

Trajectories of Overweight/Obesity in Taiwan Youth

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INTRODUCTION

- Youth overweight/obesity is a pivotal international problem and leads to chronic diseases in adulthood
- The prevalence of overweight and obesity among adolescents has increased in many countries
- The short and long-term health prognosis of overweight or obesity in childhood or adolescence was considered to be associated with risk of chronic disease in later life

OBJECTIVES OF THE PRESENT STUDY

- To explore the heterogeneity in trajectories of overweight/obesity among adolescents
- To identify the factors that may be associated with the trajectory group membership

METHODS

Study Design and Participant

Children and Adolescent Behavioral in Long-term Evolution, CABLE

- A prospective cohort study on school children in urban (Taipei City) and rural (Hsin-Chu County) area in Taiwan.
- A probability sample of first graders and fourth graders from 18 randomly selected public elementary schools
- Baseline survey conducted in 2001 and follow-up annually, using face-to-face interview and self-administered questionnaires.
- Sample Size
 - First grader in 2001: n=2,855 (girl: 49.0%)
 - Fourth grader in 2001: n=2,688 (girl: 48.5%)

Variables

Self-reported data used for present study

- Overweight/obesity of the participants: Body Mass Index (BMI) computed from self-reported body weight and height data at baseline survey and annual follow-ups; then categorized into overweight/obesity and non-overweight/obesity according to the standard of Adolescent Obesity Definition announced by the Department of Health.
- Parental obesity: BMI computed from parent's body weight and height; then defined higher than 27 as "Obesity".
- Paternal education: Categorized in to "Primary and Secondary" and "College and above".
- Puberty: Yes/No defined by "menarche" for girls and "ever wet dream" for boys at 7th grade.

Statistical Analysis

- Group-based trajectory modeling

Figure 1. Group-based trajectory model of overweight/obesity in girls

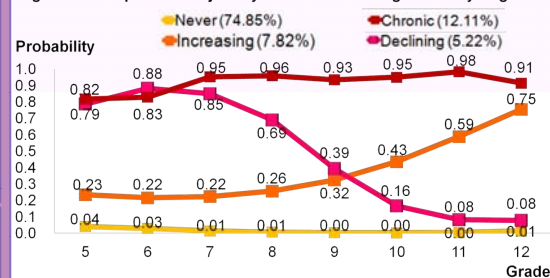


Table 1. The Correlation between Girls' Overweight/Obesity Trajectories and Related Risk Factors

Related Risk Factors	Never Overweight/Obesity		Increasing Probability Of Overweight/Obesity		Declining Probability Of Overweight/Obesity		Chronic Overweight/Obesity	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Cohort	Ref.							
Ref: Cohort 1			-0.09	0.34	0.33	0.47	0.24	0.27
Residential Area								
Ref: Urban area (Taipei City)			-0.24	0.23	-0.07	0.28	-0.07	0.17
Puberty Status at 7th Grade								
Ref: Never menarche			0.64	0.29*	1.53	0.71*	1.30	0.28*
Paternal Education								
Ref: Higher than College/University			0.53	0.24*	0.19	0.29	0.64	0.17*
Parental Obesity								
Ref: Without Parental Obesity			1.37	0.43*	-0.24	2.36	1.49	0.34*

* Refers to significant difference (p<0.05)

Figure 2. Group-based trajectory model of overweight/obesity in boys

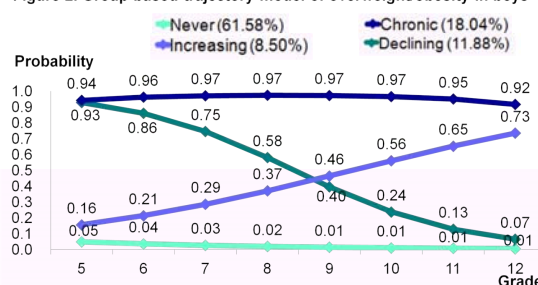


Table 2. The Correlation between Boys' Overweight/Obesity Trajectories and Related Risk Factors

Related Risk Factors	Never Overweight/Obesity		Increasing Probability Of Overweight/Obesity		Declining Probability Of Overweight/Obesity		Chronic Overweight/Obesity	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Cohort	Ref.							
Ref: Cohort 1			0.84	0.46	-0.40	0.19*	0.13	0.15
Residential Area								
Ref: Urban area (Taipei City)			-0.21	0.25	-0.48	0.19*	-0.23	0.14
Puberty Status at 7th Grade								
Ref: Never wet dream			-0.17	0.32	0.10	0.22	-0.02	0.17
Paternal Education								
Ref: Higher than College/University			0.26	0.25	0.28	0.19	0.17	0.14
Parental Obesity								
Ref: Without Parental Obesity			1.28	0.59*	-0.09	0.39	1.19	0.21*

* Refers to significant difference (p<0.05)

RESULTS

- Four distinct trajectories were identified in girls, including "never overweight/obesity" (74.85%), "declining probability of overweight/obesity" (5.22%), "increasing probability of overweight/obesity" (7.82%), and "chronic overweight/obesity" (12.11%) (Figure 1).
- Compared to those grouped as "never overweight/obesity", girls in the "chronic overweight/obesity" and increasing probability of "overweight/obesity" groups tended to have lower paternal education or obesity parents. Otherwise, girls in "never overweight/obesity" group exhibited higher probability to have late puberty status (Table 1).
- The trajectory groups for boys were "never overweight/obesity" (61.58%), "declining probability of overweight/obesity" (11.88%), "increasing probability of overweight/obesity" (8.50%), and "chronic overweight/obesity" (18.04%) (Figure 2).
- Boys with obesity parents tended to have an increasing risk of belonging to the "chronic overweight/obesity" or "increasing probability of overweight/obesity" groups. As to the boys in "declining probability of overweight/obesity" group, there were significant differences between urban boys and their rural counterparts. (Table 2)

CONCLUSIONS

- More than 1/10 of the girls and around 1/5 of the boys were chronically overweight/obesity through their adolescence.
- Almost 10% (7.8% for girls and 8.5% for boys) of children had an increasing risk of being overweight/obesity.
- Parental obesity and education were apparently related to their children's overweight/obesity.
- Puberty status was an important mediation to overweight/obesity in girls.