From Body Metrics to Mental Health:

Examining the Links Between BMI, Puberty, Healthcare Access, and Anxiety in Women

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Introduction

There is an established relationship between anxiety and the early pubertal maturation in girls; beyond hormonal changes, puberty brings on noticeable changes in the body that can exacerbate or cause social anxiety (Graber, 2013)

There is limited research around the relationship between healthcare access and anxiety in young people

There is a well-studied relationship between BMI and pubertal timing; longitudinal studies showed that girls with higher body fat began puberty at an earlier age than their peers (Griffith et al., 2007)

Research is limited on if BMI moderates the pubertal timing/anxiety relationship

Research Questions

If BMI correlates with age of first period, does anxiety moderate that relationship?

Is healthcare access related to anxiety?

Does healthcare access affect the relationship between age of first period and BMI?

Methods

Sample:
3,312 young women from the first wave of the National Longitudinal Study of Adolescent to Adult Health (ADD HEALTH Wave One).

The ADD HEALTH Wave One is a nationally representative sample of adolescents in the US school system from grades 7-12.

Measures:
Anxiety was assessed by adding scores from questions concerning how often the respondent experienced 'fearfulness' and 'trouble relaxing' over the past twelve months.

BMI was calculated using height and weight responses of participants

Consistent access to healthcare was measured in 'yes' or 'no' in response to "Has there been any time over the past year when you thought you should get medical care, but you did not?"

Age of pubertal maturation in women was approximated using responses to the question, "How old were you when you had your very first menstrual period"

Results

Univariate:
The average age of the girl's first period was 12 years old

The mean anxiety score was 1.36, meaning the average respondent experienced fearfulness and/or trouble relaxing less than once a week.

The average BMI of participants was 22.3 (falls right in the middle of the 'healthy' range for women'

20.3% of respondents marked that in the last year were not always able to see a medical professional when they felt they needed to

Bivariate:
The age of a respondent's first period was **not significantly associated** with anxiety (R^2=0.000, p = 0.945). BMI was not significantly associated with anxiety (R^2=0.000, p = 0.554)

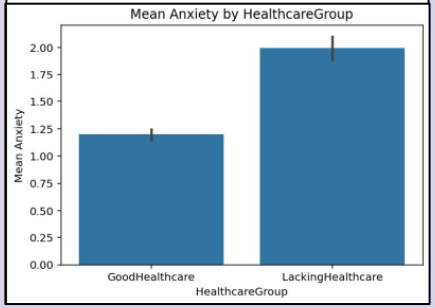
BMI was significantly related to age of first period. A one-unit increase in bmi is associated with a decrease of 0.0408 years in period age. (R^2= 0.018, p<0.001)

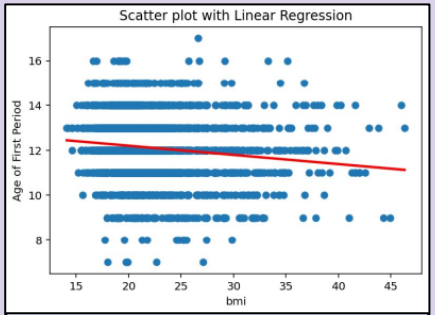
There is a **minimal but significant relationship** between BMI and consistent access to healthcare. (β=0.0053, p= 0.001)

Inconsistent access to healthcare was **significantly associated** with anxiety: a one unit increase in anxiety makes it ~7% more likely to have inconsistent healthcare access (p<0.001)

Multivariate:
There is **no statistically significant evidence** that healthcare access moderates the relationship between BMI and age of first period. The association between BMI and period age was weakened for individuals with inconsistent healthcare access, however, that was not significant (p=0.291)

There is **no evidence to suggest that anxiety moderates the relationship** between BMI and age of first period, the change in the BMI/Period age relationship was not significantly affected by anxiety (p=.259)





Discussion

In the ADD HEALTH Wave One, previous findings that a girl's age when she gets her first period correlated with anxiety were not replicated; no significant relationship was found. However, because the mean age of pubertal maturation in girls within the ADD HEALTH Wave One is so high, there may have simply not been enough data on girls with a low age of pubertal maturation to find a significant result.

In adolescent girls, anxiety is not related to BMI. Importantly, this goes against the stereotyping of girls with a higher body mass index having 'worse' mental health; no significant relationship was found.

Further, the relationship between BMI and age of first period was not moderated by anxiety; this means that, in this study, high anxiety was not the underlying factor causing a link between high BMI and low age of first period.

References

Julia A. Graber, Pubertal timing and the development of psychopathology in adolescence and beyond, Hormones and Behavior, Volume 64, Issue 2,2013, Pages 262-269,
Griffiths, P. L., & Lee, S. (2007). Weight status in young girls and the onset of menarche. *Pediatrics, 119*(3), e624-e631. https://doi.org/10.1542/peds.2006-1428