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SHORT REPORT

Breakfast-skipping in children and young adolescents in The Netherlands

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Background: The objective of this study was to provide national figures on the prevalence of breakfast-skipping and the association with sociodemographic variables in 4–15 year old children. Methods: Data of 4,377 children were collected. A food questionnaire (24 h recall) was completed by the parents or by the older children themselves. Results: Five percent of the children in primary school and 13% of the children in secondary school skipped breakfast before going to school. Breakfast-skipping is more frequent in girls, older children, children of fathers of low education or living with a single parent and in children attending school in a large city. Conclusions: The results of this study point out the need for preventive programmes to encourage breakfast consumption in certain groups at risk.

Key words: breakfast, fasting, nutrition

Insight into breakfast consumption of children and adolescents is of public health concern, for several reasons. Breakfast consumption influences cognition among other things via an increase in blood glucose[1] and missing breakfast has been shown to interfere with cognition and learning, particulary in nutritionally at-risk children.[1–4] However, reviews concerning the short- or long-term benefits of breakfast on cognition and school performance show inconsistent results, which is mainly attributed to design and methodological limitations.[2,3,5]

Moreover, eating breakfast has been shown to be associated with lower plasma cholesterol levels[6] and improved nutritional status of children and adolescents.[3,5,7–9] Skipping breakfast or consuming an inadequate breakfast contributes to dietary inadequacies that are seldom compensated for at other meals. For instance, findings of a study in the US showed that a large percentage of children who skipped breakfast did not meet two-thirds of the recommended dietary allowances for vitamins and minerals.[9] In a randomised clinical trial, eating breakfast proved to be an effective means of reducing fat intake and minimising impulsive snacking.[10]

The aim of the present study was to assess the prevalence of breakfast-skipping on a regular school day among children of different ages in The Netherlands, as well as its sociodemographic correlates.

METHODS

Procedure

As part of the Child Health Monitoring System (CHMS), nutritional habits were assessed in the 1993–1994 school year. In the CHMS, aspects of health of nearly 5,000 children are assessed each year by 20 municipal or regional public health services. The data collection is part of the regular school health assessments by school physicians or nurses. Annually, all participating staff members are instructed on how to collect the data. The population of the CHMS consists of children in groups 2, 4/5 and 7/8 in primary school and in the second year of secondary school (ages approximately 5, 8, 11 and 14 years respectively).

A food questionnaire was mailed, along with an invitation for the routine school health assessment. The questionnaire was completed by the parents of the children in primary school and by the children themselves in secondary school and was handed in during the health assessment. During the health assessment, the school physician or nurse checked the questionnaire for completeness and asked for demographic information.

Measurements

The food questionnaire contained questions concerning the intake of breakfast, brunch, lunch and evening meal on the day before the health assessment (24 h recall). Further questions concerned the consumption of the following food products in the previous 24 h: bread or other cereals, eggs, milk or milk products, potatoes, rice or macaroni and other pasta products, pulses, vegetables, meat or meat products, fish, fresh fruits or fruit juice, soft drinks, sweets and salty snacks. Response options were 'yes' and 'no'; no quantities were asked for.

Sociodemographic variables included gender, age, school type, ethnicity, highest level of parental school education, family situation, employment status of the mother and the community size served by the school. Ethnicity was defined by the nationality of the father and socio-economic status was based on the highest educational level of the father. The school could be located in a rural

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area (villages with less than 20,000 inhabitants), in an urban area (towns with 20,000 inhabitants or more) or in one of the five large cities.

Subjects

Of the 4,433 children invited for the CHMS, 4,204 completed the questions on breakfast consumption (response 95%). Because of organisational problems within two health services, 173 children were not invited for the health assessment, but they completed the food questionnaire at home and returned it by post (overall response 4,377). Children who completed the questionnaire on a Sunday or on another 'special day' (such as the child's birthday or when the child was ill) were excluded (n=1,239), because we were only interested in the consumption of breakfast on regular school days. The sample of the analyses presented in this article therefore contains 3,138 children. Non-response (5%) was higher in children going to school in one of the large cities and in children of fathers with very low education.

Statistical analysis

The analyses were performed with SPSS. To assess differences between breakfast-eating and breakfast-skipping children, relationships in categorical variables between groups (sex, age group etc.) were analysed using χ^2 statistics. Because of the large sample size, p values of <0.01 were considered to be statistically significant. A forward logistic regression analysis was applied to determine independent predictors of breakfast-skipping. These results are presented by means of odds ratios and 95% confidence intervals.

RESULTS

The sample consisted of 31% 4–6 year olds, 19% 7–9 year olds, 22% 10–12 year olds and 28% 13–15 year olds. Fifty-one percent were boys and 88% were of Dutch origin. The sample can be considered representative of children in primary and secondary schools eligible for a routine health assessment by youth health care, in respect of age, sex and school type.

Five percent of the children in primary school and 13% of the children in secondary school reported skipping breakfast within the previous 24 h period. This percentage was highest in children of fathers with very low education (20%) (*table 1*). Employment status of the mother was not related to skipping breakfast. The results of the logistic regression analysis showed that breakfast-skipping was more frequent in girls, older children, children of fathers with very low education, children living with a single parent and in children going to school in an urban area or one of the large cities (*table 2*). After correction for other background characteristics, ethnicity and school type were no longer related to the consumption of breakfast.

More children who did not take breakfast had a brunch (45%) than children who took a breakfast (3%). Lunch, however, was reported less by children who skipped breakfast (91%), compared to children who had breakfast (97%). The same accounts for the consumption of dinner (97 and 99% respectively), a rather small but statistically significant difference.

Children who did not have breakfast on the day before the health assessment more frequently consumed salty snacks (31%) and soft drinks (85%) on this same day than children who did have breakfast (22 and 76% respectively). The consumption of bread, milk, potatoes, vegetables, meat, fruits and sweets was more often reported by children who had breakfast. The other products (eggs, fish, rice or macaroni and pulses) showed no significant differences.

Table 1 The percentage of children who skipped breakfast before attending school, by sociodemographic variables (n=3,138)

	n	%
Sex *		
Boys	1,613	6
Girls	1,525	9
Age (years) **		
4–6	980	4
7–9	591	4
10–12	691	8
13–15	876	13
School type **		
Primary school	2,224	5
Secondary school intermediate year	97	17
Secondary school low level	338	18
Secondary school moderate level	194	10
Secondary school high level	285	8
Ethnicity **		
Dutch	2,769	6
Surinamese/Antillean	96	17
Turkish/Moroccan	120	18
Other	153	14
Educational level of father **		
(No) primary education	243	20
Low	1,320	8
Moderate	736	4
High	605	2
Unknown	234	14
Upbringing situation **		
Two parent	2,894	7
Single parent	225	16
Other	19	5
Working mother		
No	1,560	8
Yes, part-time	669	7
Yes, full-time	820	7
Unknown	89	10
Area **		
Rural	1,501	5
Urban	1,105	7
Large city	532	14

* p<0.01, ** p<0.0001

DISCUSSION

Five percent of the children in primary school and 13% of the children in secondary school reported skipping breakfast within the previous 24 h period. In a comparable study among 843 children in primary school in a southern province in 1983, 4% of the children skipped breakfast on the day of the health assessment.[11] This indicates an increase in breakfast-skipping in the past 10 years. Because the sample of the latter study included more children of parents of low education, which was associated with breakfast-skipping in our study, the actual increase in breakfast-skipping might be even higher. A decline in breakfast consumption by children and adolescents has also been found in the US during the past 25 years.[12]

Comparison with other studies is hindered by differences in the definition of breakfast consumption and the measurement methods used. However, the prevalence of skipping breakfast is similar to that found among Canadian primary school children.[13–15]

Our study indicated that missing breakfast is more common in girls and increases with age. The same pattern was found in studies conducted in France, Norway and the US.[6,12,16–18] In contrast, two provincial studies conducted in Canada found no sex-difference or slightly more boys skipping breakfast and a decrease in breakfast omission with grade.[13,14]

The observed age difference could be blurred because for the younger children the questionnaire was completed by their parents, whereas the older children answered for themselves. Although several studies have reported on the issue of disagreement between responses from children and parent proxies,[19,20] recent research showed that proxy ratings are more accurate when the information sought is concrete and visible and less subjective.[21,22] Skipping breakfast might serve as an example of this.

In our study, breakfast-skipping was more prevalent in children of fathers of low education. This is in line with findings among children and adolescents in the US[18] and the adult Dutch population.[23] In contrast, no relationship was found between breakfast-eating and income level in Canadian children.[13,14]

In conclusion, this study indicates that breakfast-skipping is quite common in children in secondary education, children of fathers of low education, children living with a single parent and children attending school in a large city. Health education programmes are therefore needed to encourage breakfast-eating, targeted at special groups at risk. These programmes should take into account the different reasons for skipping breakfast as, for example, single parents might be too busy to prepare breakfast, while older girls may be dieting in order to lose weight.

Table 2 Adjusted odds ratios (OR) and 95% confidence intervals (CI) for skipping breakfast, by sociodemographic variables

	OR	95% CI
Sex		
Boys	1.00	
Girls	1.73	1.30–2.29
Age (years)		
4–6	1.00	
7–9	0.80	0.48–1.35
10–12	1.68	1.10–2.58
13–17	2.67	1.81–3.93
Educational level of father		
(No) primary education	1.00	
Low	0.44	0.30–0.66
Moderate	0.26	0.16–0.43
High	0.14	0.07–0.26
Unknown	0.47	0.30–0.79
Upbringing situation		
Two parent	1.00	
Single parent	1.98	1.31–2.98
Other	0.48	0.06–3.73
Area		
Rural	1.00	
Urban	1.41	1.10–1.98
Large city	2.70	1.89–3.86

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