

# Diabetes-specific emotional discomfort, sadness, anxiety, and general well-being are related to HbA1c in adults with type 1 diabetes

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## Abstract

**Objective:** Adults with diabetes frequently experience emotional difficulties, and it is necessary to be aware of how various indicators of emotional difficulties relate to glycemic control. The objective was to investigate the connections between glycosylated hemoglobin (HbA1c), diabetes-specific emotional distress, depression, and anxiety, and overall well-being.

**Methods:** The Diabetes Distress Scale, the Problem Areas in Diabetes Survey, the Hospital Anxiety and Depression Scale, and the World Health Organization-Five Well-Being Index were all completed by 235 (74 percent) of the 319 adults with type 1 diabetes who were attending the endocrinology outpatient clinic at a university hospital in Norway. To determine HbA1c, blood samples were taken at the time of data collection. Diabetes-specific emotional distress, anxiety, depression, and overall well-being were all found to be associated with HbA1c in regression analyses. Nonlinearity in the relationship between HbA1c and diabetes-specific emotional distress was investigated.

**Results:** Glycemic control was linked to diabetes-specific emotional distress (DDS total:  $P = .001$ , unstandardized coefficient = 0.038; Total PAID: depression, anxiety, and general well-being were not (coefficient = 0.021,  $P = .007$ ). On the DDS, just routine related trouble was autonomously connected with HbA1c (coefficient = 0.056,  $P < .001$ ). A difference of 0.6 in HbA1c is associated with a difference in baseline regimen distress of 0.5 standard deviation. The relationship between diabetes-specific distress and HbA1c was not significantly nonlinear.

**Conclusions:** Health care providers should distinguish between depression and diabetes-specific emotional distress in clinical consultations to encourage appropriate care strategies. Glycemic control may be improved by addressing emotional distress associated with diabetes, particularly regimen distress, during clinical consultation.

**Keywords:** Depression; Anxiety; Diabetes-specific emotional distress; HbA1c; Type 1 diabetes

## Introduction

Type 1 diabetes is a long-term condition in which the beta cells of the pancreas that make insulin are destroyed. As a result, exogenous insulin replacement therapy is required for the rest of one's life. Diabetes is a growing problem for public health all over the world, with consequences for

people's daily lives and a significant financial burden on society. To prevent later complications of diabetes, such as diabetic retinopathy, nephropathy, and neuropathy, it is essential to maintain an appropriate glycemic control [1]. The American Diabetes Association rules suggest that people with type 1 diabetes ought to have a HbA1c level of  $< 7\%$ . Many people do not adhere to the treatment recommendation, despite the growing body of knowledge regarding factors that could improve glycemic control. Emotional issues may limit a person's ability to manage the self-care activities necessary to maintain adequate glycemic control and make the required self-management of the disease more difficult. Emotional issues are a challenge that concerns people with diabetes across cultures, as the most recent DAWN2 study demonstrated. In addition, it was reported that, despite the fact that health care providers acknowledged the significance of addressing emotional issues in diabetics, there was a discrepancy between the requirements of individuals and the strategies that are currently utilized in health care [2].

In people with type 1 diabetes, the presence of depression or diabetes-specific emotional distress, or a combination of these, may impede adequate self-management. Depression, anxiety, and diabetes-specific emotional distress have all been reported to be underrecognized, and even in patients whose issues are directly related to diabetes and its treatment, when such concerns are recognized, they may be mistaken for depression. Diabetes-explicit close to home pain can be characterized as a scope of profound reactions and responses to existence with diabetes, particularly those connected with the treatment routine and taking care of oneself requests [3]. It is a part of a person's experience with diabetes management and treatment in the social context of their family and healthcare providers. In contrast, anxiety is primarily associated with fear, worry, and dread, while depression is more strongly linked to an anhedonic state, in which an individual is markedly affected by feelings of sorrow and hopelessness [4].

Gonzales and co. proposed that type 2 diabetes-specific emotional distress and depression are distinct constructs, and later suggested that there may be confusion regarding what is actually addressed. Hermanns and others demonstrated that, despite some overlap, patients with type 1 or type 2 diabetes did not belong to the same groups as those with depression or diabetes-specific emotional distress [5]. It has been demonstrated that diabetes-specific emotional distress and depression have distinct associations with diabetes-specific indicators but this is primarily examined in type 2 diabetics.

Fisher and others In two samples of people with type 2 diabetes, [6] discovered nonlinear relationships of diabetes-specific emotional distress with HbA1c, diet, self-efficacy, and physical activity, with stronger relationships for lower levels of diabetes-specific emotional distress. The authors suggested that distress should be recognized at a lower level than was previously suggested. They also suggested that the significant nonlinear relationship between the DDS scores and the three groups—low, moderate, and high distress—would be better accommodated [7]. Little information about a potential nonlinear affiliation is accessible in people with type 1 diabetes, and it isn't proper to expect that profound issues are comparatively showed and have similar clinical results in people with type 1 and type 2 diabetes. Therefore, the primary objective of this study was to investigate whether there is a nonlinear relationship between HbA1c and diabetes-related emotional distress in type 1 diabetics and the overall well-being, anxiety, and depression that are associated with diabetes [8].

## Materials and Methods

### Test and settings

Of the 319 people with type 1 diabetes, matured 18-69 years, going to a

grown-up short term center between October 2008 and January 2009 who were welcome to take part in this review, 235 people consented to take part (74%). Some data was accessible to contrast members and nonparticipants: age (39.0 years old and 37.9 years old, respectively;  $P = .535$ ), gender distribution (male 57% versus 66%;  $P = .244$ ) and HbA1c level (8.1% (65 mmol/mol) versus 8.4% (68 mmol/mol), separately;  $P = .285$ ). Blood samples were taken at the time of data collection and analyzed with a DCA-2000 Analyzer (Bayer, Elkhart, IN, USA) to determine HbA1c levels.

## Results

### Linear regression

The bivariate regression analysis revealed a significant relationship between the following variables and HbA1c. Total scores for the DDS and PAID (unstandardized coefficients of 0.020,  $P = .001$ , and 0.033,  $P.001$ , respectively); DDS subscales for regimen-related distress and emotional burden (0.039,  $P.001$  and 0.014,  $P = .005$ , respectively); WHO-5, HADS-A, and HADS-D weren't. In addition, a higher HbA1c was significantly correlated with the presence of one or more late complications (0.621,  $P = .010$ ) and a lower level of education ( $P = .025$ ). In the bivariate regression, there was no significant relationship found between age and gender and HbA1c.

While examining the pointers in isolated examinations, all controlled for age, sex, training and late confusions, results were like the bivariate relapse results for PAID aggregate and DDS all out (huge) and HADS-A, HADS-D and WHO-5 (not critical). The regimen-related distress and emotional burden on the DDS subscales were both significant (0.038,  $P .001$ , and 0.011,  $P = .036$ , respectively).

Glycemic control was significantly correlated with both the DDS total score (0.038,  $P .001$ ) and the PAID total score (0.021,  $P = .007$ ) in the fully adjusted multiple regression analyses [9]. In the model including the four DDS subscales, just the RD subscale was fundamentally connected with HbA1c (0.056,  $P < .001$ ). The variation in HbA1c was explained 20.3% ( $R^2$ ) by the total DDS model and 15.0% ( $R^2$ ) by the total PAID model. 38.6% ( $R^2$ ) of the variation in HbA1c was explained by the DDS subscale model. By and large prosperity, misery or uneasiness was not essentially connected with HbA1c in any of these models. The maximum VIF was 2.92, and the sensitivity analysis with multiple imputations revealed only slight differences [10].

### Discussion

This study appears to be the first to show that overall well-being, depression, and anxiety among adults with type 1 diabetes were not significantly related to glycemic control, but that diabetes-specific emotional distress and HbA1c were. The regimen-related DDS subscale had the strongest relationship with HbA1c (regression coefficients and  $R^2$ ), and the Diabetes Distress Scale total score was more strongly associated than the PAID total score. There was no critical nonlinearity in the connection between diabetes-explicit close to home trouble and HbA1c.

Fisher and others and Gonzales et al. expressed concern that care strategies based on the depression literature might mistake diabetes-specific emotional distress for depression. Fisher et al. examined the relationships between glycemic control and depression or diabetes-specific emotional distress in people with type 2 diabetes [11]. Glycemic control was found to be significantly related to diabetes-specific emotional distress, but not depression. The similar relationships found in our study with type 1 diabetics lend credence to the idea that in type 1 diabetic clinical consultation, emotional distress and depression should be distinguished as distinct conditions. Fisher and others emphasized that health care providers should recognize the distinction between the severity and content of emotional distress in clinical consultations and proposed that emotional distress is a core construct underlying depression (from depressive symptoms to major depressive disorders) and diabetes-specific emotional distress. Although we are unable to ascertain whether depression and diabetes-specific emotional distress are distinct entities or whether the varying relationships between glycemic control and depression and diabetes-specific emotional distress are due to differences in the severity or nature of emotional issues, both of these possibilities merit consideration [12].

## Conclusion

We demonstrated that glycemic control in adults with type 1 diabetes was significantly associated with diabetes-specific emotional distress, particularly that related to the treatment regimen, but not with depression, anxiety, or overall well-being. Gonzales and co. contend that the acknowledgment of the substance of diabetes-explicit close to home trouble in clinical conferences could require just a little change in the viewpoint of the clinician. According to a recent systematic review of emotional health and diabetes self-care, discussing patients' thoughts and understanding of the disease during clinical consultations may make it easier for health care providers to identify patients in poor emotional health. However Beverly et al. demonstrated that 30% of people with type 1 and type 2 diabetes in their sample were reluctant to discuss self-care in a clinical consultation, and that those who were reluctant reported less frequent self-care, greater diabetes-specific emotional distress, and more symptoms of depression and anxiety; These findings demonstrate the complexity of the clinical consultation relationship between diabetic patients and clinicians. According to our research, it would be possible to gain a deeper understanding of whether or not a patient is experiencing distress as a result of the disease by addressing it during a clinical consultation. Particularly, addressing distress related to the treatment plan and demands on self-care may provide health care providers with the information they need to help the patient manage their diabetes better on their own. If change in glycemic control is designated, zeroing in on diabetes-explicit close to home pain might yield more noteworthy improvement than zeroing in exclusively on achieving in general prosperity.

## Acknowledgement

None

## Conflict of Interest

None

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