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# Predictors of adolescents' weight misclassification: A longitudinal study

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## KEYWORDS

Adolescent;  
Body weight;  
Mother;  
Predictor;  
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## Summary

**Objective:** To examine adolescents' and mothers' misclassification of the adolescents' body weight and associated early life predictors.

**Methods:** Data are from a sample of women and their children who were part of a longitudinal Australian birth cohort study. We analysed data of 3925 adolescents, 3721 mothers, and 2593 mother–offspring pairs. At the 14-year follow up, we derived adolescents' body weight category (underweight, normal or overweight) based on their measured height and weight and adolescents reported their similar subjective weight categories. Similarly, mothers reported perceived weight of their adolescents' offspring. We compared objectively measured weight with subjective weight perceptions to identify misclassifications. Possible predictors of weight misclassification were taken from pregnancy, childhood and the adolescent period.

**Results:** Almost a third of adolescents and a quarter of mothers misclassified the adolescents' body weight. Underestimation was observed more often in overweight adolescents. Overestimation was observed more often in underweight adolescents. More than a third of underweight adolescents and almost half of mothers of underweight children overestimated the adolescent's body weight. Normal weight females overestimated their body weight more than their males' counterparts. Predictor of misclassification included being female; dieting to lose weight; having over or underweight mothers; and having high level of poor mental health.

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*Conclusions:* Findings of this study suggest that adolescent weight misclassification is common across all BMI categories. Being female, dieting to lose weight, poor mental health and maternal BMI status predict misclassification. Further studies are needed to evaluate the population health significance of weight misclassifications.

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## Introduction

Adolescent's overweight and obesity are major public health problems. Prevalence rates of overweight and obesity have been increasing globally over the past few decades [1]. Despite recent intervention efforts, adolescents frequently experience overweight and obesity [1,2]. Among the psychological factors associated with adolescent obesity, inaccurate self-perception of body weight may contribute to obesity in adulthood [3–5]. Although there is increased attention and public awareness of obesity management [6,7], there is little known about misclassification of body weight as a phenomenon among adolescents [3,8,9]. Importantly, there may be role for parental recognition and involvement in their adolescents' management of body weight [10–12].

There is some evidence that adolescents' and parents' misperception of their offspring's body weight may be important as a basis for responding to obesity in early life [5,9,12–14]. A large 11-year longitudinal study found that normal weight adolescents, who perceive their body as overweight, gained more weight during early adulthood compared to those who perceived themselves as normal weight [4]. Another longitudinal study of adolescents found that accurate weight perceivers were more likely to try to eat less and maintain their body weight, and engage in physical activities compared to inaccurate perceivers [9].

Studies consistently report that many adolescents may misclassify their own weight regardless of their actual body weight; they more often underestimate rather than overestimate their body weight [3,8,15,16]. Additionally, body weight misclassification is not confined to the adolescents themselves. Some studies report that a large proportion of parents fail to accurately perceive the weight status of their adolescents [14,17]. Perception of one's body weight may be a subjective experience. It is plausible that parents' perception of their adolescents' body weight will not be the same as their adolescent's perception. Having more than one informant may be helpful in determining whose perception is more accurate, self-perception or parental perception. Very little is known about parents and their adolescent's misclassification of the adolescent's observed body weight under the same criteria of measurement.

While body weight misclassification is a phenomenon among adolescents regardless of their actual weight status, there is mounting evidence that an increase in body mass index (BMI) is one of the main predictors of body weight misclassification among adolescents. Studies have

found up to 80% of adolescents who are overweight or obese misclassify their body weight [3,8,15,18]. On the other hand, a recent study among Japanese adolescents (12–13 years old), where prevalence of obesity is relatively low, reported that a normal weight group experienced more body weight misclassification compared to other groups. In this latter study, more than 78% of the original sample were normal weight [19].

Moreover, adolescents who have parents who are overweight or obese tend to misclassify their own body weight more often compared to those children whose parents are of normal weight [20]. There is also some evidence to suggest gender differences in possible predictors of weight misclassification. Females usually aspire to have a slim body shape while males prefer to have a muscular body shape [21]. Females commonly misclassify their body weight more than males; moreover, females are more likely to overestimate their body weight while males are more likely to underestimate it [3,15,19]. Parents may be subject to similar patterns of misclassification when it comes to the estimation of their adolescents' body weight; parents are likely underestimate their sons' weight more than their daughters and overestimate their daughter's weight more than their sons [17]. Some researchers have also found that parents may underestimate the body weight of both genders [22]. By contrast, other studies have found that parents may be more accurate at recognising the adolescents' body weight than the adolescents themselves [22,23].

In addition to the previous potential predictors of body weight misclassification, some sociocultural, economic, and psychological factors need to be considered. For example, watching television [12] and unhealthy dieting [3,5] may promote ideal body internalisation and dissatisfaction of body weight among adolescents [24,25]. The contribution of other factors such as ethnicity [18,26], growth-related factors including birth weight and puberty development [27,28], psychological distress and depression [5,29], socioeconomic status including parents' education, and family income [26], and physical activity [9], to weight misclassification have not been adequately considered. In a previous study, we found that gender, maternal BMI, and child's dieting are significant predictors of maternal misclassification of the adolescents' body weight [17]. The current paper extends our previous work by examining adolescent's early life predictors and misclassification of their body weight and by addressing the level of agreement–disagreement when comparing mother and offspring subjective perceptions with offspring objective weight.

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