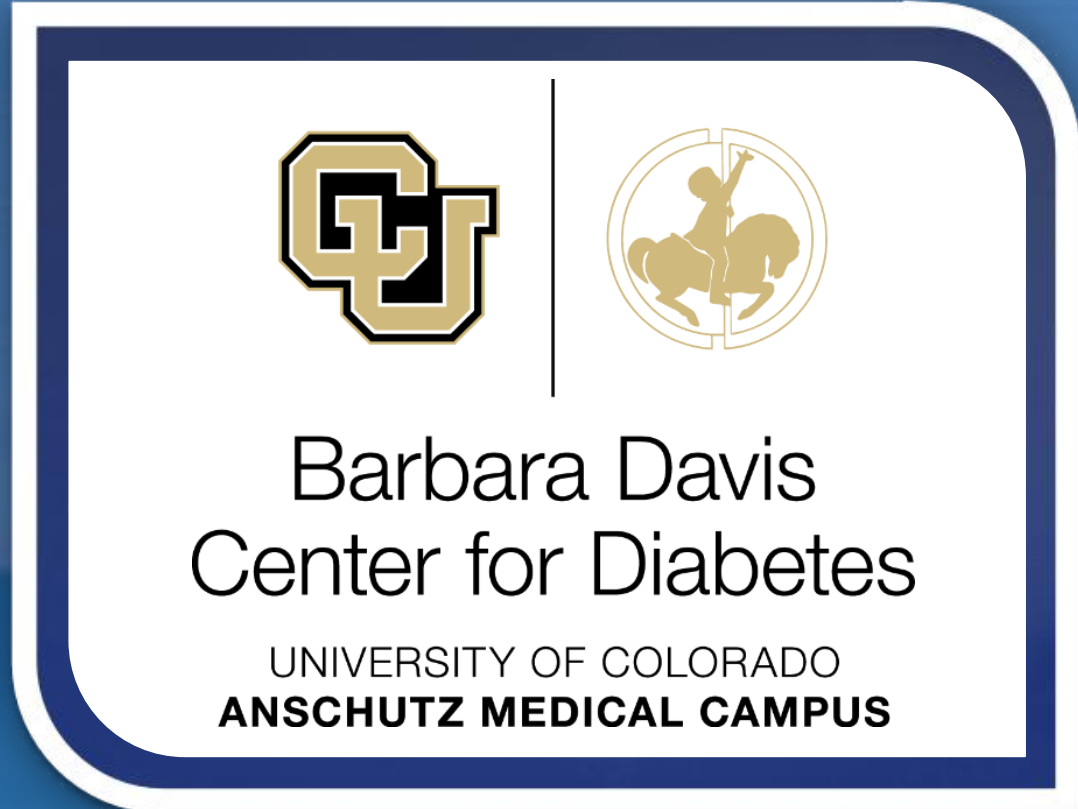


Follow-up Mental Health Care in Youth and Young Adults with Type 1 Diabetes After Positive Depression Screen and/or Suicidal Ideation

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BACKGROUND

- Youth with type 1 diabetes (T1D) are at increased risk for depressive symptoms and suicidal ideation (SI) compared to the general population.¹⁻⁵
 - Youth with T1D who exhibit depression or subclinical depressive symptoms have worse glycemic control and check blood glucoses less frequently.^{1,6-7}
 - Similarly, those with suicidal ideation (SI) were more likely to be non-adherent, have a longer duration of T1D, and have a comorbid psychiatric diagnosis.⁶
 - There are no studies in youth with T1D evaluating follow-up of patients after suicidal ideation is endorsed in clinic to see whether symptoms persisted and if families followed-up with recommended resources.
 - This is a critical area of study to determine how best to manage suicidal ideation
- presenting in the clinical setting to improve follow-up therapeutic management.
- Depression screening has been clinically evaluated in patients 10 years of age and older annually since January 2016 at Barbara Davis Center for Diabetes (BDC). via the Patient Health Questionnaire 9 (PHQ-9), a standardized screen for depressive symptoms, including SI (question 9).
 - This study aims to:
 - Evaluate the psychological resource use in adolescents with T1D after initial endorsement of depressive symptoms and/or SI, and
 - Compare T1D management between those who utilized resources versus those who did not utilize resources and understand predictors of mental health care follow up in those with depression and/or SI.

HYPOTHESES

- Hypothesis 1: Due to the frequency of providing resources to individuals with SI or positive depressive symptoms, we predict that over 50% of patients who endorsed SI or depressive symptoms will have utilized a provided resource.
- Hypothesis 2: Patients who utilized the given resources (i.e. therapy) will have lower follow-up depression scores and will be less likely to continue to endorse SI in subsequent PHQ-9 screens during routine T1D visits.
- Hypothesis 3: Patients who utilized resources will have improved diabetes characteristics (lower hemoglobin A1c (HbA1c), increased insulin pump use, and increased CGM use) compared to those who did not utilize resources.

METHODS

- Participants were identified by clinic database of PHQ-9 scores.
- Clinic PHQ-9 protocol was followed during the initial screening process:
 - If individuals had a PHQ-9 score ≥ 10 , their T1D health care provider discussed the screen and provided resources.
 - If individuals endorsed suicidal ideation, a licensed professional conducted Suicide Risk Assessment, discussed a safety plan, and provided resources.
- Inclusion criteria:
 - Aged ≥ 10 years
 - Diagnosis of T1D and seen at the BDC
 - Completed PHQ-9 as routine clinical care between January 1, 2016 to May 31, 2018
 - A total PHQ-9 score of ≥ 10 Or question 9 (suicidal ideation) score of ≥ 1
- Retrospective data was collected via electronic medical records (EMR) on all participants meeting the inclusion criteria.
- EMR was used to determine resource use.
- Data analysis was performed using R version 4.0.4 software (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

- From January 2016 to May 2018, 1,376 patients 10-25 years old were screened for depressive symptoms using the PHQ-9.
- Of those screened, 200 (14.5%) scored positive for depressive symptomology and/or endorsed suicidal ideation.
- 52% (n=104) of those with positive depressive symptoms/SI utilized given resources through therapy (30%, n=60), psychiatric medications (5%, n=10), or both (17%, n=34)
- Higher initial PHQ-9 score and previous mental health treatment were predictive of obtaining mental health follow-up ($p=0.02$), but SI and other demographics were not (Table 1).
- Demographic information such as race, age, and T1D duration did not vary significantly, but those who used resources were less likely male ($p=0.03$). Male sex was also predictive of not following up.
- HbA1c over time had a decreasing slope for those with follow up, compared to those who did not follow up with mental health care (Figure 1).

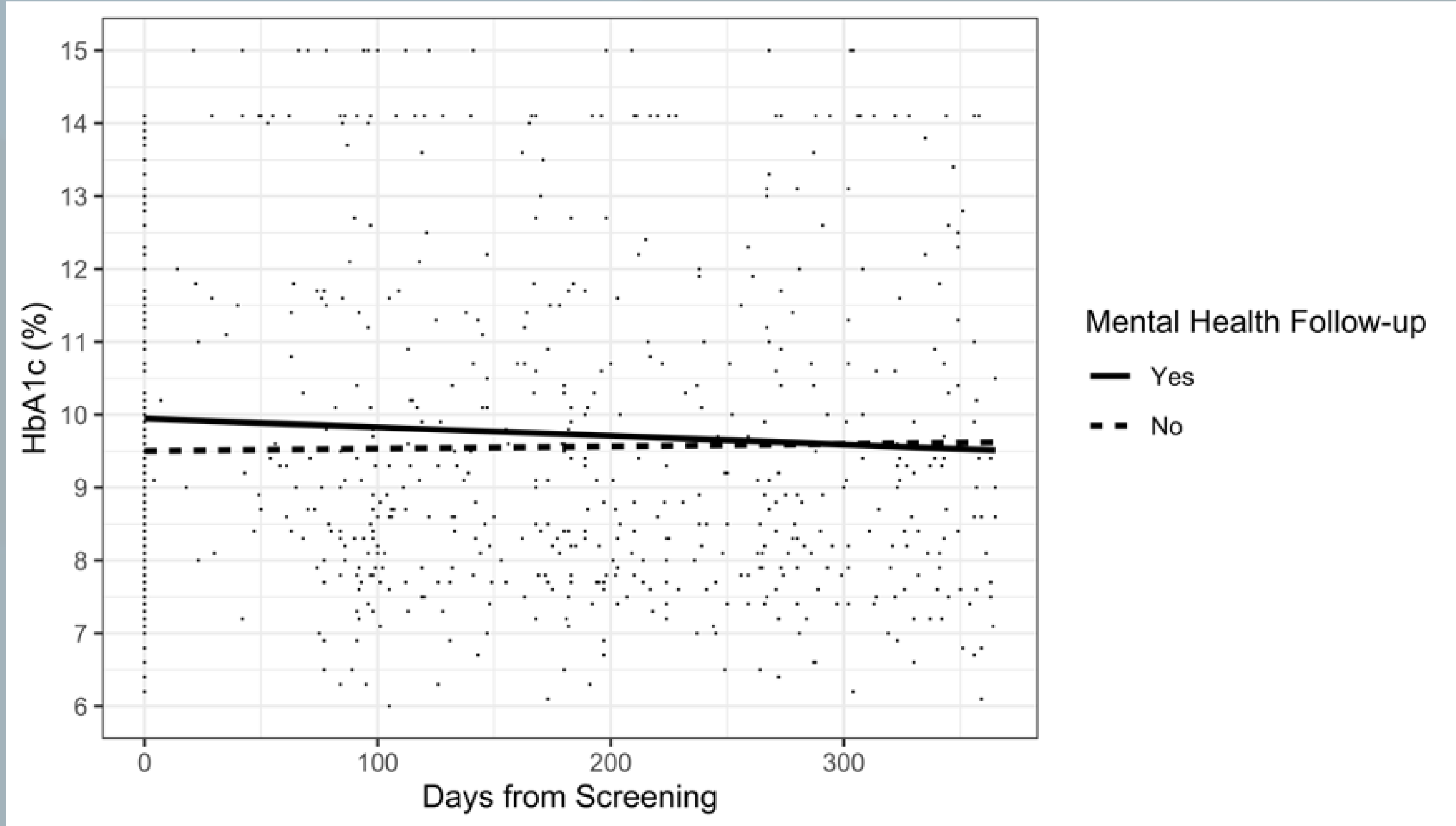


Figure 1: Hemoglobin A1C Values from Depression Screening Date to One Year After Screening. Solid line = group with mental health follow up; Dotted line = group without mental health follow up.. $p=0.03$ (Difference in slope between groups)

Table 1: Predictive Factors in Obtaining Mental Health Follow-Up

	Percent Change
(Intercept)	9.6
Male	-64.8†
Non-White§	38.4
Hispanic	-61.8
Private Insurance	-31.9
A1C at Screening	3.1
PHQ9 Score	8.0*
No Pump	-29.4
No CGM	57.5
No Previous Mental Health Treatment	-66.9†

* $p<0.05$; † $p<0.01$; ‡ $p<0.001$; §Race – Non-White = Black/African American, American Indian/Alaskan Native, Other, and More Than One Race

CONCLUSIONS

- Nearly 15% of our pediatric T1D patients screened at the Barbara Davis Center endorsed depressive symptoms or SI, which is greater than the general population of about 5-9%.⁸
- Regarding hypothesis 1, although more than 50% of those with a positive PHQ-9 or SI utilized resources, it was not considerably more than 50%.
- Though diabetes management was not different between groups, those who followed up with mental health care did have a decreasing HbA1c slope
 - Suggesting mental health treatment may improve diabetes outcomes further out than a year.
- Duration, frequency, and type of mental health treatment should be further stratified in future research.
- Additional studies should investigate how to improve utilization of resources in youth with depressive symptoms or SI, particularly in males and Spanish speaking populations.
 - Investigate how to overcome barriers to seeking mental health care in these groups.