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Abstract

Purpose: To investigate associations between 'less healthy eating' and 'unhealthy snacking' at age 11, and family life (family structure, meals and maternal employment status) together with potential socio-economic confounders and gender.

Methods: Children participated in a school-based survey, questionnaires also being completed by parents. Analyses were based on those with complete data, weighted to account for bias in return of parental questionnaires (N=2,146). Data from a dietary inventory, questions on food choice and snacks were used classify 'less healthy eating' and 'unhealthy snacking'.

Results: 'Less healthy eating' (57%) and 'unhealthy snacking' (32%) were associated with greater deprivation, fewer maternal qualifications and being male. Compared with children of full-time homemakers, the likelihood of 'less healthy eating' was reduced among those whose mothers worked part-time (this effect remaining after socio-economic adjustment), full-time (effect removed after adjustment), or were unemployed, sick or disabled (effect emerging after adjustment). 'Unhealthy snacking' was not related to maternal employment, and neither measure was associated with family structure or daily meals.

Conclusions: There was no evidence that family structure or meals were associated with children's diets, while maternal employment had a positive association. Contrasting with the size of these effects, relationships between diet and socio-economic status were strong.

Introduction

Commenting on the (May 2004) UK House of Commons Health Committee report on obesity, a prominent politician suggested on a national BBC radio news programme¹ that obesity could be related to family breakdown, including infrequent family meals and working mothers. The implication is that children's family lives impact upon their diets.

Studies in this area find healthier intakes among children and adolescents who consume more meals with their families (Gillman et al., 2000; Haapalahti et al., 2003; Videon & Manning 2003; Neumark-Sztainer et al., 2003a; 2003b). The findings of the few studies which have looked at associations with maternal employment are inconsistent. One suggests that family meals are less frequent when the mother works outside the home (Neumark-Sztainer et al., 2003b). This contrasts with findings that maternal employment is not associated with adolescent meal patterns (Siega-Riz et al., 1998), or with dietary variables (Johnson et al., 1992). There is some evidence of dietary differences according to family structure, again based on very few studies (Moynihan et al., 1993; Johnson-Down et al., 1997; Siega-Riz et al., 1998; Roos et al., 2001).

The aims of this paper are to investigate associations between two dietary measures ('less healthy eating' and 'unhealthy snacking') at age 11 and family life (family structure, family meals and maternal employment) together with potential socio-economic confounders (area deprivation and maternal qualifications) and gender. Given the previous literature, we hypothesise lower rates of 'less healthy eating' and 'unhealthy snacking' among those with two parents and who consume daily family meals. Number of siblings may be associated with a child's nutritional intake (Serra-Majem et al., 2002) as well as with maternal employment. Additional analyses therefore investigate whether number of children in the household is associated with 'less healthy eating', or impacts on associations obtained between 'less healthy eating' and maternal employment.

¹ Lord Tebbit, BBC Radio 4 'Today' programme, 27th May, 2004.

Participants and methods

Data are from *West of Scotland 11 to 16 Study: Teenage Health*, a longitudinal school-based survey of health and health behaviours in a cohort resident in and around Glasgow in the West of Scotland (West & Sweeting 1996). Respondents, recruited during their final primary school year (1994-5, aged 11, N = 2,586, response rate 93%), completed health and lifestyle questionnaires in the school setting (helped by research nurses if necessary). Questionnaires delivered by children to parents were completed and returned to the school (N = 2,237, 86% of the sample).

A 'healthy eating' index was based on a locally developed health-promotion self-completion quiz. Respondents with a fat score (obtained from usual type of milk and frequency of consumption of cheese, chips and processed meats) greater or equal to their fibre score (from usual type of bread and consumption of cereals, fruit and vegetables) were categorised as 'less healthy eaters' (Anderson & Hunt 1992; Sweeting et al., 1994). Respondents were also asked whether they had eaten a variety of snack foods on any of six possible occasions (breakfast, mid-morning, lunch, mid-afternoon, tea and evening) the day before they completed the survey. The number of occasions on which four of these (sweets or chocolate, biscuits or cake, crisps and fizzy drinks) had been consumed were summed to create a scale (mean = 4.1, SD = 2.3). Those scoring 5 or more on the scale were categorised as 'unhealthy snackers'.

Family structure (both birth parents, reconstituted household or lone parent), frequency of family meals, details of children in the household (step-, half-, adopted and foster siblings of the study child), maternal employment status and highest qualifications were obtained via the parental questionnaire. Carstairs area deprivation category was derived from home postcode, included in the children's questionnaire.

Analyses, conducted via logistic regression (thus the results are expressed as odds ratios), were based on those with full data on all variables, weighted to account for bias in return of parental questionnaires (N = 2,146).

Results

Among this sample, 56.8% were classified as 'less healthy eaters' and 32.3% as 'unhealthy snackers'.

'Less healthy eating' was not associated with family structure or daily family meals (Table 1). It was more likely among males, children living in more deprived areas and those whose mothers had non-advanced or no qualifications. However, it was less likely when mothers worked (part- or full-time) compared with full-time homemakers. Much greater variance was explained by deprivation and qualifications than mother's employment status. After adjustment for all other variables, differences remained for part-time work and emerged in respect of having an unemployed or sick/disabled mother, both associated with reduced odds of 'less healthy eating' compared with mothers who were full-time homemakers. When all variables were included in the model, independent effects also remained for both deprivation and qualifications.

In order to investigate whether particular foods were skewing the results (in particular in respect of the relationship obtained in respect of having an unemployed or sick/disabled mother), additional analyses (not shown) investigated the associations that family structure, family meals and maternal employment status had with each component of 'less healthy eating'. Several items (cheese, cereals, fruit, salads, baked beans and potatoes) were not associated with any of these 'family' variables. Other items showed some associations, generally indicating higher fat consumption (chips, processed meats, whole fat milk) among children from 'other' family structures and whose maternal employment was classified as 'homemaker' or 'other/missing/no mother figure'.

Further additional analyses found, unsurprisingly, that maternal employment was associated with number of siblings (e.g. among full-time homemakers, 7% had one, while 26% had four or more children in the household; among mothers who worked full-time, 16% had one, while 5% had four children or more). Although the odds of 'less healthy eating' were higher when there were four or more compared with one child in the household, this difference was not significant. Nor did accounting for number of children alter the findings in respect of maternal employment.

'Unhealthy snacking' was not associated with family structure, family meals or maternal employment status (Table 1). It was more likely among children living in more deprived areas and those whose mothers had no qualifications (although these socio-economic variables explained much less variance in 'unhealthy snacking' than in 'less healthy eating'). 'Unhealthy snacking' was also more likely among males. These effects remained when all variables were included in the model.

Discussion

We acknowledge that our data were collected 10 years ago and as such may be less relevant to current 11 year olds, and that our dietary measures are crude. The 'healthy eating' index omits a number of items now prominent in the diets of many children, such as pizzas and pasta, and has not been validated against actual nutrient intake. However, the index does include food items which continue to contribute significant amounts of fat and fibre-rich carbohydrate to the UK diet, and its associations with socio-economic status and gender are as would be expected. In addition, the measure of 'unhealthy snacks' includes items high in sugar, fat and salt, whose increasing consumption by young people has been highlighted as an issue for concern (Zizza et al., 2001) .

After adjusting for (their much more advantaged) socio-economic status, 11-year olds with mothers who were in full-time work were just as likely to be 'less healthy eaters' as those whose mothers were full-time homemakers. The socio-economic advantage of those with mothers in part-time work was less than that of those with full-time working mothers (but still greater than that of homemakers). Thus, even after adjustment, the likelihood of 'less healthy eating' remained lower for the children of part-time working mothers compared with those of full-time homemakers. It was also lower for those with unemployed, sick or disabled mothers, this effect emerging after adjustment for socio-economic status because of the high levels of disadvantage among this group. This result is difficult to explain, but could possibly relate to compensatory use of time by these mothers. 'Unhealthy snacking' was not related to maternal employment, and neither measure was associated with family structure or, to our surprise, family meals. In this sample of Scottish 11-year olds,

the current analysis therefore revealed no evidence that these aspects of contemporary family life have had an adverse impact on children's diets.

In contrast to the size of the effects associated with family life, relationships between diet and both area level deprivation and lack of maternal qualifications were strong. In addition, the independent effects of these two indicators of socio-economic status suggest the mechanisms through which they operate may differ. These results suggest that we must look beyond the family and towards multi-faceted social and environmental interventions in order to make the greatest impact on children's diets.

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TABLE 1: Odds of ‘less healthy eating’ and ‘unhealthy snacking’ according to family structure, family meals, maternal employment status, area deprivation category, maternal qualifications and gender: (a) unadjusted; (b) after adjusting for all other variables.

	‘less healthy eating’						‘unhealthy snacking’				
	(N)	(a) unadjusted		R ²	(b) adjusted		(a) unadjusted			(b) adjusted	
		OR	(95% CI)		OR	(95% CI)	OR	(95% CI)	R ²	OR	(95% CI)
family structure											
both birth parents	(1581)	1.00		.002	1.00		1.00		.000	1.00	
reconstituted	(167)	1.18	(0.85-1.64)		1.06	(0.76-1.49)	0.98	(0.70-1.38)		1.00	(0.70-1.41)
lone parent	(347)	1.14	(0.90-1.45)		0.96	(0.75-1.24)	1.01	(0.79-1.29)		0.96	(0.74-1.25)
other	(50)	1.55	(0.86-2.80)		1.25	(0.67-2.31)	1.10	(0.61-1.98)		1.01	(0.55-1.86)
family meals											
daily	(1623)	1.00		.000	1.00		1.00		.001	1.00	
less often	(523)	0.98	(0.81-1.20)		1.12	(0.91-1.38)	0.88	(0.71-1.09)		0.94	(0.75-1.17)
maternal employment											
full-time homemaker	(666)	1.00		.011	1.00		1.00		.002	1.00	
part-time work	(700)	0.66	(0.53-0.81)		0.77	(0.62-0.97)	1.02	(0.81-1.28)		1.18	(0.93-1.49)
full-time work	(487)	0.72	(0.57-0.91)		1.00	(0.77-1.30)	0.84	(0.66-1.09)		1.06	(0.81-1.39)
unemployed / sick / disabled	(137)	0.72	(0.50-1.05)		0.66	(0.45-0.96)	0.90	(0.61-1.34)		0.88	(0.59-1.31)
full-time education	(48)	0.59	(0.33-1.06)		0.77	(0.42-1.42)	0.89	(0.47-1.69)		1.14	(0.60-2.19)
other / missing / no m-figure	(107)	0.98	(0.64-1.50)		0.66	(0.40-1.09)	0.82	(0.52-1.28)		0.67	(0.40-1.14)
area deprivation											
least (DEPCATS 1,2,3)	(632)	1.00		.037	1.00		1.00		.011	1.00	
mid (DEPCATS 4,5)	(604)	1.59	(1.27-1.99)		1.44	(1.14-1.82)	1.35	(1.06-1.73)		1.28	(1.00-1.65)
most (DEPCATS 6,7)	(569)	2.26	(1.79-2.85)		1.82	(1.41-2.35)	1.66	(1.30-2.13)		1.47	(1.13-1.92)
missing	(341)	2.25	(1.71-2.96)		1.77	(1.32-2.37)	1.41	(1.06-1.88)		1.18	(0.87-1.60)
maternal qualifications											
none	(967)	1.00		.041	1.00		1.00		.014	1.00	
school / non advanced	(770)	0.65	(0.53-0.78)		0.72	(0.59-0.89)	0.67	(0.55-0.83)		0.68	(0.55-0.85)
post school / advanced	(349)	0.39	(0.30-0.50)		0.46	(0.35-0.61)	0.61	(0.46-0.80)		0.64	(0.48-0.87)
missing	(61)	1.51	(0.84-2.69)		1.88	(0.95-3.70)	0.92	(0.53-1.58)		1.25	(0.66-2.37)
gender											
male	(1104)	1.00		.008	1.00		1.00		.005	1.00	
female	(1042)	0.73	(0.62-0.87)		0.72	(0.60-0.86)	0.77	(0.64-0.92)		0.75	(0.62-0.91)