them in deciding on a course of action (Agree). They can assist patients by helping them to implement their goals through planning and problem-solving strategies (Assist), provide appropriate referrals, and can help arrange supports for the patient via follow-up care, following up with referrals, and ongoing assessment and intervention

(Arrange). More specific suggestions for integrating empirically validated assessment into primary care include using all the resources of a primary care practice to provide comprehensive patient care, including utilizing waiting room time for completing brief self-report assessments [75, 77]. Making data on diabetes-specific distress available prior to the start of encounters in the same manner as BMI or blood pressure readings may allow the provider a quick snapshot of their patients' adjustment to their illness allowing them to provide feedback on the patients' responses and incorporate a discussion about problem areas into the flow of the visit.

To our knowledge, no data exists that supports the use of brief self-report measures of diabetes-specific distress over an ongoing clinical conversation in which the provider addresses the patient's emotional, social, medical, and functional experience of diabetes and how they influence their self-management. By openly discussing nonpsychiatric distress in the context of diabetes, such a conversation can build trust and collaboration between the patient and provider and avoid the false-positives or pathologizing of common emotional symptoms that may result from the use of screeners geared toward detecting MDD. Conversations between patients and providers about distress may facilitate the introduction of brief interventions, such as identifying realistic goals or collaborating in problem-solving. They can also serve as opportunities for continued evaluation of the possible presence of more severe psychiatric conditions, such as MDD. Having their emotional experience of dealing with diabetes normalized by their physician or nurse can be therapeutic and foster patient engagement with their diabetes care [72]. As levels of distress may vary over time, evaluating diabetes distress should be an ongoing process with follow-up across visits, and easy access to this information in patient records increases the likelihood that these symptoms will continue to be addressed over time.

Summary

It is suggested that the modern diagnostic system for MDD, with its operational approach to assessment, overlooks the life context in which symptoms occur and leads to the overapplication of the MDD comorbidity model to the problem of distress in diabetes. While this approach may improve the reliability of diagnosis, it sacrifices ecological validity and can be particularly problematic in treating patients with diabetes, as the co-occurrence of diabetes-specific distress or subclinical depressive symptoms have been related to diabetes self-management above and beyond the presence of MDD. Individuals with diabetes presenting with depressive mood symptoms or distress specifically related to their lived experience with diabetes may be misclassified as having MDD, especially when self-report measures are used. MDD may be overdiagnosed among patients with diabetes at the expense of accurately capturing patients' experience of diabetes-specific distress. Further study dedicated to disentangling the relationship between distress specific to the burden of chronic illness and the clinical implication of comorbid MDD and diabetes is necessary, as is more rigorous and targeted use of structured clinical interviews and

well-selected screening tools. In light of their relationship to diabetes self-care and health outcomes and greater prevalence than MDD, we suggest that health professionals (and patients) may be better served by assessing for distress and depressive symptoms overall and for MDD. Much work has yet to be done in developing best practices for assessing diabetes distress and developing appropriate treatment and follow-up plans within the context of an often overburdened health care system. The prevalence of distress and depressive symptoms among adults living with diabetes and the impact on self-care and medical outcomes present both a challenge and opportunity for collaborative, comprehensive, and integrative care of diabetes.

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http://www.springer.com/978-0-85729-750-1

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A Practical Guide

Lloyd, C.E.; Pouwer, F.; Hermanns, N. (Eds.)

2013, XVIII, 220 p. 7 illus., 6 illus. in color., Softcover
ISBN: 978-0-85729-750-1