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Interactions between low-socioeconomic status, adult influences on macronutrient intakes and childhood obesity

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Australia as a developed country has 60% of adults and one in four (25%) children identified as overweight or obese. In 2014–15, 63.4% of Australians adults (aged 18 years and over) were classified as overweight or obese (11.2 million people), with 35.5% overweight (6.3 million people) and 27.9% obese (4.9 million people). The remainder of the population were identified mainly as normal weight (35.0%), with 1.6% of the population as underweight. The prevalence of overweight and obese children aged 5–17 years was 25.3% in 2011–12.[1] Additionally, the Australian Health Survey (2011–12) revealed that in the four-year period starting from 2007–08 there was no statistically significant difference in the proportion of children (aged 5–14) overweight or obese (23% in 2007–08 and 26% in 2011–12).

This study provides an empirical demonstration of the impact that adult influence has on a child's chances of becoming obese through diet habit as well as the prevalence of overweight and obesity among Australian children of low socioeconomic status.

Methods

We analysed data from the Australian National Nutrition and Physical Activity Survey (NNPAS) 2011–12 derived from the larger ABS Australian Health Survey (AHS), a national representative survey data. The survey included 12,153 participants aged 2–85 years and required respondents to calculate their height and weight for measuring Body Mass Index (BMI). BMI was only calculated for 82.8% of respondents aged 2 years and over. This study used binary multiple logistic regression and Spearman's rank correlation coefficient to estimate the odds, probability and association that a child is being influenced by an adult family member.

Results

The results of testing the influence of adult overweight and obesity on the probability of overweight/obese children in the same family are shown in Table 1.

Logistic regression models in Table 1 indicate a positive association of overweight/obesity between adult and child in the same family with standard errors in the parentheses; the numbers reported in the 'margin' column are average predicted probabilities. The estimated odds ratio of 'adult overweight and obesity' is 2.27, which means that the odds of childhood obesity are about 2.27 times higher for each family with an obese adult and are highly significant (p=0.000). The odds of having an obese/overweight child is 57% lower in quintile 5 than that of the most disadvantaged (Quintile 1) household, which is statistically highly significant as P<0.001 (less than one in a thousand chance of being wrong).

The rise in the likelihood of childhood obesity in Australia, which is disproportionately higher among lower socioeconomic groups, suggests that becoming overweight is not likely to be a result of a child's choice alone. Their food intake depends to a great extent on adults' food choices, and these are influenced by socioeconomic status,[2] as well as the availability of food, which may depend on budget constraints.

We used Spearman's correlation coefficients, which showed an association between the average fat and sugar intake of a child and adult member of a household, where all the

Table 1: Binary multiple logistic regression results (odds ratio and margin) of child's overweight and obesity considering all households, dependent variable: 'Is Child Overweight/Obese' (yes/no), (Individual child level, N = 2,020).

	Odds ratio			Margins		
	Point estimate	95% confidence interval		Point estimate	95% confidence interval	
Is Adult Overweight/Obese						
Yes	2.27** (0.26)	1.82	2.84	0.32 (0.01)	0.29	0.34
No	1	1	1	0.17 (0.01)	0.14	0.19
SEIFA						
Lowest 20%	1	1	1	0.32 (0.02)	0.28	0.37
Second quintile	0.86 (0.14)	0.62	1.18	0.29 (0.02)	0.25	0.34
Third quintile	0.69** (0.11)	0.48	0.92	0.25 (0.02)	0.20	0.29
Fourth quintile	0.56** (0.09)	0.39	0.78	0.21 (0.02)	0.17	0.25
Highest 20%	0.57** (0.09)	0.42	0.79	0.22 (0.01)	0.18	0.25
Major cities of Australia	1	1	1	0.27 (0.01)	0.24	0.29
Inner regional Australia	0.83 (0.11)	0.63	1.09	0.23 (0.02)	0.19	0.27
Outer regional and remote	0.81 (0.12)	0.60	1.10	0.23 (0.02)	0.18	0.28
Gender						
Female	1.16 (0.12)	0.94	1.42	0.27 (0.013)	0.24	0.30
Male	1	1	1	0.24 (0.01)	0.22	0.26

Notes:
*** significant at 1%*
Standard errors in parentheses
Socio-Economic Indexes for Areas (SEIFA)

correlation coefficients were highly significant for adult and child fat and sugar intakes. Sugar intake was strongly correlated with fat intake for both adults and children, and the highest correlation for both adult and child consumption was in terms of saturated fat.

Discussion

In Australia, children mainly depend on what their adult carer/s provide for them to eat, and this choice of food influences the children's eating patterns. In addition, parents act as role models and children follow their lead in choosing foods that parents serve most often. Therefore, a lack of dietary education[3] and a diet of high sugar and high fat tend to 'roll over' to the next generation and create an intergenerational cycle. Adults who make unhealthy food choices for their children are contributing to their developing weight status and a significant increase of childhood obesity.

One of the principle aims of Obesity Australia is to optimise the early childhood years (up to the age of four) to minimise the risk of obesity. This period of time is when the child is totally dependent on the parents/carers for food intake. Given the high rates of childcare for this age group, if adult family members fail to provide a healthy eating environment, childcare providers are at least as important – possibly more important – than adult family members in shaping the food preferences of young children. By the time children start school, most of them already have well-developed food preferences, so achieving behaviour change in this age group becomes more difficult; however, not impossible.[4] Therefore, the different kinds of food served in the childcare environment, as well as the attitudes and behaviours of childcare providers, does have an influence on a child's food and eating habits.

Conclusion

The hypothesis that adult food preference leads to child obesity is an important one to assist in tailoring future nutritional interventions. Early childhood is an ideal period for early intervention and prevention, particularly as food preferences and choice of dietary intakes are fundamentally established and strongly influenced in the early years of life. We propose an experimental future study that will also isolate the relative importance of environmental factors of food choice and the impact of school and pre-school in determining childhood obesity in Australia.

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