



Changes in BMI and risk of adolescent psychopathology; a longitudinal cohort study

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Background:

Abnormal BMI, both overweight (1,2) and underweight (3), has been shown to be associated with psychopathology in adolescents. A 2011 study on Australian children showed that increasing BMI in childhood was associated with poorer Health Related Quality of Life (4). Increasing or decreasing weight has been shown to be associated with increased risk of feeling insecure in children (5).

AIM 1: To investigate the association between childhood and adolescent BMI and adolescent psychopathology.

AIM 2: To investigate the association between change in BMI between childhood and adolescence and adolescent psychopathology.

Method

Participants

Our participants consisted of members of the Growing Up in Ireland (GUI) study. The GUI is a national longitudinal study of children and adolescents from the general population in Ireland. The GUI consists of two cohorts; an infant ('08) cohort and a child ('98) cohort. We present data on the '98 cohort. This cohort comprised of 8658 children and their families who were recruited from national primary schools at age 9. Four years later, all 8658 were targeted for re-recruitment and 7423 were interviewed at age 13.



Exposures

Definitions for Overweight (6) and Underweight (7) were adopted from Gender specific Internationally recommended cut off based off of growth curves. BMI's of the children at age 9 and 13 were calculated by dividing their measured weight (kgs) by their squared height (m²).



9 year olds	Underweight	Overweight
Male	<14.35	>19.1
Female	<14.28	>19.07
13 year olds	Underweight	Overweight
Male	<15.84	>21.91
Female	<16.26	>22.58

Outcomes

The Strengths and Difficulties Questionnaire, filled out by the primary caregiver when the child is 13, was used. A cutoff ≥ 17 indicates psychopathology (8).

Statistical Analysis

IBM SPSS Statistics Version 25 package was used. The analyses were weighted.

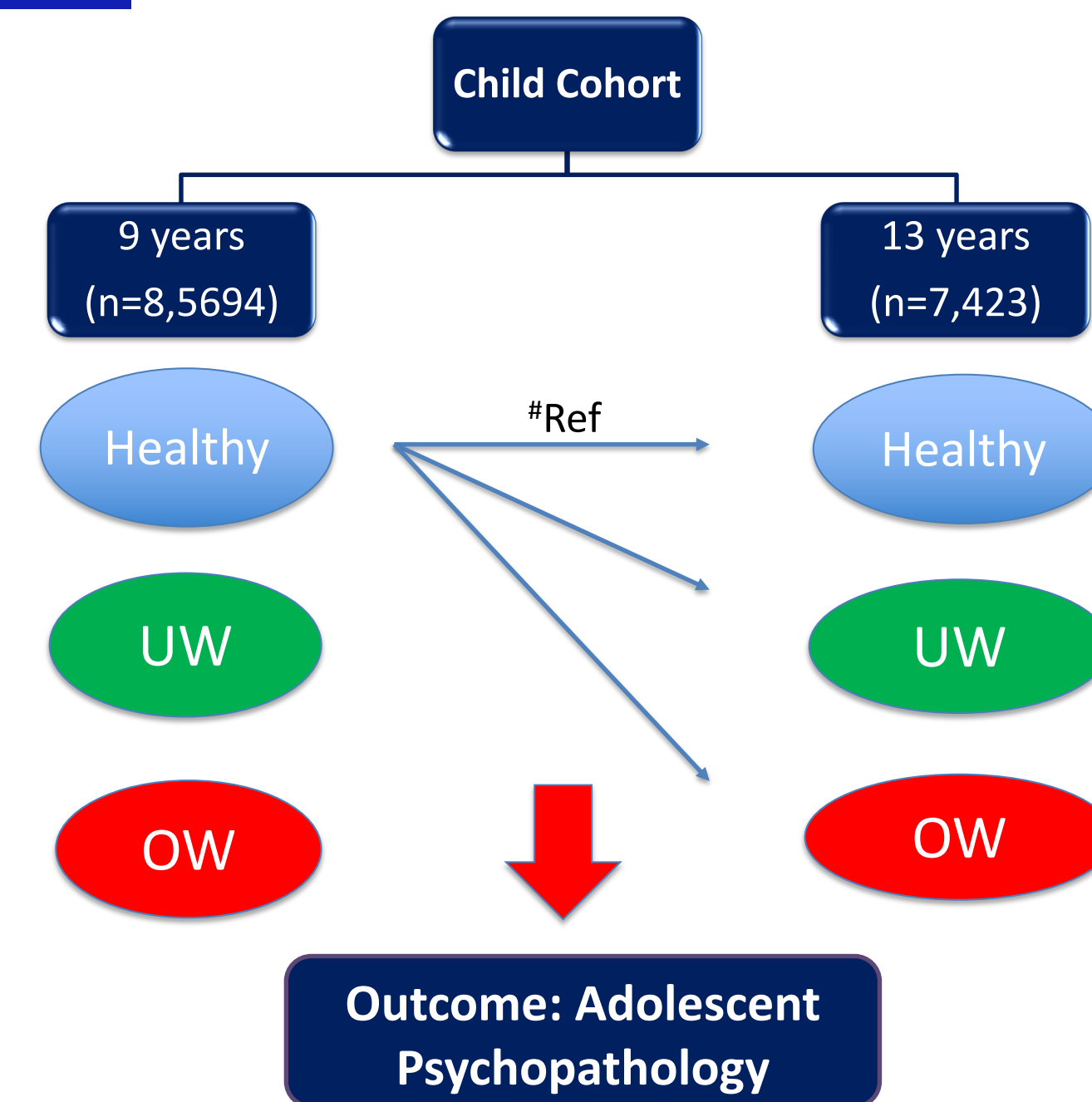
Logistic Regression was used, to examine Aim 1 and 2. Univariate and multivariate analyses were conducted in order to investigate, respectively, the association without and with adjustments.

Procedure: Visual Schematic for the analysis used for the association between change in BMI risk of Psychopathology

UW = underweight OW = overweight

Childhood Confounders*

Socio-Economic Status
Maternal Education
Physical activity
Chronic Illness
Gender
Screen Time
Nationality
Childhood Psychopathology



*based on age 9 data; #:Reference Category

Results: Aim 1 - The Association Between Problematic BMI and Psychopathology.

Childhood Problematic BMI and Adolescent Psychopathology Childhood BMI was not significantly* associated with adolescent psychopathology

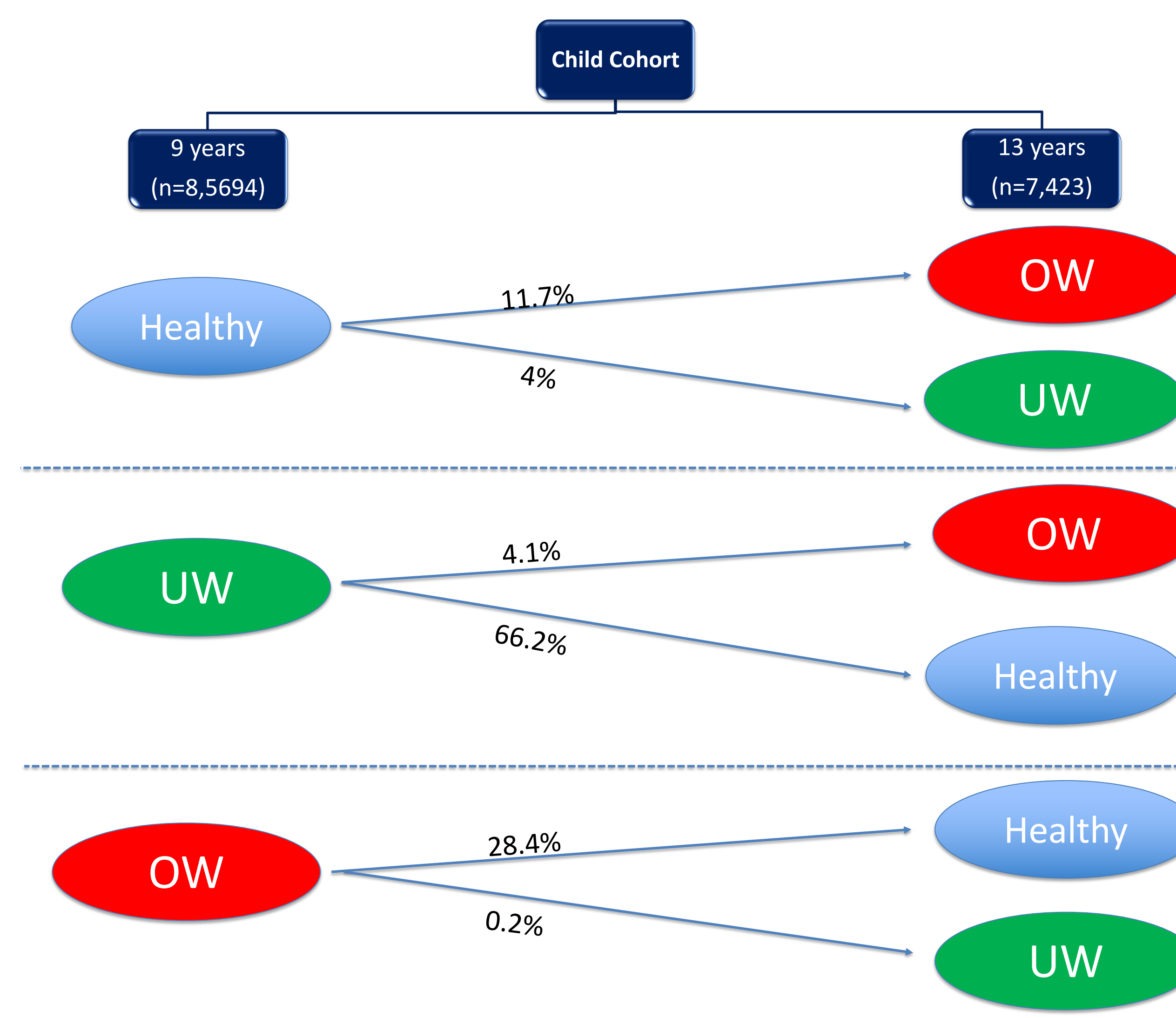
BMI	Unadjusted Odds Ratio	Adjusted OR	Adjusted OR (+ child SDQ adj.)
UW	1.1 (0.7-1.6)	0.9 (0.6-1.5)	1.2 (0.8-1.9)
OW	1.1 (0.9-1.3)	0.9 (0.7-1.1)	0.8 (0.6-1)

Adolescent Problematic BMI and Psychopathology OW at age 13 is significantly* associated with psychopathology

BMI	Unadjusted Odds Ratio	Adjusted OR	Adjusted OR (+ child SDQ adj.)
UW	1.5 (1-2.3)	1.2 (0.8-2)	1.4 (0.9-2.3)
OW	1.7 (1.4-2.0)	1.4 (1.1-1.7)	1.4 (1.1-1.7)

*p value = <.05

Results: Aim 2 - Change in BMI and Psychopathology



Outcome: Adolescent Psychopathology

Adjusted OR	Reciprocal of Adjusted OR
2.1 (1.6-2.8)	-
1.1 (0.6-2.1)	-
0.9 (0.2-4.9)	-
0.2 (0.1-0.6)	5.0 (1.7-10)
0.5 (0.3-0.8)	2.0 (1.25-3.3)
n/c	n/c

Conclusion

Overall, our study has shown that change in BMI from healthy to overweight increases a child's risk of developing psychopathology. Additionally, we have shown that a change in BMI from overweight or underweight back within normal range decreases a child's risk of developing psychopathology. Therefore our results support the hypothesis that intervening in encouraging weight loss in overweight children improves psychological well being.

This is an optimistic finding which, coupled with further investigation, should educate on intervention forms for preventing psychological illness.

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Funding: This study was funded by the European Research Council IHEAR project to Prof. M Cannon and the TCD School of Medicine Research Elective Grant. Ethical Approval was granted in April 2-19 by RCSI ethics. Previously presented at RAMI student research awards 2019.