

Socio-economic differences in eating-related attitudes, behaviours and environments of adolescents

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Abstract

Objective: The aim of the present study was to investigate the relationship between area-level socio-economic status and healthy and less healthy eating behaviours among adolescents and to determine whether the relationship between area-level socio-economic status and dietary behaviours was related to the relevant attitudes and environments.

Design: Data were collected as part of Youth'07, a nationally representative survey of the health and well-being of New Zealand youth.

Setting: New Zealand secondary schools, 2007.

Subjects: A total of 9107 secondary-school students in New Zealand.

Results: Students from more deprived areas perceived more supportive school environments and cared as much about healthy eating as students in more affluent areas. However, these students were significantly more likely to report consuming fast food, soft drinks and chocolates.

Conclusions: Addressing area-level socio-economic disparities in healthy eating requires addressing the availability, affordability and marketing of unhealthy snack foods, particularly in economically deprived areas.

Keywords

Socio-economic position
Adolescents
Fruit and vegetables
Environments

Healthy eating plays a critical role in the prevention of chronic diseases⁽¹⁾ and eating habits established during adolescence may have long-lasting effects. Most notably, the establishment of overweight/obesity during childhood and adolescence is predictive of overweight/obesity into adulthood^(2–4). Inverse socio-economic gradients in the prevalence of obesity^(5,6) and chronic diseases, such as CVD⁽⁷⁾ and some cancers⁽⁸⁾, are documented in many Western countries. Similarly, previous research suggests that less healthy eating behaviours are also related to socio-economic status. For example, adolescents experiencing greater socio-economic deprivation are less likely to eat adequate fruit and vegetables^(9–11) and more likely to consume snack foods and fast food^(9,12), skip breakfast^(13,14), watch television^(15,16) and buy food outside the home⁽¹⁷⁾.

A range of interrelated factors are thought to influence adolescent eating behaviours. These include psychosocial factors (e.g. taste preferences and knowledge), biological factors (e.g. hunger and growth), the social environment (e.g. socio-economic factors, support and media) and the physical environment (e.g. access to fast food and

supermarkets)⁽¹⁸⁾. Previous research has found that taste preferences and home availability of fruit and vegetables are among the most important factors associated with adolescent fruit and vegetable consumption⁽¹⁰⁾. Furthermore, access to supermarkets positively influences fruit and vegetable intake⁽¹⁹⁾. Research has also suggested that school policies can significantly impact on student eating behaviours⁽²⁰⁾. Less is known about how area-level socio-economic gradients in eating behaviours are related to the psychosocial and environmental factors influencing those behaviours. One regional study in Australia found that some of the social cognitive constructs associated with adolescent eating behaviours (e.g. self-efficacy for increasing fruit, social support for healthy eating and food availability in the home) were positively associated with socio-economic position⁽⁹⁾. The aim of the present study was to investigate the relationship between socio-economic status and healthy and less healthy eating behaviours among adolescents and to determine whether the area-level socio-economic relationships in dietary behaviours were related to relevant attitudes and environments.

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Methods

Study design

Data were collected as part of Youth'07, a survey of the health and well-being of New Zealand youth⁽²¹⁾. The Youth'07 survey was a nationally representative survey of high-school students conducted in 2007. The survey aimed to document the prevalence of key health and well-being issues, including nutrition and activity behaviours.

The Youth'07 survey utilized a two-stage sampling design. First, 115 schools were randomly selected for participation from the 389 eligible secondary schools in New Zealand and ninety-six agreed to participate (school response rate 84%). From the participating schools, students were randomly selected from the school rolls for participation. Of the 12 355 students selected, 9107 students agreed (student response rate 74%). The most common reasons for students not participating were being absent from school, being unavailable or declining to take part⁽²¹⁾.

School principals consented to participate on behalf of the Boards of Trustees. Students and their parents were provided with information sheets about the survey. The students themselves consented to participate in the survey. The University of Auckland Human Subject Ethics Committee granted ethical approval for the study. The survey questions and data collection methods were piloted for comprehension and acceptability⁽²²⁾ and refinements were made before data collection.

All data collection took place at school during the school day. Upon arrival at the survey room, students were given an anonymous login code to access the survey. The survey included a 622-item multimedia questionnaire administered on a Nokia Internet tablet and identification of their census meshblock number (based on their residential address) to determine the extent of their neighbourhood deprivation. The multimedia nature of the questionnaire meant that all students could read each of the question and response options themselves, while listening to the questions and responses being read aloud through headphones.

Measures

Age, gender and ethnicity were determined by self-report. Ethnicity was assessed using New Zealand census questions⁽²³⁾ in which participants select all ethnic groups that they identify with. Approximately 40% of students identified with more than one ethnic group⁽²¹⁾. To facilitate statistical analyses, ethnic populations were prioritized in the following order: Māori, Pacific, Asian, Other ethnicity and European.

Students were assigned to a level of small area deprivation by linking their residential meshblock number to the 2006 New Zealand Deprivation Index⁽²⁴⁾. This index assesses eight dimensions of deprivation using 2006 census data, based on small-area geographical units. The index deciles were categorized into three groups

reflecting low deprivation (1–3), middle levels of deprivation (4–7) and high deprivation (8–10).

Eating behaviours

Breakfast (*n* 8789) and lunch consumption (*n* 7888) were assessed with the questions, 'How often do you eat breakfast/lunch?' Responses were categorized into 'always' or 'sometimes/hardly ever'. Family meal consumption was assessed with the question, 'During the past 7 d, how many times did all, or most, of your family living in your house eat a meal together?' Responses were dichotomized as 'five or more times a week' and 'never or one to four times a week'. Fruit and vegetable consumption (*n* 8710) was assessed with three separate questions, 'During the past 7 d, how often did you eat any of the following (fruit/potatoes, kumara, taro, etc./vegetables (not including potatoes, kumara and taro))?' Students were categorized as meeting the recommendation for 'five or more fruit and vegetables a day'⁽²⁵⁾ if they responded that they consumed fruit twice a day or more often and the sum of vegetables and potatoes, kumara or taro three times a day or more often. Fast food/takeaway consumption (*n* 8745) was assessed with two questions, 'During the past 7 d, how often did you eat food from a fast-food place (e.g. McDonalds, KFC, Burger King, Subway, Pizza Hut)/other takeaways or fast-food shops (fish and chips, Chinese takeaways)?' Students were categorized as consuming fast food/takeaways 'four or more times a week' if they responded as such to either of the questions. Consumption of chocolates (*n* 8719), potato chips (*n* 8708) and soft drinks (*n* 8697) was assessed with three items asking, 'During the past 7 d, how often did you eat/drink any of the following (chocolate, sweets or lollies/potato chips, burger rings, twisties, etc./fizzy or soft drinks (e.g. Coke, Sprite and Fanta))?' Responses were dichotomized at 'once a day or more often' and 'less than once a day'. The less healthy behaviours (consumption of fast food, chocolates, potato chips and soft drinks) were dichotomized at the high-frequency categories as it is recognized that these types of foods should not be consumed so frequently.

Eating attitudes and environments

How much students care about eating healthy food (*n* 8672) was assessed with the question, 'How much do you care about eating healthy food?' Responses were dichotomized into 'very much' and 'some, a little, or not at all'. Home availability of fresh fruit and vegetables (*n* 8744)/chocolates and sweets (*n* 8731)/soft drinks (*n* 8706) were assessed by three items asking, 'How often are the following foods available to eat at home (fresh fruit or vegetables, chocolate or other sweets, fizzy drinks)?' Responses were dichotomized at 'usually or always' and 'sometimes or never'. Student perception of school support for healthy eating (*n* 8621) was assessed with the question, 'How much does your school encourage you to

eat healthy food?' Responses were dichotomized as 'very much' and 'some, a little, or not at all'.

Analysis

All analyses were conducted using the survey procedures in the SAS statistical software package version 9.2 (SAS Institute, Cary, NC, USA). Prevalence estimates were derived using bivariate analyses to examine the associations between the variables of interest. Multiple logistic models were conducted to determine the relationship between area-level deprivation and eating behaviours, attitudes and environments, controlling for independent effects of age, gender and ethnicity.

Results and discussion

The associations between demographic characteristics and area-level socio-economic status of the study population are described in Table 1. Male and female participants were equally distributed across the levels of deprivation. There appeared to be fewer older adolescents (aged 15–17 years) in the high-deprivation areas. This may reflect that students attending schools in high-deprivation areas are more likely to leave school early compared with students in more affluent areas⁽²⁶⁾. Pacific and Māori students were over-represented in the high-deprivation areas and this is consistent with previous reports of Pacific and Māori populations in New Zealand⁽²⁷⁾.

Students living in high-deprivation areas were significantly less likely to always eat breakfast and lunch than students living in low-deprivation areas and these relationships were significant when controlling for age, gender and ethnicity (Table 2). However, there were no differences by area-level socio-economic deprivation in the proportion of students who eat five or more fruit and vegetables a day or eat meals with their families.

With regard to the less healthy eating behaviours, students in the high-deprivation areas were consistently more likely to consume fast food, chocolates, potato chips and soft drinks than students in less deprived areas. These findings are consistent with previous research that suggests that socio-economic position is associated with poorer nutrition profiles^(28,29).

Of interest, in the bivariate analysis, students living in the most deprived areas were more likely to meet the recommendation for fruit and vegetable consumption, but when the demographic variables (age, gender and ethnicity) were controlled for, the association was not significant. This finding is inconsistent with the majority of research suggesting that socio-economic position is positively associated with fruit and vegetable consumption⁽³⁰⁾. One possible explanation for this inconsistency may be reflected in socio-cultural factors influencing fruit and vegetable consumption. Previous research in New Zealand has reported higher fruit and vegetable consumption among Pacific children and Māori children, independent of socio-economic position⁽³¹⁾. The lack of association may also reflect recent initiatives targeting obesity prevention in more deprived areas in New Zealand. In 2004, the New Zealand government launched its national strategy for obesity prevention, subsequent to which many health promotion programmes were initiated in more deprived areas.

Students living in the most deprived areas were more likely to have chocolates ($P=0.01$) and soft drinks ($P<0.001$) available at home and less likely to have fresh fruit and vegetables ($P<0.001$) available at home compared with students living in more affluent areas. This finding is consistent with previous research⁽⁹⁾ and is important since home availability of foods is an important predictor of adolescent eating behaviour⁽¹⁰⁾. It is noteworthy, however, that more than 25% of all students reported that they usually have chocolates or soft drinks available at home.

Table 1 Demographic characteristics of study sample by area-level deprivation

	Low-deprivation areas		Middle-deprivation areas		High-deprivation areas	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Total	3218	36.3	3397	38.3	2250	25.4
Gender						
Male	1650	34.6	1919	40.1	1212	25.2
Female	1565	38.5	1470	36.1	1028	25.3
Age (years)						
≤13	578	32.2	690	38.3	532	29.6
14	728	35.8	783	38.4	532	25.8
15	736	38.0	733	37.8	469	24.2
16	644	38.0	655	38.5	400	23.5
≥17	530	38.4	535	38.8	313	22.8
Ethnicity						
Asian	424	38.6	481	43.8	194	17.6
European	2168	46.4	1926	41.0	594	12.5
Māori	334	20.3	577	34.9	743	44.9
Other	219	42.4	190	36.9	107	20.7
Pacific	70	7.8	221	24.8	601	67.4

Table 2 Relationship between area-level deprivation and eating behaviours, attitudes and environments

	Low-deprivation areas				Middle-deprivation areas				High-deprivation areas				P value*
	n	%	OR	95% CI	n	%	OR	95% CI	n	%	OR	95% CI	
Healthy behaviours													
Always eat breakfast	2071	61.7	1.00	—	1994	56.8	0.76	0.7, 0.8	994	42.0	0.42	0.4, 0.5	<0.001
Always eat lunch	2350	82.0	1.00	—	2327	78.3	0.76	0.6, 0.9	1379	70.1	0.50	0.4, 0.6	0.005
Eat five or more fruit and vegetables a day	653	20.6	1.00	—	717	21.7	1.10	1.0, 1.2	559	26.1	1.30	1.1, 1.6	0.330
Share family meals, ≥ 5 d/week	1935	61.0	1.00	—	1960	59.3	0.91	0.8, 1.0	1167	54.1	0.72	0.6, 0.8	0.180
Less healthy behaviours													
Eat fast food, four or more times a week	255	8.0	1.00	—	337	10.2	1.28	1.1, 1.5	502	23.3	3.45	2.7, 4.4	<0.001
Eat chocolates once a day	427	13.5	1.00	—	475	14.3	1.08	0.9, 1.3	515	24.0	2.03	1.7, 2.4	<0.001
Eat potato chips once a day	363	11.5	1.00	—	438	13.2	1.16	0.9, 1.4	473	22.0	2.14	1.8, 2.6	<0.001
Drink soft drinks once a day	321	10.1	1.00	—	427	13.0	1.30	1.1, 1.5	520	24.4	2.85	2.4, 3.5	<0.001
Attitudes and environment													
Student cares about eating healthy food, very much	1115	35.2	1.00	—	1102	33.6	0.97	0.9, 1.1	712	33.5	0.94	0.8, 1.1	0.980
Fresh fruit and vegetables available at home, usually	3030	95.4	1.00	—	3128	94.2	0.79	0.6, 1.0	1897	87.6	0.34	0.3, 0.4	<0.001
Chocolates and sweets available at home, usually	801	25.3	1.00	—	885	26.7	1.08	1.0, 1.2	656	30.5	1.31	1.1, 1.5	0.010
Fizzy drinks available at home, usually	884	27.9	1.00	—	1068	32.4	1.22	1.1, 1.4	822	38.3	1.61	1.4, 1.8	<0.001
School encourages healthy eating, very much	555	17.5	1.00	—	617	18.8	1.11	0.9, 1.3	567	26.5	1.43	1.2, 1.7	0.024

*Controlling for age, sex and ethnicity.

Approximately one-third of students care about healthy eating very much and there were no differences in students' concerns for healthy eating by area-level deprivation. Moreover, approximately 25% of students living in the most deprived areas reported that their school encouraged healthy eating, compared with 18% of students in less deprived areas ($P = 0.024$). Interventions to address inequalities in nutrition behaviours are not likely to be successful by addressing motivation or school support in more deprived areas. Although it is arguable that the attitudes and perceived school support were generally low, more effective initiatives to address eating behaviours of adolescents may address the social and physical environmental factors influencing food choices.

The strengths of the present study include the large, nationally representative sample of adolescents who participated in the study and the objective and validated measure of socio-economic deprivation used. There are a few limitations to our study that must be considered in interpreting these results. First, while we used an objective measure of socio-economic deprivation, it was an area-based measure. This is important as not all socio-economically disadvantaged people live in deprived areas and vice versa⁽³²⁾. Unfortunately, the Youth'07 survey did not include a robust measure of individual socio-economic position. Second, given the breadth of this survey, in-depth dietary assessment was not possible. This is particularly relevant for our measure of fruit and vegetable consumption, as we were unable to validate our measure against a more robust measure. However, while the estimates of fruit and vegetable consumption may be compromised, we would not hypothesize that the strength and direction of the relationship with deprivation would be biased. Lastly, there may be other factors that explain the relationship between deprivation and eating behaviours. For example, the association between fast-food consumption and socio-economic deprivation may reflect the concentration of fast-food restaurants⁽³³⁾ or marketing promotions for less healthy foods⁽³⁴⁾ in racially segregated areas. This may be particularly relevant in New Zealand as Māori and Pacific populations are over-represented on indicators of deprivation⁽²⁷⁾.

Conclusions

Students from more socio-economically deprived areas perceived more supportive school environments and cared as much about healthy eating as students in more affluent areas. However, these students were significantly more likely to report consuming fast food, soft drinks and chocolates. Addressing socio-economic disparities in healthy eating requires addressing the availability, affordability and marketing of unhealthy snack foods, particularly in economically deprived areas.

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