Body image and obesity among Australian adolescents from indigenous and Anglo-European backgrounds: implications for health promotion and obesity prevention among Aboriginal youth

Renata Leah Cinelli and Jennifer A. O’Dea

Abstract

This study examines the relationship between body image and obesity, among 4367 indigenous and Anglo-European adolescents in Australia in 2006. It shows that indigenous adolescents, male and female, were more likely than their non-indigenous counterparts to desire and pursue weight gain. Indigenous males showed the greatest tendencies to gain weight and to perceive that they should build up their bodies. They also received the strongest parental advice to eat more, lose weight, do more exercise, do less exercise, and heed warnings that they were not eating enough. The percentage distribution of weight, from obese through to underweight, was not significantly different between indigenous and Anglo-European adolescents. Poor body image among obese adolescents was similar in all groups. This article concludes that indigenous Australian adolescents are more likely to desire weight gain and receive more parental and family advice about the desirability of gaining weight. Indigenous adolescents from around the world may have to grapple with conflicting cultural perceptions involving their own self-image, parental coercion and peer group pressure. Therefore, before planning and designing health education programs for indigenous young people, educators and health professionals should consider cultural attitudes lest they inadvertently create weight concerns, confuse or contradict healthy lifestyle messages.

The research literature on the influence of ethnicity or culture upon the body image of children and adolescents is not concrete in regard to whether such impact is negative or positive, or whether children and adolescents may be protected from any adverse body image concerns by their ethnic groups. The current study seeks to obtain a greater culturally based knowledge and awareness of these issues, in order to learn more about how schools, communities and other educational organisations can best promote a positive, healthy, functional body image for children from various ethnic and cultural backgrounds.

In a study from the United States, Abrams and Stromer [1] investigated the influences of ethnicity, socioeconomic status (SES) and ethnic peer group on awareness and internalization of socially sanctioned standards of appearance. The results showed that white girls invariably internalized and were more aware of the thin ideal than other groups and that African American girls were the least likely to detect or internalize these sociocultural messages. Similarly, another American study comparing ethnic and cultural perceptions of body image found that there was a greater social approval of a large body size for black adolescent females, but that white adolescent females desired smaller body size [2]. African American girls who had ethnically heterogeneous peer groups were more aware of and more likely to internalize these thin ideals than those who only mixed with their own ethnic group. It is well established that for adolescents, peers have a great deal of influence on the development of weight ideals and perceptions [3–5]. In

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addition, several researchers report that peers, along with mothers and the media, are perceived to encourage females to lose weight [6, 7].

Indigenous peoples from various developed countries worldwide are generally more likely than their non-indigenous peers to be overweight or obese (providing that the food and calorie supply is stable and accessible) [8, 9] and, as a consequence, indigenous peoples may also be more likely to incur weight-related health problems like type 2 diabetes [10, 11]. However, there is scant knowledge about the difference between indigenous and non-indigenous young people, when it comes to weight-related beliefs, attitudes, desires and behaviours.

Ethnic differences in the way indigenous and non-indigenous youths perceived body weight were recently identified in a study from the state of MT, USA [12], which examined, among other variables, the relationships between ethnic differences in weight concerns among Native American and white adolescents. The report indicated that the Native American girls in their study had a greater desire for larger body size than their white peers.

In general, research findings about high body dissatisfaction are concerning because a poor body image is associated with a poor perception of self. This incorporates poor physical, social and academic self-concepts [13], as well as low overall self-esteem [14]. In addition, young people with poor body image are known to be susceptible to dieting, disordered eating and eating disorders [15]; those who seek weight gain and muscle mass are prone to excessive exercise and injuries [16] and steroid abuse [17]—all of which have deleterious side effects in growing children.

Conversely, the promotion of a healthy body image is desirable in young people because it impacts on many aspects of adolescent health including self-image, psychological health [13] and participation in physical activity [18, 19]. It also contributes to self-concept factors that promote and protect general child health status [20].

The aims of this study were to compare the body image, weight status, desired weight and weight control behaviours of male and female Australian adolescents from indigenous and Anglo-European backgrounds. The unique focus of the current study was to investigate the extent of body image concerns among indigenous young people and identify any differences or similarities in the body image perceptions of indigenous Australian adolescents compared with their Anglo-European peers in terms of age, gender, culture and body weight status.

Considering that the current prevalence of type 2 diabetes is greater among indigenous than among non-indigenous youth [10, 11] and that there is a high frequency of other health inequities facing this priority population group [21], it is important to examine the juxtaposed information regarding body image, weight status and ethnicity. Body image discrepancies occur cross-culturally, and their clarification could be a vital key in assisting public health professionals to address the imbalance in health education facing our young indigenous populations. Gaining a comprehensive understanding of how indigenous adolescents perceive body weight and obesity would assist health and education professionals to better approach these issues among these specific population groups.

Methods

Quantitative survey data were collected as part of the National Youth Cultures of Eating Study, conducted in 2006 [22], which was a 3-year Australian Research Council (ARC)-funded study of health, eating, weight and culture among 7889 school children from every Australian state and territory. The survey was carried out in 47 randomly selected primary and secondary schools including government, Catholic and private schools. Schools were located in metropolitan, regional and rural regions, but no remote Aboriginal communities were studied. The larger study aimed to examine the intersection of class, gender, age and ethnicity as major factors affecting obesity, body image, food consumption and its meanings.

Participants

Of the 7889 participants in the national study, 4367 were adolescents aged 12–16 years of Anglo-European background and 333 were of indigenous
(Aboriginal/Torres Strait Islander) background. Data from students of other cultural backgrounds (e.g. Asian, Southern European, Middle Eastern, African, Pacific Islander) were not included in the current comparison, as the numbers in each group were too low to allow for analysis by gender. A description of the indigenous and Anglo/Caucasian participants is given in Table I. SES of the schools was categorized as low, middle or high SES according to state department of education indices and a parental income survey [23], and the SES of each school was confirmed by each state department of education and by the school principal.

**Instruments**

The questionnaire [22] measured sociodemographic details such as ethnicity, age, gender and school year along with weight perceptions, body image, desired weight, weight control behaviours and many other nutrition- and food-related questions. A detailed description of the study methods and variables is given elsewhere [22]. In the current study, body image was measured using a categorical item: ‘Do you think you are too thin (1), about right (2) or too fat (3)?’; and desired body weight was measured by asking, ‘What is your desired body weight? A little lighter (1); a lot lighter (2), present weight (3), a little heavier (4), a lot heavier (5).’ Weight control behaviours and attitudes were assessed by asking yes/no questions relating to current (within the past month) dieting to lose or gain weight, building up their bodies, developing muscles, and attitudes towards exercise and fitness. Weight- and exercise-related advice that participants reported receiving were assessed by a yes/no item asking, ‘People tell me I: should lose weight; should build up my body; should do more exercise; do not eat enough’ or that ‘I do too much exercise; do not eat enough or eat too much’. The Body Appearance Rating [24] was used to assess perception of physical appearance using a self-rating score from 0 to 10 (10 being ‘perfect’) for how participants rate their own body appearance (self) and their perceptions of how ‘friends’, ‘other people’, ‘opposite sex’, ‘their mother’ or ‘their father’ would rate them. This instrument has been successfully validated against several scales on the Eating Disorders Inventory, including the Body Dissatisfaction and Drive for Thinness scales [25], with significant ($P < 0.001$) negative Spearman correlation coefficients of between .55 and .67.

**Procedure**

The questionnaire was administered as a self-report survey by students and was completed anonymously during class time under the supervision of trained research assistants. Each questionnaire was checked to make sure that every question had been answered and that there were no inappropriate patterns of answers. For example, research assistants were trained to identify students whose literacy was low and these students were given one-on-one assistance to complete the questionnaire. After completion of the questionnaire, students’ height and weight were measured without shoes and in light summer school uniform in a private room by the second author and trained research assistants. Height was measured to the nearest 0.5 cm using a portable stadiometer. Weight was measured to the nearest 0.01 kg using portable Soehnle digital scales with a range of 0–200 kg. Overweight and obesity were defined using the international standard [26]. Completed questionnaires were checked before data entry was initiated. Five questionnaires, all from male students of Anglo/Caucasian background, were excluded from data entry because they were illegible and partially destroyed by the students.

The Youth Cultures of Eating Study was approved by the University of Sydney Human Research Ethics Committee and the department of education in every state and territory. Consent was obtained from the parents and students.

**Statistical analyses**

Chi-square analyses were used to compare differences between categorical data. $t$-tests and/or analysis of covariance controlling for age were used to analyse for differences in numerical data. The data were normally distributed.
Results

A comparison of all participants’ body image, desired weight and weight control perceptions and practices is given in Table II.

The greatest weight satisfaction among all adolescents (39.3%) was reported by Anglo-European males. Data in Table II show that indigenous females were significantly more likely than their non-indigenous peers to be satisfied with their current weight, less likely to desire weight loss and more likely to desire weight gain ($\chi^2 = 32.9$, $df = 2$, $P < 0.001$; Table II). The indigenous girls were also more likely to desire weight gain and to be currently trying to build up their bodies ($P < 0.001$; Table II). After collapsing the desired weight categories into ‘heavier’ or ‘lighter’, the indigenous females were less likely than Anglo-European girls to report desired weight loss, with a difference of 59.5 versus 69.2% ($3 \times 2 \chi^2 = 22.9$, $df = 2$, $P = 0.000$).

Indigenous males generally reported being more dissatisfied with their weight than their Anglo-European peers (Table II), with fewer reporting satisfaction with their current weight (25 versus 39%) and more reporting a desire for weight gain ($P < 0.001$). After collapsing the desired weight categories into ‘heavier’ and ‘lighter’, indigenous males were significantly more likely to report desired weight gain, with 34 versus 24.3% wanting to be heavier ($3 \times 2 \chi^2 = 7.49$, $df = 2$, $P = 0.006$). Indigenous males were also more likely to have currently used weight gain behaviours ($P < 0.05$) and behaviours to increase body mass ($P < 0.01$). The weight-related comments participants had received from others are outlined in Table III.

Advice was reported by participants of both indigenous and Anglo-European background as coming from mothers, parents, grandparents and other family members. Indigenous females were more likely than Anglo-European females to report receiving advice to build up their bodies ($P < 0.001$). Indigenous males were significantly more likely than Anglo-European males to receive all forms of weight-related advice with the exception of advice to eat less.

The weight status of female participants as percent obese, overweight, normal weight or underweight, respectively, was as follows: Indigenous females ($n = 170$) 9.1, 18.3, 68.9 and 3.7, and Anglo-European females ($n = 2201$) 4.8, 19.0, 71.3 and 4.9. Indigenous females were more likely to be obese compared with Anglo-European females (9.1 versus 4.8%), but the difference was not statistically significant ($2 \times 4 \chi^2 = 6.42$, $df = 3$, $P = 0.09$).

### Table I. Description of indigenous and Anglo-European participants by age, gender, socioeconomic status and school year

<table>
<thead>
<tr>
<th></th>
<th>Females ($n = 2371$)</th>
<th>Males ($n = 2329$)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Indigenous ($n = 170$)</td>
<td>Anglo-Euro ($n = 2201$)</td>
</tr>
<tr>
<td><strong>Age in years, mean (SD)</strong></td>
<td>14.09 (1.57)</td>
<td>13.84 (1.53)</td>
</tr>
<tr>
<td><strong>Socioeconomic status (SES), % ($n$)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low SES</td>
<td>34.3 (58)</td>
<td>18.1 (398)</td>
</tr>
<tr>
<td>Middle SES</td>
<td>57.0 (97)</td>
<td>61.8 (1360)</td>
</tr>
<tr>
<td>High SES</td>
<td>8.7 (15)</td>
<td>20.1 (442)</td>
</tr>
<tr>
<td><strong>School year</strong></td>
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<tr>
<td>Year 6</td>
<td>19.2 (33)</td>
<td>11.9 (262)</td>
</tr>
<tr>
<td>Year 7</td>
<td>21.5 (37)</td>
<td>23.4 (515)</td>
</tr>
<tr>
<td>Year 8</td>
<td>20.9 (36)</td>
<td>19.8 (436)</td>
</tr>
<tr>
<td>Year 9</td>
<td>19.2 (33)</td>
<td>20.6 (453)</td>
</tr>
<tr>
<td>Year 10</td>
<td>13.4 (23)</td>
<td>18.8 (414)</td>
</tr>
<tr>
<td>Year 11</td>
<td>5.8 (10)</td>
<td>5.5 (121)</td>
</tr>
</tbody>
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***$P < 0.001$. 

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The weight status of male participants as percent obese, overweight, normal weight or underweight, respectively, was as follows: indigenous males \((n = 163)\) 7.2, 21.4, 67.5 and 3.9, and Anglo-European males \((n = 2166)\) 6.9, 19.5, 70.0 and 3.6. Indigenous males were more likely to be

| Table II. Comparison of body image, desired weight and weight control perceptions and practices among male and female adolescents from indigenous and Anglo-European backgrounds |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                   | Indigenous \((n = 170)\) | Anglo-Euro \((n = 2201)\) | Indigenous \((n = 163)\) | Anglo-Euro \((n = 2166)\) |
| Body image                        | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       |
| Too thin                          | 6.0 10 4.0 88    | 2.99             | 12.3 20 8.6 184  | 3.44             |
| About right                       | 72.9 121 70.1 1522 | 71.2 116 77.0 1640 | 8.6 14 71.6 1600 | 6.96             |
| Too fat                           | 21.1 35 25.9 562 | 16.6 27 14.3 305 | 18.6 30 20.0 345 | 6.34             |
| Desired weight                    | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       |
| A lot heavier                     | 1.8 3 0.6 13    | 10.0\*           | 5.6 9 1.5 33     | 31.06***         |
| A little heavier                  | 6.5 11 5.4 118  | 28.4 46 22.8 486 | 6.4 11 3.4 16     | 2.87             |
| Same as present                  | 32.1 54 24.8 540 | 25.9 42 39.3 839 | 63.8 105 45.5 90  | 18.7             |
| A little lighter                  | 42.9 72 52.1 1135 | 29.0 47 31.0 663 | 65.6 109 51.5 106 | 7.59             |
| A lot lighter                     | 16.7 28 17.1 373 | 11.1 18 5.4 115  | 70.3 107 32.0 59  | 4.96             |
| Weight control behaviours         | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       |
| Diet to lose weight               | 37.5 63 38.3 832 | 0.04             | 24.4 39 19.0 382  | 3.50             |
| Diet to gain weight               | 3.1 5 2.4 49    | 0.35             | 12.9 20 7.2 150  | 6.54\*           |
| Currently trying to lose weight   | 40.2 68 39.3 859 | 0.54             | 23.3 38 20.7 444  | 0.61             |
| Currently trying to gain weight   | 6.0 10 3.2 70    | 3.56             | 17.9 29 10.7 228  | 7.98**           |
| I want to build up my body        | 39.1 66 27.4 595 | 10.44**          | 69.8 113 64.2 1370 | 2.30             |
| I feel I should develop my muscles| 46.4 77 41.6 907 | 1.46             | 82.0 132 75.9 1623 | 3.06             |
| I need to build up my body        | 36.7 61 26.6 578 | 7.98**           | 71.0 115 58.5 1250 | 9.71**           |
| I need to do more exercise        | 64.9 111 69.8 1520 | 1.80             | 59.3 96 52.0 1113 | 3.15             |
| I am currently trying to get fitter| 78.1 132 77.9 1695 | 0.01             | 73.9 119 72.0 1538 | 0.28             |

*\(P < 0.05\), **\(P < 0.01\), ***\(P < 0.001\).

| Table III. Comparison of the weight-related advice received from others among indigenous and Anglo-European adolescent males and females |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                   | Indigenous \((n = 170)\) | Anglo-Euro \((n = 2201)\) | Indigenous \((n = 163)\) | Anglo-Euro \((n = 2166)\) |
| People tell me                   | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       | \(\chi^2\)       |
| I should lose weight             | 19.0 32 14.8 322  | 2.24             | 19.1 31 12.0 257  | 6.93**           |
| I should build up my body        | 20.2 34 9.9 215  | 17.7***          | 40.7 66 23.9 511  | 22.87***         |
| I should do more exercise        | 43.5 74 37.2 813  | 2.67             | 39.8 64 29.2 626  | 7.95**           |
| I do too much exercise           | 9.5 16 9.7 213    | 0.01             | 19.0 31 8.8 188  | 18.5***          |
| I do not eat enough              | 21.8 37 21.0 459  | 0.05             | 21.6 35 12.6 269  | 10.76**          |
| I eat too much                   | 22.3 38 16.4 356  | 3.79             | 24.8 40 18.6 396  | 3.74             |

*\(P < 0.05\), **\(P < 0.01\), ***\(P < 0.001\).
obese, overweight and underweight compared with Anglo-European males, but the difference was not statistically significant ($2 \times 4 \chi^2 = 1.45, df = 3, P = 0.89$).

Table IV displays the body image perceptions and desired weight of obese male and female participants of both indigenous and Anglo-European backgrounds. There were no statistically significant differences in body image or desired weight between obese participants from indigenous or Anglo-European backgrounds.

A comparison of the physical appearance scores in obese males and females after controlling for age is shown in Table V. There were no statistically significant differences in physical appearance scores between obese female participants from indigenous and Anglo-European backgrounds. Among obese males, there was an observable trend towards indigenous males rating themselves consistently higher on all scales than the Anglo-European males, and this reached statistical significance on the father scale ($P < 0.04$).

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**Discussion**

This study investigated the perceptions of body image among Australian indigenous adolescents and their Anglo-European peers. There was some variation of the body ideals among indigenous and non-indigenous participants with the desire for weight loss being lower among indigenous girls compared with their white peers. Interestingly, the desired body ideal of both the female and the male indigenous adolescents was to be bigger and more ‘built up’ than their current weight. This consistent finding suggests that today’s generation of Australian indigenous adolescents may be more likely than others to desire ‘bigness’, muscularity, robustness and a certain degree of fatness, which is also encouraged by their parents, grandparents and older family members. Further qualitative research is required among indigenous adolescents to explore the current meaning of ‘building up’ their bodies, as it cannot be strictly assumed that the students were indicating a desire for muscularity. The finding that some boys desired both weight loss and weight gain does suggest that the type of weight gain desired was muscle.

The findings confirm expectations that indigenous adolescents within developed countries such as Australia, New Zealand, Canada, the United States and the Pacific Islands, in which the present food supply is relatively secure and plentiful, desire and encourage the development of a bigger, more muscular body [1, 2, 12]. In the current study, this attitude was encouraged by many of the indigenous parents and relatives—but it was also very clear that the adolescents certainly do not desire obesity. This strong desire for slim, big and muscular bodies was significantly greater among indigenous males, who were more likely to be dissatisfied with their bodies than their non-indigenous counterparts. Previous research suggests that the desire for weight gain and body building is a desire for greater muscularity [27], and among indigenous cultures, it is known to reflect a desirable work ethic, avoidance of laziness and the ability to care for the community [27]. In the current study, the further investigation of this construct and the advice adolescents received from indigenous parents and grandparents would be a valuable addition to the research base, as it would help to clarify whether the young people were receiving accurate or sensible information related to their body size, weight and health.

The perceptions of the adolescents in this study tended to align with the advice they received from their parents and relatives regarding their body size, shape, and their eating and exercising behaviours. Furthermore, the combined perceived influence of relatives was generally greater for indigenous males than their non-indigenous counterparts. On average, a quarter of indigenous boys regularly received advice from their parents about weight-related issues. Positive encouragement and feedback from parents is found to potentially buffer some of the negative sociocultural messages and help adolescents to develop and maintain a healthy body image [28]. Furthermore, young females who have positive relationships with both parents report fewer eating and weight concerns [29]. These findings are consistent with the positive impacts of indigenous family ties and could explain why indigenous Australian adolescents...
adolescent girls appear to report less body dissatisfaction than non-indigenous girls of the same age [30, 31]. Much of this research surrounding parent–child relationships focuses on females, and it is also noted that little is known about the parents’ role in the development of body image among males [31]. Further research should investigate these issues.

An interesting finding among the indigenous girls in the current study was the greater desire for bigness, the lesser perception of themselves as ‘too fat’ and a lesser desire for thinness. This finding is in keeping with studies of African American girls in the United States [1, 2, 32, 33] and studies of indigenous Fijians [27] and Pacific Islanders [34, 35] who positively associate bigness and muscularity with strength, success and desirable reflections of ‘attitude’. Australian indigenous females were found to have a more accepting positive attitude towards their body size and shape, with less desire for thinness than their non-indigenous counterparts. Our findings are also surprisingly similar to the results of a recent study of indigenous youth from the state of Montana in the United States [12], which examined, among other variables, the

| Table IV. Body image and desired weight of obese adolescents from indigenous and Anglo-European backgrounds |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Females (n = 114) | Males (n = 158) |
| Indigenous (n = 15) | Anglo-Euro (n = 99) | Indigenous (n = 11) | Anglo-Euro (n = 147) |
| Body image | % | n | % | n | % | n | % | n |
| Too thin | 0.0 | 0 | 0.0 | 0 | 1.4 | 2 |
| About right | 30.8 | 4 | 16.3 | 16 | 45.5 | 5 | 34.0 | 50 |
| Too fat | 69.2 | 9 | 83.7 | 82 | 54.5 | 6 | 64.6 | 95 |
| Desired weight | 2.89 | | | | 3.05 | | |
| A lot heavier | 0.0 | 0 | 0.0 | 0 | 9.1 | 1 | 2.7 | 4 |
| A little heavier | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 4.8 | 7 |
| Same as present | 7.7 | 1 | 1.0 | 1 | 0.0 | 0 | 8.2 | 12 |
| A little lighter | 38.5 | 5 | 38.1 | 37 | 45.5 | 5 | 52.4 | 77 |
| A lot lighter | 53.8 | 7 | 60.8 | 59 | 36.4 | 4 | 32.0 | 47 |

| Table V. Comparison of physical appearance scores among obese male and female adolescents of indigenous and Anglo-European backgrounds |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Obese females (n = 114) | Obese males (n = 159) |
| Indigenous (n = 15) | Anglo-Euro (n = 99) | Indigenous (n = 11) | Anglo-Euro (n = 147) |
| Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Self-score | 5.00 | 3.11 | 4.92 | 1.94 | 0.09 | 0.76 | 6.00 | 2.57 | 5.27 | 1.94 | 1.41 | 0.24 |
| Other people score | 4.38 | 3.14 | 4.44 | 2.17 | 0.01 | 0.93 | 5.36 | 2.87 | 4.83 | 1.99 | 0.72 | 0.40 |
| Physical appearance scores | 3.69 | 3.35 | 3.76 | 2.08 | 0.01 | 0.97 | 5.18 | 3.13 | 4.63 | 2.45 | 0.41 | 0.53 |
| Opposite-sex score | 7.62 | 3.29 | 7.73 | 2.41 | 0.01 | 0.97 | 8.18 | 2.96 | 7.24 | 2.44 | 1.66 | 0.20 |
| Mother score | 6.62 | 4.03 | 7.28 | 2.86 | 0.39 | 0.54 | 8.00 | 2.10 | 6.36 | 2.75 | 4.11 | 0.04 |

*P < 0.05.
correlation of concerns about weight between adolescent Native Americans and adolescent whites. Their study reports a similar desire for a larger body size among the Native American girls, just as our study found among indigenous adolescents. Approximately 10% of the girls from more traditional cultures in both studies reported a desire for a heavier body weight, compared with 5% among girls from a more Westernized acculturated background.

One of the explanations for these findings is the suggestion that the impact of Westernized cultural ideals of slimness has not completely permeated traditional cultures such as those experienced by less ‘acculturated’ young Native American and Australian Aboriginal youth. More traditional indigenous peoples in the Pacific continue to perceive a bigger body weight as well fed, strong, healthy and desirable [27, 34, 35]. The acceptance of a larger body size among adolescents from indigenous backgrounds may be explained by traditional cultural differences in diet, family eating patterns, family structure [27]; cultural norms in the meaning of eating behaviours [36–39] and the role of women in food preparation, feeding and nurturing [34]; and cultural beliefs, values, and practices regarding food, eating, feasting, weight and health [35].

It was interesting but not surprising to observe a greater level of perceived approval from the parents of the obese indigenous boys. Bigness, fatness and health are known to be desired among earlier generations of traditional and indigenous cultures including Aboriginal Canadians [40], Native Americans [41] and peoples indigenous to the South Pacific Islands [27, 34, 35] whose elders have differing perceptions of obesity and are likely to have experienced hunger, food insecurity, famine and child malnutrition [40, 41].

For example, indigenous Pacific Islander women associate a large body size with health, strength, nurturance and attractiveness [27]. In one study of indigenous Fijian women, the most obese figures on a body silhouette scale were rated as representative of high quality of family and community care, whereas the thin figures were perceived as neglected and poorly cared for [27]. The majority of earlier studies with indigenous women from Samoa, Tonga, Cook Islands, New Zealand and/or Fiji have indicated that the older women prefer larger ideal body sizes [34, 35]. Of particular relevance is a study indicating that older generations of obese and overweight indigenous Fijian women believe they should maintain their weight and their strength [27].

The inclusion of parents and grandparents should be encouraged in the planning of health education and obesity prevention messages targeted at indigenous children and adolescents in order to present consistent and culturally appropriate messages about the development of a healthy lifestyle among youth. Health educators must be careful not to promote any further body dissatisfaction among indigenous youth. This field of research should be further investigated to clarify the relationship between weight status, weight perceptions and the efficacy of nutritional therapies, such as diabetes education, among indigenous youth.

The current study has several strengths including a large nationally representative sample of adolescents from public, private and Catholic schools across Australia; accurately measured height and weight, and the use of standardized instrumentation. Limitations of the study include the lack of data from indigenous adolescents from very remote communities in Australia and the lack of a clear definition for building up their bodies. A qualitative study among Australian adolescents is being planned to address these issues.

Nevertheless, the findings from the areas researched in this study, in conjunction with those from previous studies in the United States [1, 2, 12, 32, 33, 41], Canada [40] and the Pacific Islands [27, 34, 35] have relevance about how health education experts should plan, program and deliver healthy lifestyle messages among this generation of indigenous youth in order to promote health and prevent obesity while making certain to do no harm [42] to the self-perceptions and current dietary behaviours of adolescents.

There is some evidence to suggest that adverse effects have already been produced as studies of disordered eating and body dissatisfaction among adolescents in the United States have shown a greater degree of problem eating behaviours among
indigenous youth [12, 43–45], and hence the need to properly address the most culturally relevant, safe and suitable health education and obesity prevention initiatives among young indigenous youth. The desire for larger body weight in indigenous cultures throughout the world can lead to obesity and health problems like the risk of type 2 diabetes. The task ahead is to determine how to focus on promoting a healthy lifestyle among indigenous youth groups, so that health educators can reinforce positive perceptions about health without inadvertently creating body image problems or contradicting or undermining the support and advice from family members and adolescent peer groups.

One important observation from the current findings—that older family members may approve of and encourage over eating and fatness—requires health professionals and educators to seriously rethink their strategies about how to send positive health messages to indigenous adolescents and children. In order to preserve family integrity, it is clear that there is an urgent need to engage parents and older family members in a process of consultation, either in conjunction with programs of health education in schools or, ideally, before such community programs are designed and implemented. Without engaging and educating the parents and grandparents, conflicting messages will continue to impede the health education process. Nothing is gained by alienating family members. The findings show that the messages received within these indigenous groups of adolescents are different from their Anglo-European peers in this respect. So it must be considered that integral family- and community-based education is a vital key to successful health outcomes.

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Conflict of interest statement

None declared.

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