

Gender, ethnicity, culture and social class influences on childhood obesity among Australian schoolchildren: implications for treatment, prevention and community education

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Abstract

The aim of the study was to explore the associations between obesity, weight perceptions and gender, ethnicity, culture and social class in a large national study of Australian school children. Primary and high schools ($N = 47$) were recruited from every state and territory of Australia and included 7889 children from government, private and Catholic schools (82% response rate) in August–November, 2006. The socioeconomic status (SES) of schools was based on a government survey of total family income. A questionnaire completed by students, measured demographic details of gender, age, weight perceptions and ethnic/cultural background. Height and weight were measured by trained research assistants. Outcome measures included body mass index (BMI), prevalence of obesity, overweight, weight perceptions. Prevalence of obesity was 6.4% of males and 5.6% of females in primary school students ($P = 0.34$). More high school males were obese than females (7.7% vs. 5.7%, $P = 0.001$). Obesity was more prevalent among students from Pacific Islander backgrounds. Adolescents who were most likely to be obese were boys and girls of low SES or Pacific Islander or Middle Eastern/Arabic background. The least likely to be obese were Anglo/Caucasian or Asian students and in particular, the girls. Obese female adolescents from Aboriginal, Middle Eastern/Arabic and Pacific Islander backgrounds were less likely than their Caucasian or Asian peers to perceive themselves as 'too fat'. Those working in clinical, community or educational settings with young people and in particular, obese young people, should be aware that obesity is likely to be more prevalent, more culturally acceptable and perhaps more desirable among children and teens from low SES communities and/or Middle Eastern and Pacific Islander backgrounds. Health and social work professionals should be careful not to exaggerate the risks of overweight or obesity or inadvertently create weight concerns among young people. The different body image perceptions identified in this study should be taken into account when planning clinical, community or preventive initiatives among children or adolescents from varying ethnic groups.

Keywords: adolescents, body image, children, culture, ethnic, obesity

Accepted for publication 10 December 2007

Introduction

Childhood obesity prevention has rapidly become one of the most controversial topics in current community, clinical and school health education debates. There is much talk of a global 'epidemic' of obesity in the academic

literature [WHO (World Health Organization) 2003] as well as in the popular media. Some exclaim that the so-called 'epidemic' of childhood obesity will be 'modernity's scourge' (Waters & Baur 2003) and may reverse the observed improvements in life expectancy trends (Olshansky *et al.* 2005), while others more cautiously

argue that current social comment about obesity is based on moral issues rather than true health risk (Gard & Wright 2001, Rich & Evans 2005, Campos *et al.* 2006). Others observe that children and adults can be both 'fat and fit' (Blair 2005, Telford 2007) and that the health risks of fatness may be largely over-ridden by physical activity. An important message for health professionals and social workers is to 'First, do no harm' when working towards obesity prevention and type 2 diabetes prevention among children (O'Dea 2004, Ikeda *et al.* 2006). This is a particularly salient message for those working among different ethnic and cultural groups in the community.

Among the hundreds of published articles about childhood obesity, there is a marked paucity of comment from the children themselves, and very little input invited from their parents (O'Dea 2005). In one of the few studies of the sociocultural contexts within which young people become fat and lay conceptualizations of fatness, Wills *et al.* (2006) interviewed obese and overweight teenagers from socially disadvantaged areas in Scotland. In this study, the researchers found that these young people of low socioeconomic status (SES) had a high degree of body acceptance and rarely mentioned any health-related consequences of their fatness. Of weight-related importance to these young people were fashion-related issues and being physically 'slowed down'.

The importance of identifying cultural and ethnic issues in the management and prevention of weight-related disease has been recognised by several authors and is well illustrated in a recent study of Pakistani and Indian patients with type 2 diabetes, conducted by Lawton *et al.* (2006) in the UK. This study found that issues of social role, familial duties, perceived family cohesion and other issues related to the social roles of men and women in East Asian communities in the UK were much more highly valued than self-care. The authors of this study state that 'Education may play a role in physical activity promotion; however, health promoters may need to work with, rather than against, cultural norms and individual perceptions'.

This article aims to explore the associations between obesity, weight perceptions and gender, ethnicity, culture and social class in a large national study of Australian school children. The study also explores the social and cultural issues around weight and fatness among children in regard to how these influences may affect the plans and approaches of social workers and community health promoters.

In any discussion of weight, it is important to first understand the definitions, meanings and limitations of the measurement instruments. The strict definition of 'obesity' refers to 'overfatness' and is normally defined using some sort of measure of per cent body fat such as skinfold thickness standards. Because of the costly,

time-consuming and invasive nature of these measures, most researchers undertaking large population studies of 'obesity' are necessarily required to use a proxy for obesity and overweight as defined by a measure of weight-for-height, the body mass index (BMI), a measure of weight in kilograms divided by the square of height in metres. Many studies, including our current one, employ a general 'international childhood BMI standard' which has been developed by Cole *et al.* (2000). The international standard creates a statistical distribution of BMI by extrapolating the childhood BMI distribution to track childhood and adolescent BMI equivalents to adult BMI cut-off points of overweight (adult BMI of 25 or more to 29.9) or obese (adult BMI of 30 or more). Hence, the current international definition of childhood overweight and obesity is essentially a statistical definition of weight-for-height and gender, and not body fatness per se. BMI is a screening tool, useful for making surveillance observations, but it is not a diagnostic tool and children with a BMI indicating obesity or overweight do not necessarily have any illness, clinical complications, or health risks associated with overfatness. More in-depth clinical assessment of individual children is required to ascertain their current health status and their future health risk (Flegal *et al.* 2006). Nevertheless, the current definitions of overweight and obesity are generally used working definitions that are valuable for public health surveillance, screening and community assessment.

Using such a standard, the prevalence of childhood overweight, obesity and increases in these over time have been measured in various countries to date. In the USA, the prevalence of childhood obesity has tripled since the 1960s with a low prevalence of about 3% in the 1960s to about 7–10% in the 1980s and 1990s (Flegal *et al.* 2001). The current prevalence in the USA is estimated at around 15% (Ogden *et al.* 2006).

In the UK, analyses of three cross-sectional studies of British children between 1974 and 1994 resulted in similar upward trends in childhood obesity prevalence to those observed in the USA (Chinn & Rona 2001). Increasing prevalences have been observed in Australia (Magarey *et al.* 2001), France (Heude *et al.* 2003, Romon *et al.* 2005), Finland (Kautiainen *et al.* 2002), Portugal (Padez *et al.* 2004), Chile (Kain *et al.* 2002), Germany (Kalies *et al.* 2002), Brazil, China and Russia (Wang *et al.* 2002).

Although the imminent risk of any illness in obese children is not considered common (Flegal *et al.* 2006), the risk for the development of insulin resistance and type 2 diabetes is considered much more likely and serious with some cases of adolescents with these conditions already being diagnosed (Fagot-Campagna *et al.* 2000). The vast majority of such cases, although small in actual number, have been diagnosed among very obese

and very sedentary adolescents (Drake *et al.* 2002), with a strong family history of type 2 diabetes who often come from Indian, Pakistani (Ehtisham *et al.* 2000) or African American or Native American backgrounds (American Diabetes Association 2000). Similarly, about half of the 43 cases of type 2 diabetes and related conditions identified over the 12 years from 1990 to 2002 in children and adolescents in Western Australia were found among Aboriginal children (McMahon *et al.* 2004). A recent study of all medical register data on type 2 diabetes in children and adolescents aged 7–18 years in the state of New South Wales (Craig *et al.* 2007) found 128 cases over the 6 years from 2001 to 2006 (about 21 cases each year). The authors reported that 90% of cases were overweight or obese. Aboriginal children were six times more likely to have type 2 diabetes than their non-indigenous peers and 75% had a family history of the disease. Although these ethnic and familial effects on type 2 diabetes risk are not always apparent (Wiegand *et al.* 2004), they remain an important consideration.

Hence, the study of childhood obesity and its implications for child health in our communities should currently include an assessment of gender, risk of actually developing any illness, and ethnicity.

Methods

Data in this study were collected as part of the National Youth Cultures of Eating Study which is a 3-year, government-funded study of health, weight, culture and eating among nearly 8000 school children from every state and territory of Australia in 2006. The major aim of our study is to examine the intersections of class, gender, age and ethnicity as major factors affecting obesity, body image, food consumption and its meanings.

The questionnaire was constructed from previously validated instruments (Gracey *et al.* 1996, O'Dea & Wilson 2006) and completed by students during regular class times under the supervision of trained research assistants. The questionnaire measured demographic details of gender, age, ethnic background, weight perceptions [Do you think you are too thin (1), about right (2) or too fat (3)?], as well as many other food and nutrition-related questions. Participants were able to self-select their ethnic/cultural background(s) from the following categories: Anglo/Caucasian; Aboriginal/Torres Strait Islander; southern European/Mediterranean; Chinese/Southeast Asian; Middle Eastern/Arabic; Pacific Islander; Indian; African and other. The details of the questionnaire have been described elsewhere (O'Dea & Wilson 2006). Height and weight were measured by trained research assistants.

Completed questionnaires were checked, edited, entered and cleaned to produce an spss data file.

Descriptive chi-squared analyses were undertaken to provide details of the prevalence of obesity and overweight using the international standard with age in years taken to the 0.5 years cut-offs (Cole *et al.* 2001). Chi-squared analyses were used to examine group differences in prevalence of overweight and obesity between various ethnic and social class subgroups of children and adolescents. BMI was analysed as the dependent variable using ANOVA performed separately for boys and girls with age as a covariate and ethnicity and SES as independent variables. All continuous data were checked to make sure they were normally distributed. Residuals were examined for normality, linearity and homoscedasticity and these assumptions were met.

The study was approved by the University of Sydney Human Ethics committee as well as each of the Departments of Education in every state and territory of Australia. All students with informed parental consent were eligible to participate and each student's verbal consent was obtained on the day of the study. No follow-up visits were undertaken.

Results

A total of 47 randomly selected primary and high schools were recruited from every state and territory of Australia and included 7889 children from government, private and Catholic schools. A total of 34 out of the final 47 schools had participated in the 2000 survey (O'Dea & Wilson 2006) and another 13 schools were approached in 2006 with all school principals agreeing to participate. Data were collected between August and November, 2006 with an 82% response rate. The SES of schools was based on a written questionnaire of all families attending the school. Schools were categorised as being of low or middle/high SES based on a direct federal government measurement of parental income (Commonwealth Department of Education 2005). Total family income was assessed with 21.9% of participants from low SES schools; 58.1% middle SES schools and 20.0% high SES schools. These SES categories were confirmed in an interview with each of the school principals in order to verify the SES of the majority of children attending the school.

Adequate numbers of participants were recruited from Anglo/Caucasian (72.2%); Aboriginal/Torres Strait Islander (5.9%); southern European (8%); Chinese/Southeast Asian (7.4%); Middle Eastern/Arabic (1.9%) and Pacific Islander (2.4%) backgrounds and these have been included in the analyses. Ethnic categories of students from African, Indian and 'other' backgrounds were omitted in analyses because of low numbers.

Analysis of obesity by gender produced no statistical differences in primary school children aged less than

12 years with 6.4% of males and 5.6% of females obese ($\chi^2 = 2.16$, d.f. = 1, $P = 0.34$). Analyses among high school students aged 12 years or older found more males were obese than females (7.7% vs. 5.7%, $\chi^2 = 9.13$, d.f. = 1, $P < 0.001$).

The prevalences of obesity, overweight and normal weight by age group gender and ethnicity among Australian school children in 2006 are given in Table 1. There was an observable and statistically different variation in obesity prevalence between different ethnic and cultural groups. Results of chi-squared analyses were highly significant ($\chi^2 = 134.2$; d.f. = 10; $P < 0.001$). There were also significant differences in obesity prevalence by ethnicity within combinations of age group and gender; differences were more marked among 12–18 year olds. Obesity was significantly more prevalent among boys and girls of all ages from Pacific Islander backgrounds. Among adolescents, those who were most likely to be obese (4–5 times more likely, $P < 0.001$) were boys and girls of Pacific Islander or Middle Eastern/Arabic background. The least likely to be obese in both genders and all age groups were the Anglo/Caucasian or Asian students and in particular, the girls. Clearly, obesity among Australian school children is largely affected by ethnic and cultural factors.

Further analysis of the data also suggests a social class effect (Table 2).

The clearly graded trend in obesity, overweight and SES among both primary and secondary school children suggests an influence of social class indicators upon their weight status with those of lower SES having a consistently greater prevalence of obesity than their higher SES peers ($\chi^2 = 25.3$; d.f. = 2; $P < 0.001$).

The results of ANOVA are illustrated in Figures 1 and 2.

Among girls (Figure 1) and after controlling for age, BMI was greater among those from Middle Eastern and Pacific Islander backgrounds compared to girls from other ethnic groups ($F = 10.46$; d.f. = 5/3992; $P < 0.001$). Girls of low SES had a generally greater BMI than girls of middle or high SES ($F = 6.22$, d.f. = 2/3984; $P = 0.002$).

Among boys (Figure 2) and after controlling for age, BMI was greater among those from Middle Eastern/Arabic and Pacific Islander backgrounds compared to boys from other ethnic groups ($F = 5.78$; d.f. = 5/3758; $P < 0.001$). Within ethnic groups, boys of low SES had a generally greater BMI than boys of middle or high SES ($F = 3.92$; d.f. = 2/3759; $P = 0.02$).

Weight perception among obese children from different cultural and ethnic backgrounds

The weight perception of children from different ethnic backgrounds was a crucial part of our analyses. There

Table 1 Prevalence of obesity, overweight and normal weight by age group gender and ethnicity among Australian school children in 2006

	Anglo/Caucasian percentage (n)	Aboriginal/Torres Strait Islander percentage (n)	Southern European percentage (n)	Asian (Chinese, Southeast Asian) percentage (n)	Middle Eastern/Arabic percentage (n)	Pacific Islander/Maori percentage (n)	Chi-squared (obesity × ethnicity, d.f. = 5)	P value
Age group 6–11 years								
Male (n = 1267)								
Obese	5.5 (53)	8.6 (7)	7.4 (5)	9.5 (9)	10.0 (1)	18.8 (6)	11.5	0.02
Overweight	15.7 (150)	16.0 (13)	13.2 (9)	17.9 (17)	10.0 (1)	21.9 (7)		
Normal weight	78.8 (754)	75.3 (61)	79.4 (54)	72.6 (69)	80.0 (8)	59.4 (19)		
Female (n = 1370)								
Obese	5.5 (55)	6.8 (7)	4.5 (4)	2.0 (2)	13.3 (2)	15.6 (5)	5.9	0.04
Overweight	17.6 (175)	12.6 (13)	23.9 (21)	19.8 (20)	26.7 (4)	15.6 (5)		
Normal weight	76.9 (765)	80.6 (83)	71.6 (63)	78.2 (79)	60.0 (9)	68.8 (22)		
Age group 12–18 years								
Male (n = 2561)								
Obese	7.0 (134)	6.8 (9)	10.4 (20)	5.6 (11)	21.9 (7)	23.6 (13)	33.7	< 0.001
Overweight	19.5 (376)	22.7 (30)	16.1 (31)	13.8 (27)	12.5 (4)	25.5 (14)		
Normal weight	73.5 (1417)	70.5 (93)	73.4 (141)	80.6 (158)	65.6 (21)	50.9 (28)		
Female (n = 2691)								
Obese	4.6 (85)	9.1 (13)	5.8 (17)	2.6 (5)	17.2 (15)	23.4 (15)	70.7	< 0.001
Overweight	19.0 (355)	19.6 (28)	24.1 (71)	9.8 (19)	27.6 (24)	32.8 (21)		
Normal weight	76.4 (1428)	71.3 (102)	70.2 (207)	87.6 (170)	55.2 (48)	43.8 (28)		

Chi-squared for all students (N = 7889) for obesity × ethnicity = 99.6, d.f. = 5, $P < 0.001$.

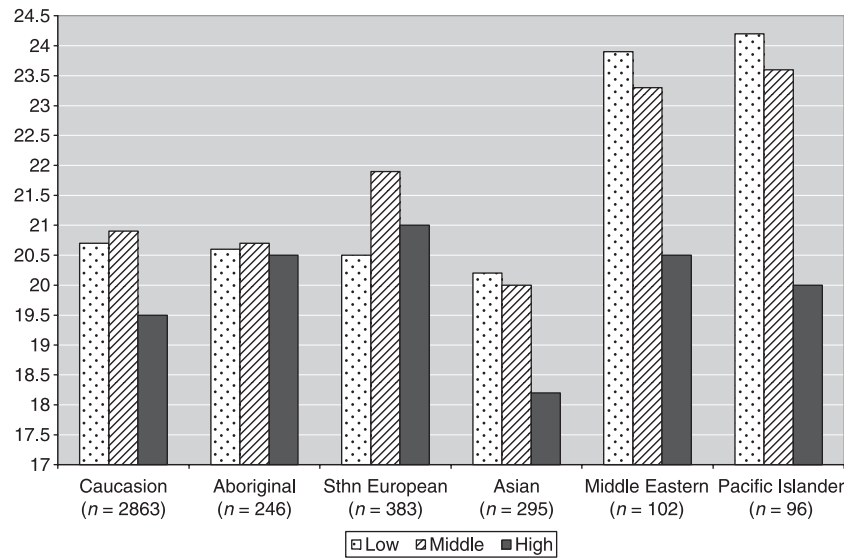


Figure 1 Mean BMI of girls by ethnic background and SES (*N* = 2985).

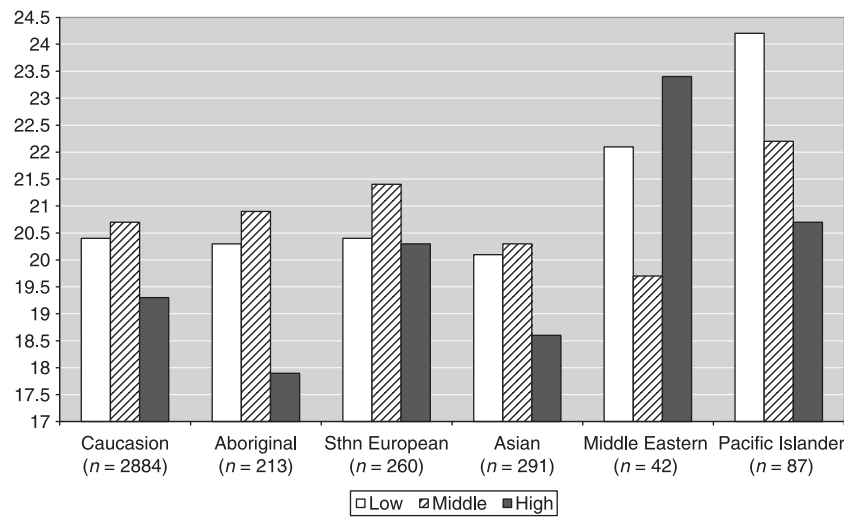


Figure 2 Mean BMI of boys by ethnic background and SES (*N* = 3777).

Table 2 Prevalence of obesity, overweight and normal weight by school SES among Australian school children in 2006

	Low SES (<i>n</i> = 1728)	Middle SES (<i>n</i> = 4583)	High SES (<i>n</i> = 1578)
Obese (<i>n</i> = 509)	8.8 (152)	6.3 (289)	4.3 (68)
Overweight (<i>n</i> = 1458)	19.2 (332)	18.9 (866)	16.5 (260)
Normal weight (<i>n</i> = 5922)	72.0 (1244)	74.8 (3428)	79.2 (1250)

Chi-squared test for trend for obesity × SES = 32.7, d.f. = 1, *P* < 0.001; chi-squared test for obesity × SES = 27.7, d.f. = 2, *P* < 0.001.

were no significant differences in weight perceptions among obese male participants. Among obese males of all ages (chi-squared), the number who perceived themselves to be ‘too fat’ was 58.3% Anglo/Caucasian; 50.0% Aboriginal; 56.0% southern European; 52.6% Asian; 66.7% Middle Eastern and 55.6% Pacific Islander. The remaining percentages of boys perceived their current

weight to be ‘about right’. These differences were not statistically significant ($\chi^2 = 0.3$, d.f. = 5, *P* = 0.83).

Among obese female participants of all ages (chi-squared), the number who perceived themselves as ‘too fat’ was 68.3% of Anglo/Caucasian; 61.1% of Aboriginal; 61.9% of southern European; 100% of Asian; 41.2% of Middle Eastern and 65.0% of Pacific Islanders. The

remaining percentages of girls perceived their current weight to be 'about right'. The differences were not statistically significant ($\chi^2 = 5.1$, d.f. = 5, $P = 0.28$).

This trend towards obese participants perceiving their weight as 'About Right' was similar but more pronounced in boys and girls aged less than 12 years.

Among obese girls aged 12 years or older, the vast majority of girls from Anglo/Caucasian (83.7%) and Asian (100%) backgrounds perceived their weight as 'too fat' but this proportion was lower among obese girls from Aboriginal (72.7%), southern European (70.6%), Middle Eastern/Arabic (40%) and Pacific Islander (73.3%) background who were significantly less likely to perceive themselves as 'too fat'. The majority of obese Middle Eastern/Arabic girls (60%) perceived their weight as 'about right'. The differences between the weight perceptions of ethnic groups of girls were statistically significant ($\chi^2 = 13.7$, d.f. = 5, $P = 0.008$). The differences between obese Anglo/Caucasian girls and Middle Eastern/Arabic, Pacific Islander and Aboriginal girls were all highly significant ($P < 0.001$).

The ethnic difference between the body image perceptions of obese boys was not as clear as those differences among the same grouping of girls. Among obese boys aged 12 years or older, the percentage with a self-perception of 'too fat' was: Anglo/Caucasian (65.7%), Aboriginal (55.6%), southern European (61.9%), Middle Eastern (66.7%) and Pacific Islander (64.3%) boys. The differences between ethnic groups were not statistically significant ($\chi^2 = 0.92$, d.f. = 5, $P = 0.92$).

Chi-squared analyses of the data among obese students by gender, SES and ethnicity revealed no statistically significant differences.

Discussion

The current study investigated the prevalence of obesity and overweight, weight perceptions and patterns of ethnic, gender and social class influences among a large, representative sample of Australian school children in 2006. The strengths of the current study include the large, nationally representative sample size, the inclusion of both ethnicity and SES with a high (82%) response rate and little response bias. The weaknesses include some low numbers in ethnic groups of males from Middle Eastern backgrounds and students from India and Africa as well as the necessity to define SES using school SES rather than an individual measure of SES for each child.

In a dataset from the same survey conducted in 2000 (O'Dea & Wilson 2006), using the international standards (Cole *et al.* 2001), an overall prevalence of 5.1% obesity was found and in 2006 this had increased to 6.4%. In comparison, the level of obesity does not

appear to have increased at all among 6–12-year-old boys and girls of Anglo/Caucasian background or 12–18-year-old girls of Anglo/Caucasian background (Table 1). These findings suggest an ethnic, cultural or racial effect on the risk of obesity among children and adolescents.

Interestingly, although still showing a general upward trend, the overall prevalence of obesity does not appear to have increased dramatically between 2000 (5.1% obese) and 2006 (6.4% obese) among data from students from the same schools (O'Dea 2003, O'Dea & Wilson 2006). There is also a suggestion that the obesity prevalence trend is declining in adolescent girls, especially those of higher SES and this trend has also been recently observed in another large study of school children in New South Wales (Booth *et al.* 2007).

These results obviously need to be further analysed and compared in more detail to determine whether the rise in childhood obesity was statistically significant, ethnically based or related to SES, but the trends in this study suggest that obesity is more common among low SES students and those from Middle Eastern and Pacific Islander backgrounds. The prevalence of obesity in these groups of children was about 20%, which is an astounding number, considering the comparative prevalence among the same-aged children from Anglo/Caucasian backgrounds was around 5–7%. This finding that obesity may be four times greater among certain ethnic groups compared to Anglo/Caucasian children gives rise to current and future concern about the incidence of insulin resistance and type 2 diabetes among these young people.

This current result relates to other reports of type 2 diabetes in children (Ehtisham *et al.* 2000, Fagot-Campagna 2000, Sinha *et al.* 2002, Drake *et al.* 2002, Wiegand *et al.* 2002, Craig *et al.* 2007), wherein the ethnic background of the obese child, together with a family history of diabetes and a sedentary lifestyle largely predicts the prevalence of this pernicious disease. Those working with young people in clinical and community settings would be well advised to monitor obese, inactive children for the risk of type 2 diabetes, especially if there is any family history of the disease.

An interesting finding of the current study was the apparent lack of concern and significant level of body satisfaction among obese children from Middle Eastern and Pacific Islander backgrounds. Among obese boys of all ages, only half considered their weight to be 'too fat'. This may reflect a desire for 'bigness', muscularity, strength or masculinity among boys and young men which has been previously identified (McCreary & Sasse 2000, O'Dea & Caputi 2001, McCreary *et al.* 2005). Further research should be undertaken to establish whether this acceptance of obesity may also reflect social class mores, sporting aspirations or some other

socially derived perception or desire among young males. An obvious limitation of the current study is the lack of qualitative data which we have collected and are currently analyzing and the further exploration of the data is expected to better clarify this finding.

The body image findings among girls were equally surprising and interesting with one-third of the obese Aboriginal, Pacific Islander and southern European girls seeing their weight as acceptable and possibly even desirable. This trend was marked in the obese Middle Eastern girls, two-thirds of whom perceived their weight to be about right and it was glaringly absent in the obese girls from Anglo/Caucasian and Asian backgrounds, with nearly 100% of these girls seeing themselves as 'too fat'. The body image differences of the young people in this study may reflect cultural body ideals (Becker *et al.* 2005), Western ideals of feminine beauty such as the slim ideal (Streigel-Moore & Franko 2002), masculinity (McCreary *et al.* 2005) or socially constructed gender roles (see for example, Cash & Pruzinsky 2002, McKinley 2002). The limitations of the BMI as an instrument of fat measurement among growing children and adolescents must not be excluded as a factor in the determination of these findings, as people from Polynesian backgrounds are known to be tall and muscular (Swinburn *et al.* 1999, Craig *et al.* 2001) and it may be these factors which contribute to their weight for height, in addition to their body fat.

Although the prevalence of childhood obesity has been reported as increasing in Westernised countries over the past three decades (Chinn & Rona 2001, Flegal *et al.* 2006), the limitations in measurement must again be clearly defined. A common, but not necessarily acceptable practice in Westernised countries is to combine children who are overweight together with those who are obese to create a category called 'overweight and obese'. This practice ignores the fact that the categories of overweight and obesity are different because they correlate differently with per cent body fat, health risk and morbidity (Flegal *et al.* 2006). Those working with young people must realise that although it is tempting to 'advertise' such combined statistics in order to draw attention to the health risks of obesity in children, it is not helpful or clinically accurate to combine statistics of overweight children with those who are obese.

For instance, if this limited and very simplistic definition were applied to the current study, the number of children and adolescents from Middle Eastern or Pacific Islander backgrounds who were categorised as overweight and obese would be nearly half. Clearly, this crude and clinically inaccurate measure should not be used to unnecessarily identify, stigmatise, blame or shame large children or their parents (O'Dea 2004, Campos

et al. 2006, Ikeda *et al.* 2006). Such methods of communicating the risk of child illness and potential disease, which may be undertaken quite innocently under the guise of 'patient information' or 'community education', may quite correctly be perceived as racially motivated, prejudiced, divisive and unhelpful among the community groups in which these weight messages are targeted. Likewise, such messages among socially disadvantaged groups may be seen as even more socially marginalizing and victim blaming.

Longitudinal studies of children and adolescents in the USA (Freedman *et al.* 1999) report higher levels of blood pressure, serum lipids and other factors associated with heart disease in adulthood but the actual risk to the child is an assumed future risk rather than a clear, valid or strong marker of current disease, ill health or 'sickness'. Clearly, a fat child is not necessarily a sick child and this commonly held belief in Western societies is more of a myth than a scientific fact. Some would argue that the myth of 'fatness equals illness' is based on moralistic judgments from the protestant work ethic, wherein gluttony and sloth are assumed to reflect moral weakness, laziness and sinfulness. The complete lack of cultural, gender and ethnic input into these narrow viewpoints of presumed 'fatness' is astounding. The results of the current study may assist in a better understanding of the important interplay between these crucial sociocultural variables.

Many cultures value fatness as a sign of family prosperity, fertility and success. Traditional South Pacific Islanders for example, consider 'bigness' or 'obesity' to be desirable, although fewer among the younger generation may hold these cultural perspectives (Becker *et al.* 2005). In order to better explain these phenomena, especially among adolescents of Middle Eastern and Pacific Islander background, we are currently analysing the qualitative focus group data from the current study.

Women and men from Pakistani and Indian backgrounds living in the UK consider the idea of spending time away from family activities and daily duties as 'selfish' and inappropriate irrespective of the urgings from their doctors, nurses and other health professionals for them to undertake physical activity for the benefit of their own diabetes and their health (Lawton *et al.* 2006). It is likely that their children may feel the same and may adhere to similar social roles when they become adults.

Clearly, the challenge for nurses, health educators, community workers and other health professionals is to help people from culturally diverse backgrounds become 'healthier' within a broader context of their personal, family, community and cultural constructs of 'physical, social, mental and cultural health'.

Those working in clinical, community or educational settings with young people and in particular, obese

young people, should be aware that obesity is likely to be more prevalent, more culturally acceptable and perhaps more desirable among children and teens from low SES communities and/or Middle Eastern and Pacific Islander backgrounds. Health and social work professionals should be careful not to exaggerate the risks of obesity among higher SES Anglo/Caucasian or Asian communities as these children do not appear to be at a high risk of obesity and there is the potential to increase the risk of body image problems and disordered eating, especially among females. These different body image perceptions and sociocultural factors should be taken into account when planning clinical, community or preventive health promotion initiatives among children or adolescents from varying ethnic groups.

Acknowledgements

Many thanks to the State Departments of Education and school students who participated in this national study. This study was funded by a grant from the Australian Research Council (ARC) to the University of Sydney, Probyn, E & O'Dea, J. National Youth Cultures of Eating Study, 2005–2007.

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