

THE RELATIONSHIP BETWEEN BMI AND SUICIDALITY IN YOUNG ADULT WOMEN

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BACKGROUND

- Previous studies have found overweight and obesity to be protective against completed suicide in men and women. Findings regarding the relationship between body weight and suicidality and attempt have, however, been mixed, with some studies reporting an increased risk for suicidality among overweight/obese or underweight individuals and others finding no association.

OBJECTIVE

- To explore the relationship between body weight and suicidality in young adult women.
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METHODS

The Missouri Adolescent Female Twin Study (MOAFTS)

- Twins born between 1975 and 1985 ascertained using Missouri State birth records
 - Data for the current study are derived from the Wave 4 assessment conducted between 2000-2005 (median age 22, age range 18-29 years). After excluding women who were known to be pregnant or ≤ 6 months post partum (n=258) and those with missing BMI and/or suicidality information, analyses were conducted on 3517 twins (495 [14.1%] African-American).
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METHODS

Assessments

- Most of the data used in this analysis came from the Wave 4 interview, an adaptation of the Semi-Structured Assessment for the Genetics of Alcoholism. Variables and diagnoses derived from the interview included:
 - Suicidal ideation and attempt; self-reported height and weight; alcohol, tobacco and cannabis use and DSM-IV abuse and dependence; DSM-IV major depression; marital status, self-report of no close friends, childhood sexual abuse (before age 16), menarche before age 12, and weight/shape concern.
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METHODS

Assessments, continued

- Data on parental divorce or separation, as ascertained in the Wave 5 interview, and parental race and education from the parental interview were also used for this analysis
- The suicidality section was separate from the depression section of the Wave 4 interview. Questions used in this analysis were:
 - “Have you ever thought about taking your own life?”
 - If yes: “Did those thoughts about taking your own life ever last for more than a day?”
 - “Have you ever tried to take your own life?”

METHODS

Exposure and outcome variables

- BMI was divided into four groups based on NHLBI guidelines:
 - *Underweight* (n=242) BMI <18.5 kg/m²
 - *Normal weight* (referent; n=2219) BMI 18.5-24.9 kg/m²
 - *Overweight* (n=595) BMI 25.0-29.9 kg/m²
 - *Obese* (n=440) BMI >30 kg/m²
- One 3-level suicidality variable was constructed: attempt, ideation without attempt, and no suicidality (referent).

METHODS

Data Analysis

- Chi-square was used for bivariate analysis, with post hoc tests conducted if the omnibus p-value $\leq .01$
 - Multivariate modeling was conducted using multinomial logistic regression with the 3-level suicidality variable as the outcome and BMI category as the independent variable.
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METHODS

Data Analysis, continued

- Variables were tested as potential mediators if they were significantly ($p \leq .01$) associated with both suicidality and BMI category (see Tables 1 and 2 for a list of variables).
 - A variable was considered a mediator if its addition to the model resulted in a $>10\%$ change in the RRR for any BMI category and a moderator if the addition of the interaction between the variable and any BMI category was statistically significant.
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TABLE 1. BMI category and potential covariates by suicidality

	No suicidality (n=3182)	Ideation (N=135)	Attempt (N=179)	p-value
BMI category	a		b	<.001
<i>Underweight</i>	6.67	12.59	7.26	
<i>Ideal weight</i>	64.74	56.30	46.37	
<i>Overweight</i>	16.97	14.81	19.55	
<i>Obese</i>	11.63	16.30	26.82	
African-American race	13.39 ^a	17.78	24.86 ^b	<.001
Age < 22 years	50.91	44.44	41.44	.020
Married or cohabiting	28.97	27.41	33.15	.459
Parental marital status	a	a	b	<.001
<i>Married to each other</i>	51.87	49.30	28.27	
<i>Not married to each other</i>	41.01	42.96	59.16	
<i>Data missing</i>	2.88	7.75	12.57	
Maternal education	a		b	.003
<i>More than high school</i>	42.63	44.45	34.26	
<i>High school or less</i>	38.06	34.81	33.70	
<i>Data missing ≤ HS</i>	19.31	20.74	32.04	
No close friends	5.11 ^a	8.15	14.44 ^b	<.001

TABLE 1. continued

	No suicidality (n=3182)	Ideation (n=135)	Attempt (n=179)	p-value
Alcohol use < 14 years	6.40 ^a	13.29 ^b	20.41 ^b	<.001
Weekly binge drinking	10.69	12.59	13.26	.456
Alcohol abuse or dependence	10.35 ^a	22.96 ^b	28.18 ^b	<.001
Ever regular smoker	31.32 ^a	43.70 ^b	60.22 ^c	<.001
Regular smoking < 16 years	10.94 ^a	20.15 ^b	25.00 ^b	<.001
Current smoker	28.52 ^a	39.55 ^b	56.35 ^c	<.001
Nicotine dependence	14.61 ^a	31.11 ^b	44.75 ^c	<.001
Weekly cannabis use	11.60 ^a	28.89 ^b	34.25 ^b	<.001
Cannabis abuse or dependence	2.54 ^a	14.07 ^b	13.33 ^b	<.001
Major depression	15.92 ^a	67.41 ^b	72.93 ^b	<.001
Childhood sexual abuse	10.44 ^a	33.33 ^b	55.80 ^c	<.001
Menarche < 12 years	18.86	24.44	24.31	.059
Weight/shape concern	25.84 ^a	51.05 ^b	50.51 ^b	<.001

TABLE 2. Suicidality and potential covariates by BMI category

	Under-weight (n=242)	Normal weight (n=2219)	Over-weight (n=595)	Obese (n=440)	p-value
Suicidality	ac	b		c	<.001
<i>Suicide attempt</i>	5.37	3.74	5.88	10.91	
<i>Suicidal ideation</i>	7.02	3.42	3.36	5.00	
<i>No suicidality</i>	87.6	92.83	90.76	84.09	
African-American race	2.88 ^a	9.36 ^b	23.21 ^c	31.16 ^d	<.001
Age < 22 years	64.20 ^a	53.67 ^b	41.90 ^c	36.34 ^c	<.001
Married or cohabiting	29.34	27.11 ^a	31.39 ^b	35.97 ^b	.002
Parental marital status	a	b	ac	c	<.001
<i>Married to each other</i>	52.44	53.82	46.70	39.67	
<i>Not married to each other</i>	34.96	39.50	45.35	52.27	
<i>Data missing</i>	12.60	6.68	7.96	8.06	
Maternal education		a	b	c	<.001
<i>More than high school</i>	40.73	35.14	42.67	45.25	
<i>High school or less</i>	38.71	45.29	37.24	27.88	
<i>Data missing ≤ HS</i>	20.56	19.30	20.09	26.87	
No close friends	4.13 ^{ab}	4.26 ^a	7.35 ^b	11.59 ^c	<.001
Weight/shape concern	13.36 ^a	25.55 ^b	31.76 ^c	40.85 ^d	<.001

TABLE 2. Continued

	Under-weight (n=242)	Normal weight (n=2219)	Over-weight (n=595)	Obese (n=440)	p-value
Alcohol use < 14 years	7.44	7.31	7.18	7.71	.991
Weekly binge drinking	8.68	12.1 ^a	8.51 ^b	5.44 ^b	<.001
Alcohol abuse or dependence	10.33	12.24	11.35	10.88	.730
Ever regular smoker	37.19	31.59	34.72	37.64	.055
Regular smoking < 16 years	16.12	11.21	11.52	14.58	.076
Current smoker	33.88	28.99	32.55	32.65	.164
Nicotine dependence	17.70	15.46	18.36	20.54	.058
Weekly cannabis use	13.22	13.14	13.04	15.42	.682
Cannabis abuse or dependence	2.07	3.23	3.68	5.69	.054
Major depression	18.11 ^a	18.73 ^a	21.04 ^a	32.05 ^b	<.001
Childhood sexual abuse	13.99 ^{ab}	10.57 ^a	16.53 ^b	24.83 ^c	<.001
Menarche < 12 years	7.92 ^a	15.80 ^b	26.92 ^c	32.27 ^c	<.001

TABLE 3. Multinomial Logistic Regression

	RRR (95% CI)	
	Ideation	Attempt
<u>Unadjusted model</u>		
Underweight	2.09 (1.22-3.58)	1.43 (0.80-2.60)
Ideal weight	1.00	1.00
Overweight	1.01 (0.63-1.61)	1.65 (1.13-2.41)
Obese	1.40 (0.87-2.24)	2.80 (1.93-4.06)
<u>Adjusted model</u>		
Underweight	2.63 (1.52-4.57)	1.73 (0.93-3.22)
Ideal weight	1.00	1.00
Overweight	0.82 (0.48-1.38)	1.19 (0.78-1.80)
Obese	0.80 (0.48-1.35)	1.34 (0.84-2.13)
African-American	1.32 (0.81-2.15)	1.70 (1.14-2.54)
Major depression	8.25 (6.02-12.18)	8.56 (6.02-12.18)
Weight/shape concern	1.97 (1.36-2.84)	1.50 (1.07-2.10)
Childhood sexual abuse	2.40 (1.59-3.65)	5.51 (3.90-7.78)

CONCLUSIONS

- Underweight women were over twice as likely to engage in suicidal ideation than women of ideal weight both before and after adjusting for relevant confounders
- Although overweight and obesity were significantly associated with suicide attempts in the unadjusted model, after adjusting for African-American race, major depression and childhood sexual abuse, the associations were reduced and no longer significant.
- Future research is warranted to explore the mechanisms behind the association between underweight and suicidal ideation in women.