

Longitudinal Study of Psychological Distress and Changes in Body Mass Index in Adolescents with Overweight/Obesity

Grace Cheng En Hui¹, Khairunisa Binte Khaider², Rehena Sultana³, Chew Chu Shan Elaine²

¹Duke-NUS Medical School, Singapore, ²Adolescent Medicine Service, Department of Paediatrics, KK Women's and Children's Hospital, Singapore, ³Centre for Quantitative Medicine, Duke-NUS Medical School, Singapore

Background

- **Childhood obesity** is rising in Singapore – the prevalence has increased from **11%** in 2013 to **16%** in 2021¹.
- Childhood obesity is associated with many physical and psychosocial health consequences².
- The association between **psychological distress** and **response to obesity treatment amongst adolescents** in Singapore has yet to be examined.
- The findings can potentially inform early screening psychological interventions.
- A commonly used measure for assessment of psychological distress in adolescents is the **Young Person's Clinical Outcomes in Routine Evaluation (YP-CORE)**³.

Objectives

This preliminary study aimed to investigate:

1. **Changes in body mass index (BMI)** over 6 months amongst adolescents with overweight/obesity seeking obesity treatment **presenting with or without psychological distress**
2. **Gender** as a moderating variable

Methods

Recruitment

- **Recruitment period:** June 2022 to January 2023
- **Inclusion criteria:** Adolescents aged 11 to 17 on follow-up with KK Hospital (KKH) Weight Management Clinic, with BMI values measured at KKH 6 months after recruitment into the study
- **Exclusion criteria:** Adolescents who cannot independently complete the YP-CORE in English, or were previously diagnosed with psychological disorders and sought psychological help
- **Ethics approval:** SingHealth Centralised Institutional Review Board

Baseline demographic and anthropometric data

- Collected at recruitment and 6 months
- **BMI** was analysed as a **percentage of the 95th percentile BMI (%95th BMI)**, calculated using age- and gender-specific Centers for Disease Control and Prevention (CDC) growth charts⁴

YP-CORE Questionnaire

- Participants completed the YP-CORE at recruitment (baseline)
- YP-CORE is a 10-item measure, with each question rated based on a five-point Likert scale from 0 to 4
- Total score = Sum of all the individual scores (/40)
- Clinically significant **cut-off values** (age- and gender-specific) were referenced⁵
- Significant psychological distress was indicated by scores above the cut-off

Age	YP-CORE cut-off values	
	Male	Female
11-13	10.3	14.4
14-18	14.1	15.9

Statistical Analysis

- Data was analysed using SPSS version 29.0
- Independent *t*-test was used to compare changes in %95th BMI for adolescents presenting with and without psychological distress

Results

	N=	No psychological distress			Psychological distress			p value		
		n=	Mean (SD)	Median	IQR ¹	n=	Mean (SD)		Median	IQR ¹
Males + Females	48	29	-3.9 (6.0)	-4.1	8.5	19	-2.4 (8.8)	-1.7	9.6	0.506
Males	35	24	-3.8 (6.5)	-4.3	9.1	11	-6.9 (8.6)	-6.1	8.4	0.253
Females	13	5	-4.0 (2.6)	-4.0	4.2	8	3.7 (4.5)	3.3	9.2	0.006

¹ IQR refers to interquartile range.

Table 1. Changes in BMI (%95th BMI) over 6 months (mean, median, IQR, p value).

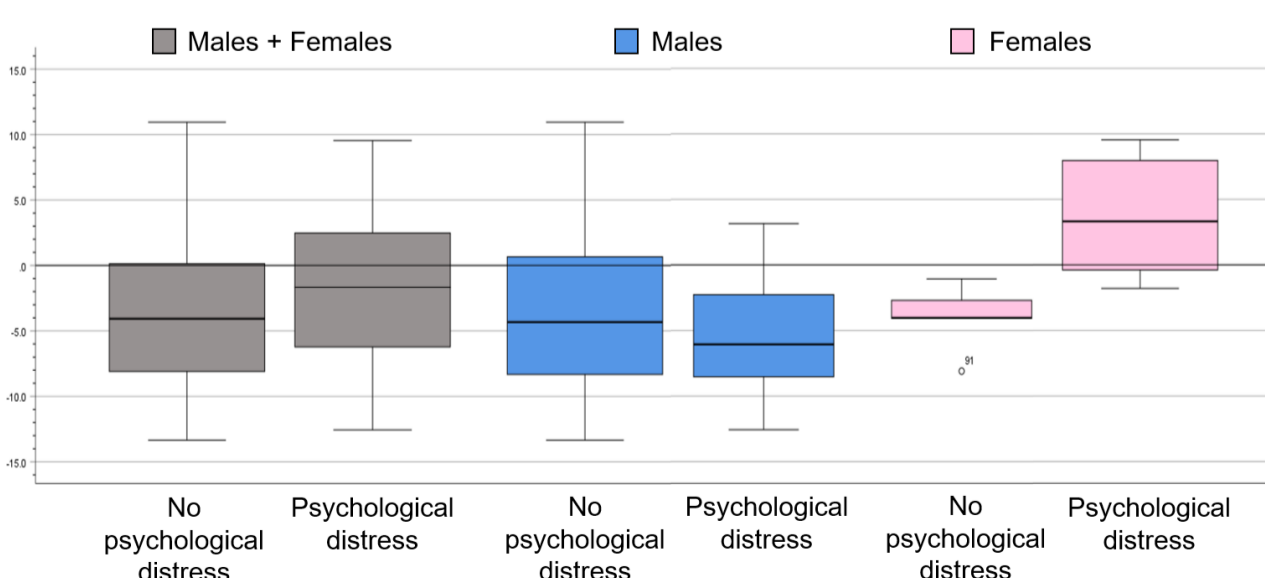


Figure 1. Boxplot of changes in BMI (%95th BMI) over 6 months for males and females, presenting with and without psychological distress.

- When analysing both genders together, there was no significant difference in changes in BMI between those presenting without or with psychological distress
- When analysing by gender, there was a **significant difference in changes in %95th BMI** between those presenting without or with psychological distress for **females** but not for males (Table 1, Figure 1)

Conclusion

- **Psychological distress** is associated with **less improvement in BMI for females**.
- These results highlight the potential role of systematic screening for psychological distress in adolescents with overweight/obesity for early psychological interventions as part of obesity intervention.

References

- ¹Annual Prevalence of Obesity for Children Aged Below 18 Over Past Five Years, Their Profile and Assessed Effectiveness of Preventive Measures [Internet]. Ministry of Health; 2022 [cited 2023 Oct 23].
- ²Anderson Y, Chew CSE. Consequences of Childhood and Adolescent Obesity. In: Clinical Obesity in Adults and Children. John Wiley & Sons, Ltd; 2022:339-352. doi:10.1002/9781119695257.ch26
- ³Twigg E, Barkham M, Bewick BM, Mulhern B, Connell J, Cooper M. The Young Person's CORE: Development of a brief outcome measure for young people. Counselling and Psychotherapy Research. 2009;9(3):160-168. doi:10.1080/14733140902979722
- ⁴Centers for Disease Control and Prevention. Growth Charts - Percentile Data Files with LMS Values. Published December 12, 2022. Accessed August 23, 2023. https://www.cdc.gov/growthcharts/percentile_data_files.htm
- ⁵Twigg E, Cooper M, Evans C, Freire E, Mellor-Clark J, McInnes B, & Barkham M. (2016). Acceptability, reliability, referential distributions and sensitivity to change in the Young Person's Clinical Outcomes in Routine Evaluation (YP-CORE) outcome measure: Replication and refinement. Child and Adolescent Mental Health, 21(2), 115-123. <https://doi.org/10.1111/camh.12128>

Contact

Grace Cheng
gracecheng@u.duke.nus.edu