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Regular family breakfast was associated with children's overweight and parental education: Results from the ENERGY cross-sectional study

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ABSTRACT

Introduction. This study aims to assess (i) the prevalence of having regular family breakfast, lunch, dinner (i.e. 5–7 days/week together with their family) among 10–12 year olds in Europe, (ii) the association between family meals and child weight status, and (iii) potential differences in having family meals according to country of residence, gender, ethnicity and parental levels of education.

Methods. 7716 children (mean age: 11.5 ± 0.7 years, 52% girls) in eight European countries (Belgium, Greece, Hungary, The Netherlands, Norway, Slovenia, Spain, Switzerland) participated in a cross-sectional school-based survey in 2010. Data on family meals were self-reported by the parents and children's height and weight were objectively measured to determine overweight status. Binary regression analyses assessed the associations of having regular family meals (adjusted for potential confounders) with children's overweight/obesity and to assess potential differences in having family meals according to gender, ethnicity and parental education, in the total sample and for each country respectively.

Results. The prevalence of regular family meals was 35%, 37% and 76% for breakfast, lunch and dinner respectively. Having regular family breakfast, but not lunch or dinner, was inversely associated with overweight (OR = 0.78 (95% CI 0.67–0.91)). Children of higher educated parents were more likely to have regular family breakfast (1.63 (95% CI 1.42–1.86)) and less likely to have regular family lunch (0.72 (95% CI 0.63–0.82)) compared to children of lower educated parents.

Conclusion. This study showed that having regular family breakfast – but not other family meals- was inversely associated with children's weight status.

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1. Introduction

Prevalence of overweight and obesity among children and adolescents across Europe is substantial and has grown over the past decades (Han et al., 2010; Kosti and Panagiotakos, 2006; Wang and Lobstein, 2006). Recent reports show signs of a levelling off in prevalence rates of childhood obesity in some countries, (Olds et al., 2011; Rokholm et al., 2010) but there is little dispute that the levels are still too high, thus representing a significant public health challenge (Brug et al., 2012b; Olds et al., 2011; Wijnhoven et al., 2014). The evidence is strong that once obesity is established, it is difficult to reverse through intervention programs (Oude Luttikhuis et al., 2009), thus tracking into adulthood (Singh et al., 2008). Therefore it is important to promote obesity prevention in early childhood.

Determinants of childhood obesity include dietary intake behaviors, meal patterns and physical activity (Brug et al., 2012b). A relevant

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dietary behaviour among children is eating regular meals (Kremers et al., 2006), i.e. breakfast, lunch, and dinner (Mota et al., 2008). Previously published results from the ENERGY (EuropeaN Energy balance Research to prevent excessive weight Gain among Youth) project reported that children who had breakfast and dinner, and children eating 3 meals (breakfast, lunch and dinner) were less likely to be overweight or obese (Vik et al., 2013). In addition, the context in which these meals are consumed may also play a role; eating meals as a family has been reported to be inversely associated with overweight in children (Hammons and Fiese, 2011; Roos et al., 2014; Taveras et al., 2005; Valdes et al., 2013).

In the present study we refer to family meals as eating breakfast, lunch or dinner together with one or both of the parents/caretakers. Potential underlying mechanisms for the association between family meals and overweight/obesity may be that family meals may be healthier and more varied, resulting in better nutritional health (Hammons and Fiese, 2011), and that family meals may be more supervised, resulting in healthier eating (Videon and Manning, 2003). Frequent family meals may also be an indicator of a health-promoting lifestyle of the whole family. Finally, skipping of meals, e.g. breakfast, which has been associated with overweight among children and adolescents, (Croezen et al., 2009; Szajewska and Ruszczynski, 2010) may be less common if having meals with the family is an established habit (Videon and Manning, 2003). A meta-analysis reported that children and adolescents who shared family meals three or more times per week were more likely to be of normal weight than those who shared fewer than three family meals together (Hammons and Fiese, 2011). However, a recent systematic review found inconsistent and weak evidence of an inverse association between the frequency of family meals and risk of childhood overweight, concluding that further research is needed to establish this possible link (Valdes et al., 2013).

Both the meta-analysis by Hammons (Hammons and Fiese, 2011) and the systematic review by Valdes (Valdes et al., 2013) did not include any European studies. Therefore, the ENERGY dataset provides the opportunity to study the association between family meals and weight status among European children 10–12 year old, during the transition from childhood to adolescence. Also the habit of frequent family meals may vary across countries. Children in some countries, i.e. Switzerland, Hungary and The Netherlands, may come home from school for lunch in the middle of the day, whereas in other countries children eat lunch at school.

The present study aimed to assess (i) the prevalence of eating breakfast, lunch, dinner together with family (family meals) among 10–12 year olds in Europe, (ii) the association between family meals and weight status of these children, and (iii) potential differences in having family meals according to country of residence, gender, ethnicity and parental levels of education.

2. Materials and methods

The ENERGY-project) (Brug et al., 2010) includes a cross-sectional, school-based survey of anthropometrics and energy balance related behaviors across eight European countries. The design and conceptual framework of the project (Brug et al., 2010), as well as the description of the cross-sectional survey (van Stralen et al., 2011), have been previously published. The present study was conducted according to the guidelines in Declaration of Helsinki and all procedures involving human subjects were approved by the relevant ethical committees and ministries in each participating country (van Stralen et al., 2011).

2.1. Sample and procedure

Eight countries were included in the school-based survey (Belgium, Greece, Hungary, The Netherlands, Norway, Slovenia and Spain), conducted between March and July 2010, and Switzerland were included later i.e. the last questionnaires were distributed in December 2010. A national sample frame was used in Greece, Hungary, The Netherlands and Slovenia, while schools from specific regions were sampled in Spain, Belgium, Norway and Switzerland. Pupils in their final years of primary education (aged 10 to 12 years), and one of their parents, were included in the study. Based on previous cross-European studies, we aimed for a sample of 1000 schoolchildren per country and one parent for each child.

A school recruitment letter was sent to the headmaster of the sampled schools, followed by a personal telephone call. Following the school's agreement, parents received a letter explaining the study's purpose and were asked to provide a written consent for their child's participation in countries where active informed consent (opt in) was required (Belgium, Hungary, Norway, Spain, Greece, Slovenia and Switzerland). In The Netherlands where medical ethical approval required passive informed consent (opt out), the parents were provided with study information and a form that they could return to the school to declare that their child was not to be included in the study. The children were provided with an information letter prior to the study and a statement that participation was voluntary. The children completed a questionnaire in the classroom in the presence of a trained project worker (approx. 45 min). Children participating in the study received a questionnaire to take home for completion by one of their parents. Completed parent questionnaires were brought back to the school in a closed envelope by the children and were collected by the teacher. A total of 199 schools participated, with 7716 children (response rate 59%) and 6419 parents (response rate 54%) completing the items of interest in this study's questionnaires. There were mostly mothers (82%) who filled in the parent questionnaire. The 7716 children and the 6419 parents constitute the study sample in the present study.

2.2. Measures

All measures were conducted according to standardized protocols (van Stralen et al., 2011), and questionnaires were translated and back translated to ensure consistency across languages. Further information regarding the procedures and training of research staff are published elsewhere (van Stralen et al., 2011).

2.3. Family meals

Prevalence of family meals was assessed in the parent questionnaire by three questions. “How often do you and/or your spouse/partner have breakfast together with your child?” “How often do you and/or your spouse/partner have lunch together with your child?” How often do you and/or your spouse/partner have dinner together with your child? All of the three questions had response options: “Never”, “Once a week”, “2–4 days a week”, “5–6 days a week” and “every day”. The three family meals items were dichotomized into 5–7 days per week vs. 2–4 days or less per week. Test-retest reliability of the family meals items was 0.79 for “how often do you have breakfast with you child”, 0.80 for “how often do you have lunch with you child” and 0.70 for “how often do you have dinner with you child”, examined in a separate study, expressed by intra-class correlation coefficient (ICC) (Singh et al., 2012). ICCs were calculated for the original scale of the questions that included 5 answering options.

2.4. Weight status

Body height and weight were measured by trained research assistants. The children were measured in light clothing without shoes. Body height was measured with a Seca Leicester Portable stadiometer (accuracy of 0.1 cm), weight with a calibrated electronic scale SECA 861 (accuracy of 0.1 kg). Two readings of each measurement were obtained. If the two readings differed >1%, a third measurement was taken. All three measurements were recorded and the outlier was excluded during the data cleaning process and the mean of the two

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