CHARACTERIZATION OF DIABETES DISTRESS: ASSESSING DEMOGRAPHIC, CLINICAL, BEHAVIORAL, AND PSYCHOSOCIAL CORRELATES

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Introduction

Diabetes, a group of complex metabolic diseases[1,2] encompassing type 1 diabetes (T1D), type 2 diabetes (T2D), and other subtypes, is estimated to affect 10.5% of the U.S. population.[3] Characterized by hyperglycemia,[1] diabetes requires complex self-care practices to ensure proper glycemic control.[4,5] However, suboptimal levels of glycemic control are common among diabetic patients.[6-8] Additionally, extensive literature has shown the influence of psychosocial factors on the adherence to self-management behaviors in diabetes[7,8]–with depressive symptoms found to be associated with suboptimal self-care practices and poor clinical outcomes.[9-13]

Diabetes distress, or the emotional burden that accompanies diabetes and its demanding self-care behaviors,[4,13] represents a large barrier to the proper management of diabetes due to its association with suboptimal health-related outcomes.[14] Distinct from clinical depression, diabetes distress is not a psychiatric disorder, but instead is the emotional reaction to managing diabetes.[11] Glycated hemoglobin (HbA1c) level, an indicator of glycemic control, has been shown to be more closely linked to diabetes distress than to depressive symptoms in diabetic adults and adolescents.[15,16] The prevalence of diabetes distress has been highlighted by several studies.[17-20] In the second Diabetes Attitudes, Wishes and Needs study (DAWN2), a cross-national study involving 17 countries, 44.6% of people with diabetes reported experiencing diabetes distress.[20] The demonstrated prevalence of diabetes distress and its association with substandard self-care practices and glycemic control illustrate its high clinical importance.

Although the clinical significance of diabetes distress has been established, a study examining the use of diabetes distress screening methods among endocrinologists and diabetes educators in Canadian clinics demonstrated that very few health care providers (HCPs) utilized diabetes distress questionnaires.[21] Furthermore, when depressive symptoms of diabetic patients are assessed by HCPs, certain measures, such as the Center for Epidemiological Studies Depression Scale (CESD),[22] can often misdiagnose diabetes distress as depression–resulting in inadequate treatment.[11,22] In fact, previous studies have indicated that a majority of diabetic patients with comorbid depressive symptoms do not have clinical depression, but instead are burdened with high levels of diabetes distress.[18,22]

Due to the prevalence of diabetes distress, its demonstrated significance, and its lack of adequate current assessment in a clinical setting, there is a need to identify the factors associated with this condition. While previous literature has suggested the relationship between diabetes distress and several demographic, clinical, psychosocial, and behavioral measures, there is a lack of extensive reviews that summarize such findings. This review provides a comprehensive and up-to-date overview of the factors associated with diabetes distress for use in its proper identification and subsequent intervention. The predictors of diabetes distress will be assessed using several factors:

demographic and clinical factors, including sex, age, socioeconomic status (SES), and HbA1c level; behavioral factors, including various self-care practices; and psychosocial factors, including psychological health concerns, self-efficacy, and social support.

Demographic and Clinical Factors Associated with Diabetes Distress

Several demographic and health-related variables have been associated with diabetes distress. With respect to demographic variables, sex,[2,13,14,18,23] age,[18,23,24] and SES[14,25] represent potential predictors of diabetes distress. Meanwhile, a clinical factor strongly linked to diabetes distress is HbA1c level.[14,15,23,27-30]

Female sex was identified as a predictor of diabetes distress in several studies.[2,13,14,18,23] In a retrospective cohort study assessing the long-term patterns and predictors of chronic diabetes distress among adolescents, Iturralde et al. identified sex as a demographic variable related to diabetes distress.[13] Using the 26-item Problem Areas in Diabetes-Teen version (PAID-T) scale, researchers classified adolescents into four groups: low diabetes distress, improving diabetes distress, stable moderate diabetes distress, and stable high diabetes distress.[13] Researchers found that females were three times more likely than males to have stable high diabetes distress, while those with low diabetes distress were more likely to be male than female.[13] In adults, a similar association between female sex and diabetes distress has been demonstrated.[2,14,18,23] From these studies, female sex emerges as a predictor of diabetes distress in adolescents and adults.

Younger age[18,23,24] and lower SES[14,25] represent additional predictors of diabetes distress. In a cross-sectional study that evaluated factors associated with diabetes distress, Wardian and Sun identified younger age as a predictor of this condition.[24] Data was collected from 267 adults with T2D who completed the Diabetes Distress Scale (DDS).[24] Researchers found that younger age was significantly associated with higher diabetes distress.[24] Lower SES has also been identified as a correlate of diabetes distress.[14] In a nationwide German cohort study evaluating the relationship between diabetes distress and health-related measures, Stahl-Pehe et al. demonstrated an association between high diabetes distress and low SES.[14] Using a sample of young adults and adolescents with early onset T1D, researchers collected demographic data and assessed diabetes distress using the Problem Areas in Diabetes (PAID) scale.[14] Through cross-sectional analysis, researchers found that higher PAID scores were associated with lower SES.[14]

Elevated HbA1c level is a clinical factor strongly associated with diabetes distress.[14,15,23,27-30] As a measure of blood glucose concentration, HbA1c level is not only an indicator of glycemic control, but also predicts the risk of future diabetes complications.[26] Therefore, the significant association between high diabetes distress and elevated HbA1c level–demonstrated in both adolescents[14,27,29] and adults[14,15,23,27,28,30]–is concerning. Given the well-demonstrated relationship between HbA1c level and diabetes distress, HbA1c level can be conclusively identified as a correlate of diabetes distress.

Behavioral Factors Associated with Diabetes Distress

Multiple behavioral factors associated with diabetes distress have been identified. Self-care behaviors, including taking medication, following a healthy diet, engaging in physical activity,

checking blood glucose, and problem-solving, are required to ensure proper glycemic control.[4] However, poor self-management, involving less frequent self-care behaviors and poorer problem-solving or coping strategies, has been linked to diabetes distress in several studies.[13,15,23,24,28]

In a previously referenced study by Iturralde et al., researchers identified several behavioral factors associated with diabetes distress in adolescents.[13] In this study, adherence to self-care tasks, including monitoring blood glucose levels, regulating insulin and food intake, and engaging in physical activity, was assessed by the Self-Care Inventory (SCI).[13] Researchers found that greater adherence to self-care practices was present among those with improving low diabetes distress.[13] Meanwhile, those with stable high diabetes distress were found to take part in self-care behaviors less often and possess poorer problem-solving and coping strategies.[13] Furthermore, in an additional study by Iturralde et al., results of a randomized control trial involving 264 adolescents with T1D demonstrated that higher diabetes distress was associated with greater use of avoidant coping style–a poor form of coping that involves putting off attempts to solve a problem.[28] Additionally, researchers found that higher diabetes distress was associated with less frequent blood glucose checks and self-care practices.[28]

Similar results regarding the relationship between adherence to self-care behaviors and diabetes distress have been found in adult patients. In a retrospective cohort study analyzing the data of 2,374 patients with T2D from the Benchmarking Network for Clinical and Humanistic Outcomes in Diabetes (BENCH-D) study in Italy, Pintaudi et al. found that those with high diabetes distress (PAID score ≥ 40) participated in self-care activities less often.[23] In addition, Wardian and Sun found that low diabetes distress was correlated with greater adherence to a healthy diet.[24] Further support for the association between high diabetes distress and less adherence to self-care practices was provided by a comparative study by Asuzu et al.[15] In this study of 615 adults with T2D, researchers found a significant association between high diabetes distress and suboptimal self-care practices.[15]

Psychosocial Factors Associated with Diabetes Distress

A multitude of psychosocial factors have been linked to diabetes distress. Such factors, including psychological health concerns, self-efficacy, and social support, have been identified by several studies. Psychological health concerns, encompassing depressive and anxious symptoms, poor satisfaction with life, and eating and weight concerns, have been shown to complicate the self-management of diabetes.[27] At the same time, self-efficacy–the belief that one can successfully manage one's own health–and social support have been shown to mitigate the effects of distress.[23,24,28]

Poor psychological health concerns and low levels of self-efficacy have been identified as predictors of high diabetes distress. In a retrospective study, Powers et al. identified several psychosocial correlates of diabetes distress.[27] In this study, the data from 268 adolescents and young adults with T1D who took the 2-item Diabetes Distress Screening Scale (DDS2) and various instruments assessing psychological health concerns was used.[27] To analyze collected data, the scores for each subscale were evaluated within two age groups (adolescents and young adults).[27] In both adolescents and young adults, higher levels of diabetes distress were correlated with depressive

symptoms and concerns regarding diet and weight.[27] In addition, higher levels of diabetes distress among adolescents were correlated with lower scores for self-image and self-efficacy and higher scores for dietary restraint.[27] Overall, researchers found that those with high diabetes distress reported poorer psychological health concerns and lower self-efficacy than those with moderate to low diabetes distress.[27]

Additional studies have shown similar findings. In addition to aforementioned behavioral and clinical factors, Iturralde et al. identified various psychosocial factors, including elevated psychological distress and depressive and anxious symptoms, associated with stable high diabetes distress.[13] Furthermore, Stahl-Pehe et al. found that lower PAID scores–indicating a lower level of diabetes distress–were present in those with better mental health.[14]

A low level of perceived social support represents another predictor of diabetes distress.[23,24,28] In an Italian cohort study, Indelicato et al. assessed the connection between diabetes distress, glycemic control, and various psychological factors relating to diabetes.[28] In this study, 172 adults with T2D received a medical assessment and completed various questionnaires assessing depression, anxiety, and psychological factors related to diabetes.[28] Psychological factors, including self-efficacy and social support, were assessed using the Multidimensional Diabetes Questionnaire (MDQ).[28] Researchers found that those with high diabetes distress possessed lower self-efficacy and social support from family, friends, and HCPs.[28] Similarly, Pintaudi et al. found that patients with high diabetes distress had lower levels of self-assessed social support, as well as a lower psychological well-being index.[23] In addition, the aforementioned study by Wardian and Sun specifically identified level of physician-related support as a factor linked to diabetes distress.[24] In this study, researchers found that low diabetes distress was correlated with higher self-efficacy and more support from HCPs.[24]

Conclusion

Female sex, [2,13,14,18,23] younger age, [18,23,24] lower SES,[14,25] and higher HbA1c level[14,15,23,27-30] represent potential predictors of diabetes distress. The vulnerability of females to diabetes distress is congruent with larger sex-related differences regarding the prevalence of affective disorders.[31] Younger diabetic individuals may have additional life stressors regarding school, work, or financial challenges that increase their susceptibility to experiencing diabetes distress.[24] Diabetic patients with low SES–a population disproportionately affected by the complications of diabetes[32]–represent another group at risk for high diabetes distress. As either the cause or result of diabetes distress, elevated HbA1c levels represent a strong predictor of this condition. Previously referenced studies that demonstrate the relationship between diabetes distress and poor glycemic control highlight the importance of addressing diabetes distress in a clinical setting. Additionally, given the association between these two variables, HbA1c levels can potentially help HCPs predict a patient's vulnerability to experiencing diabetes distress. These aforementioned findings indicate that screening and interventions for diabetes distress should be directed toward younger individuals and women with low SES and elevated HbA1c levels.

Poor self-management of diabetes, encompassing low adherence to self-care behaviors and poor problem-solving or coping strategies, has been found to be a behavioral factor associated with

diabetes distress.[13,15,23,24,28] However, whether poor self-management contributes to or is the result of diabetes distress in diabetic patients remains relatively unclear. Nevertheless, low adherence to self-care behaviors and poor strategies to deal with diabetes self-management result in suboptimal glycemic control. Therefore, HCPs should work to promote adherence to self-care behaviors and improve problem-solving and coping strategies in diabetic patients to enhance glycemic control and potentially target diabetes distress.

Psychosocial factors, including poor psychological health concerns, low self-efficacy, and lack of social support, have been identified as additional predictors of diabetes distress.[13,14,23,24,27,28] Patients with poor psychological health concerns, including depressive and anxious symptoms, poor satisfaction with life, and eating and weight concerns, represent a population at increased risk for experiencing diabetes distress. In addition to patients with poor psychological health concerns, those with low self-efficacy or social support may be especially vulnerable to experiencing diabetes distress. Due to the lack of necessary confidence or sufficient support required for proper management of a demanding chronic condition, patients with low self-efficacy or social support may be less likely to engage in diabetes self-management.[24] HCPs may therefore want to target improving psychological health concerns and increasing social support and self-efficacy in patients with diabetes. Additionally, due to the demonstrated significance of physician-related support in reducing diabetes distress, HCPs can work to improve the quality of their provider-patient relationships to target diabetes distress.

As a widely prevalent[17-20]–yet often underdiagnosed–condition associated with suboptimal diabetes outcomes, diabetes distress holds high importance in a clinical setting. Due to the significance of diabetes distress, this review identified the factors associated with this condition. By summarizing demographic, clinical, behavioral, and psychosocial factors associated with diabetes distress, this review provides a comprehensive and timely overview of the correlates of diabetes distress for use in a clinical setting. Overall, proper identification and intervention of diabetes distress is necessary to improve health-related outcomes and psychological well-being of diabetic patients. The findings of this review help to identify those at most risk for diabetes distress for the development of targeted screening methods. Furthermore, by identifying preventable factors associated with diabetes distress, this review helps to clarify where interventions for diabetes distress should focus. Future research concerning diabetes distress should seek to further verify the aforementioned correlates of this condition. Additionally, the efficacy of targeted screening and interventions for diabetes distress recommended by this review should be assessed by further research.

Emma Carpenter recently graduated from the University of Florida with a B.S. in biology and a minor in health disparities in society. Emma is pursuing a career in medicine where she aspires to provide compassionate, patient-centered health care. Emma hopes that her medical review can help raise awareness of diabetes distress and inform others of the factors associated with this condition.

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