



Diabetes and Suicidality in the Third National Health and Nutrition Examination Survey (NHANES III)

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INTRODUCTION

Background

- Multiple studies have shown that diabetics have a rate of depression approximately twice that of non-diabetics.
- It is also well-established that depressed individuals have an elevated risk for suicide.
- Limited evidence suggests that diabetics may be at an elevated risk for suicidality and that this may be related to blood glucose levels.

Objective

- Given the elevated rate of depression in diabetics and the established association between depression and suicide, we sought to expand on the limited evidence by examining the association between diabetes and suicidality.

METHODS

Data Source

- Data were obtained from the NHANES III public release data files on the NHANES website: <http://www.cdc.gov/nchs/about/major/nhanes/datalink.htm>, and included the "Household Adult" and "Examination" data files.

Participants

- 7,622 individuals between the ages of 17-39.
- All completed measures of the exposure, outcome and covariates.
- Age was limited to 17-39 because the DIS was only administered to this age group.

Exposure, Outcome and Covariates

- Suicidality** was the main **outcome** and was assessed with the DIS depression module.
 - Participants were asked: "Has there ever been a period of 2 weeks or more when you..."
 - "...though a lot about death?"
 - "...felt like you wanted to die?"
 - "...felt so low you thought of committing suicide?"
 - "Have you ever attempted suicide?"
- Diabetes** was the main **exposure** and was assessed by asking: "Have you been told by a doctor that you have diabetes or sugar diabetes?"
- Covariates were obtained from the interview and examination and included: age, race, gender, Depression (DSM-III), BMI (underweight≤18.5; normal=18.5-24.9; overweight=25-29.9; obese≥30), poverty status.

METHODS (CONT'D)

Statistical Analysis

- We calculated chi-square tests of association between diabetes and the four measures of suicidality: thinking about death, thinking about committing suicide, wanting to die and suicide attempt.
- Adjusted models were computed using logistic regression and controlling for: Depression, BMI, age gender, race and poverty status.
- Analyses were not weighted to reflect the NHANES sampling procedure.

RESULTS

Participants:

- 45.9% male, 64.5% White and 72.7% were living at or above the poverty level.
- Mean age was 27.7 (stdev=6.6)
- 2.1% self-reported Diabetes
- 7.9% met the lifetime criteria for DSM-III major depression
- 26.6% had ever thought about death, 16.1% had ever thought about committing suicide, 10.0% had ever wanted to die and 5.5% had ever attempted suicide.

Tables 1a and 1b: Covariates by suicidality variables for participants ages 17-39 in NHANES III (N=7,622).

1a.	Think about death (n=2031)		Think about committing suicide (n=1230)	
	no	yes	no	yes
Diabetes	64.7	35.3*	80.8	19.2
Depression (DSM-III)	31.4	68.6***	39.4	60.6***
BMI:				
Underweight	74.8	25.2**	83.5	16.5
Normal	75.8	24.2	83.7	16.4
Overweight	72.9	27.1	84.2	15.8
Obese	67.8	32.2	84.0	16.0
Age:				
17-22	72.4	27.6	83.4	16.6
23-28	74.8	25.2	83.3	16.7
29-33	74.7	25.3	85.4	14.6
34-39	71.6	28.4	83.7	16.3
Gender:				
M	76.7	23.3**	86.9	13.1**
F	70.5	29.5	81.3	18.7
Race:				
White	74.1	25.9*	82.4	17.6**
Black	71.7	28.3	86.0	14.0
Poverty/Income ratio:				
<poverty	71.0	29.0*	82.9	17.1
≥poverty	74.3	25.7	84.2	15.8

***p<.001 **p<.01 *p<.05

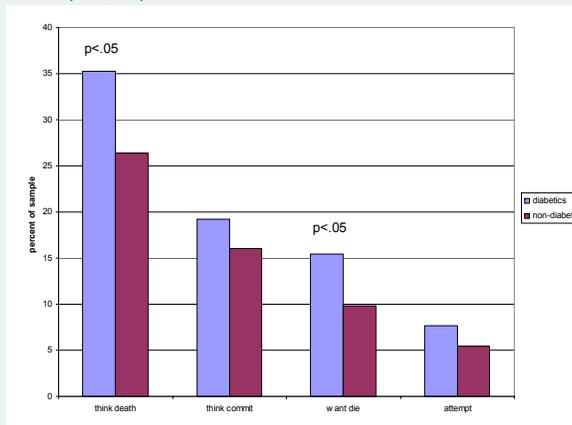
RESULTS (CONT'D)

1b.	Want to die (n=760)		Suicide attempt (n=418)	
	no	yes	no	yes
Diabetes	84.6	15.4*	92.3	7.7
Depression (DSM-III)	50.3	49.7***	76.2	23.8***
BMI:				
Underweight	91.7	8.3*	95.0	5.0
Normal	90.7	9.3	94.9	5.1
Overweight	90.0	10.0	94.6	5.4
Obese	88.1	11.9	93.4	6.6
Age:				
17-22	90.2	9.8	94.1	5.9
23-28	90.7	9.3	94.5	5.5
29-33	89.7	10.3	94.9	5.1
34-39	89.4	10.7	94.7	5.3
Gender:				
M	93.3	6.7**	96.9	3.1**
F	87.3	12.7	92.5	7.5
Race:				
White	89.4	10.6*	94.2	5.8
Black	91.2	8.8	95.1	4.9
Poverty/Income ratio:				
<poverty	86.6	13.4***	92.5	7.5**
≥poverty	91.3	8.7	95.3	4.7

Table 2: Unadjusted associations between diabetes and suicidality in 7,622 NHANES III participants ages 17-39.

	Think about death (n=1963)	Think about committing (n=1186)	Want to die (n=735)	Suicide attempt (n=405)
Diabetes: OR	1.52	1.25	1.67	1.45
(95% CI)	(1.09-2.12)	(0.84-1.87)	(1.07-2.59)	(0.80-2.64)

Figure 1: Comparison of 17-39 year-old diabetic and non-diabetic NHANES III participants on suicidality outcome variables (N=7,622).



RESULTS (CONT'D)

Table 3: Adjusted associations (OR (95% CI)) between diabetes and suicidality in NHANES III participants ages 17-39.

	Think about death (n=1882)	Think of committing (n=1146)	Want to die (n=700)	Attempt (n=388)
Diabetes	1.12 (0.77-1.63)	1.13 (0.72-1.79)	1.23 (0.73-2.07)	1.10 (0.57-2.13)
Depression	6.60 (5.45-8.00)	9.55 (7.92-11.52)	12.26 (10.06-14.94)	6.89 (5.44-8.74)
BMI:				
Normal (ref)	1.00	1.00	1.00	1.00
Underweight	1.03 (0.73-1.44)	0.86 (0.57-1.29)	0.69 (0.40-1.18)	0.75 (0.39-1.43)
Overweight	1.21 (1.06-1.38)	1.00 (0.85-1.18)	1.11 (0.90-1.36)	1.12 (0.86-1.45)
Obese	1.45 (1.26-1.68)	0.92 (0.77-1.10)	1.14 (0.91-1.43)	1.20 (0.91-1.58)

Adjusted for age, gender, race and poverty/income ratio.

DISCUSSION

Conclusions

- In the unadjusted models, diabetics were significantly more likely to think about death and to say they wanted to die compared to individuals without diabetes.
- After adjusting for depression and several other covariates, diabetes was no longer significantly associated with suicidality in this sample.
- In these data, depression likely accounts for the association between suicidality and diabetes.
- In the future, assessing suicidality outside of assessment of depression would contribute to our understanding of this relationship.

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