Prevalence and temporal trends of shared family meals in Germany

Results from EsKiMo II

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Abstract

Family meals can make an important contribution to the development of children and adolescents. EsKiMo II (2015–2017) was conducted about ten years after the first "Eating Study as a KiGGS Module" (EsKiMo I; 2006). This study provides current and representative results regarding family meals in Germany. Overall, the frequency of family meals has increased in the last ten years. Children and adolescents from families with a lower socioeconomic status have family meals significantly less often. Average daily consumption of sugary drinks is significantly lower among adolescents who frequently have breakfast with family members, and daily fruit consumption is significantly higher among children who frequently have breakfast with family members compared to those who seldom do so. The findings of EsKiMo II could help to highlight the importance of family meals and thus promote their positive effects.

Keywords: Family meals, children and adolescents, EsKiMo II, nutrition survey, dietary behavior

Introduction

The benefits of shared meals go far beyond purely physiological and nutritional benefits. As part of family life, they help structure the day and allow parents the opportunity to have meaningful conversations with their children. They provide the opportunity to discuss problems and worries, as well as positive events. This gives children a sense of assurance and helps parents be more involved in their children's lives [1]. Shared meals do not only contribute to psychosocial benefits, they also help develop food preferences and dietary habits. Food preferences are mostly formed at the family table. Brombach called this phenomenon the *'Geschmacksheimat'* (one's 'taste homeland') [2]. Taste is formed within the context of one's cultural environment, for example, eating bread with jam for breakfast, or a roast on Sundays. In addition, memories can play a role in the development of a person's nutritional history, and this role may be positive or negative (e. g. in the case of learned aversions) [2, 3].

Children and adolescents who regularly eat with their families more frequently exhibit health-promoting dietary patterns, such as a higher intake of fruit and vegetables, than those who do not eat family meals on a regular basis [4, 5]. Health benefits that are often discussed in association with family meals include a lower Body Mass Index (BMI) [4, 5] and a lower risk of developing eating disorders [4]. In this context, it does not seem to be significant which meal is eaten together, nor does it matter whether only one parent takes part on it or the entire family [4].

Although family meals come with many benefits, eating together can also represent a challenge. Structural changes within families, such as employment of both parents or

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young people increasingly spending all day in school (a relatively new development in Germany) can make it more difficult to get the family around the table. Additional factors include increasing amounts of time consuming media and busy schedules [6].
A study on family nutrition has indicated that time spent eating together at the weekend has increased [7]. The nationwide, representative nutrition study EsKiMo (Eating Study as a KiGGS Module), which was first conducted in 2006 showed that dinner was the meal most frequently eaten together [8]. However, little is known about how family meal patterns have changed over time in Germany. A study conducted in the USA showed a stable trend in the frequency of family meals in the period 1999–2010 [9]. The recently conducted second survey of the EsKiMo study (EsKiMo II; 2015–2017) shows current family meal patterns of children and adolescents aged 6 to 17 years living in Germany and investigates associations with sociodemographic characteristics, BMI, and dietary behavior. In addition, a comparison with the previous EsKiMo I study (2006) allows changes in family meal patterns over the last ten years to be determined.

Methods

Study population

As part of the nationwide "German Health Interview and Examination Survey for Children and Adolescents" (KiGGS), the Robert Koch Institute (RKI) conducted the first EsKiMo nutrition survey (later called EsKiMo I) in 2006. Ten years after this first survey, EsKiMo II gathered once again representative data on the dietary behavior of children and adolescents. The study population of EsKiMo II is composed of a subsample from KiGGS Wave 2 (2014–2017). Between June 2015 and September 2017, 2,644 children and adolescents aged 6 to 17 years were interviewed about their dietary behavior. Generally, the time gap between participation in KiGGS Wave 2 and EsKiMo II was three to six months.
The dietary assessment for the participants from EsKiMo II was comprised of a Food Frequency Questionnaire (FFQ) from KiGGS Wave 2 and weighted food records over four days for the 6- to 11-year-olds or a computer-assisted diet history interview (Dietary Interview Software for Health Examination Studies, DISHES) for the 12- to 17-year-olds. In addition, for both age groups, a short, standardized interview was conducted to collect further details about dietary behavior (including questions about shared family meals and school catering). The interviews were conducted by trained nutritionists during a home visit. More detailed information on the study design, survey instruments and the EsKiMo II procedure can be found elsewhere [10, 11].

Recording of family meals

Within the short interviews, parents of 6- to 11-year-old children and 12- to 17-year-old adolescents themselves were asked the following: "In your household, are there certain meals that are always eaten together? (not all family members need necessarily be present at once.)". Subsequently, it was asked which meals (breakfast, lunch, afternoon snack, or dinner) and how frequently these were eaten with everyone together. The frequency of shared meals was recorded using the response categories (1) (almost) every day, (2) 3 to 5 times per week, (3) 1 to 2 times per week, (4) rarely and (5) never. The short interview was conducted with 2,641 participants, and 2,638 of these provided details about single meals.

Sociodemographic variables

Further information about sociodemographic variables is available from KiGGS Wave 2 which could be included in the analysis. The socioeconomic status (SES) of each family was calculated based on the information provided by the parents regarding their occupational status, their level of education, and their net household income. Using an index, the families were divided into the categories (1) low SES, (2) medium SES and (3) high SES [12]. In addition, the association between the parents' employment and the frequency of family meals was also investigated. Because 90% of the fathers were employed full-time, only the employment of the mothers was taken into account in the analysis: [(1) Full-time, (2) part-time and (3) not in employment]. For the analysis, the number of household members was categorized as follows: (1) 2 household members, (2) 3–5 household members and (3) > 5 household members. Furthermore, various external conditions were also taken into account, such as the community size [(1) rural < 5,000 inhabitants, (2) small 5,000 < 20,000 inhabitants, (3) medium 20,000 < 100,000 inhabitants, (4) large town ≥ 100,000 inhabitants] and the region (1) former West Germany and (2) former East Germany (including Berlin).

Overweight

Self-reported height and body weight information was collected in the EsKiMo interviews and used to calculate BMI. For this study, overweight was defined based on the age and sex-specific percentiles from Kromeyer-Hauschild. In this system, children and adolescents with a BMI of the 90th percentile or higher are categorized as overweight [13, 14].

Food intake

Consumption of 53 food groups over the last four weeks was obtained using the KiGGS-

	Breakfast		Lunch		Afternoon snack		Dinner	
	%	[95 %-CI]	%	[95 %-CI]	%	[95 %-CI]	%	[95 %-CI]
sex								
boys (n = 1,281)	57.7	[53.8–61.5]	56.6	[52.6–60.6]	18.7	[15.8–21.6]	87.1	[84.1–90.1]
girls (n = 1,357)	53.8	[50.4–57.3]	59.9	[55.7–64.1]	19.9	[17.1–22.7]	87.6	[84.9–90.4]
age								
6–11 years (n = 1,283)	66.8	[63.0–70.6]	56.1	[51.2–60.9]	27.0	[23.6–30.4]	96.4	[94.9–97.9]
12–17 years (n = 1,355)	45.7	[41.9–49.6]	60.2	[56.0–64.3]	12.1	[9.8–14.5]	79.0	[75.6–82.5]
socioeconomic status								
low (n = 257)	40.4	[34.2–46.6]	56.4	[49.9–62.9]	19.1	[13.0–25.1]	80.1	[74.5–85.8]
medium (n = 1,603)	55.4	[52.0–58.8]	59.0	[54.7–63.4]	19.0	[16.5–21.6]	87.9	[85.5–90.4]
high (n = 743)	72.9	[68.5–77.3]	57.2	[51.5–62.9]	19.2	[15.1–23.3]	92.9	[90.4–95.5]
employment of mother								
full-time (n = 589)	52.0	[45.8–58.1]	38.0	[31.3–44.7]	19.2	[14.1–24.3]	86.3	[82.4–90.1]
part-time (n = 1,510)	60.2	[56.5–63.8]	62.8	[58.4–67.3]	18.7	[16.4–21.0]	88.2	[85.6–90.8]
unemployed (n = 463)	48.7	[41.9–55.5]	63.7	[57.6–69.9]	19.2	[14.2–24.2]	87.0	[82.5–91.4]
region of residence								
former West Germany (n = 889)	53.0	[48.4–57.6]	21.4	[17.0–25.9]	25.8	[22.1–29.6]	90.5	[87.1–93.9]
former East Germany (including Berlin) (n = 1,749)	56.4	[53.2–59.7]	65.9	[62.7–69.1]	17.9	[15.3–20.4]	86.7	[84.3–89.1]
community size								
rural (n = 511)	53.3	[48.0–58.7]	57.9	[50.4–65.3]	20.5	[14.3–26.7]	86.2	[82.2–90.2]
small (n = 799)	60.4	[55.3–65.4]	61.6	[54.9–68.2]	18.8	[15.3–22.3]	90.3	[87.0–93.5]
medium (n = 786)	56.7	[51.2–62.1]	63.8	[57.8–69.8]	22.3	[18.0–26.6]	90.0	[86.7–93.4]
large (n = 542)	52.0	[45.7–58.3]	48.9	[41.8–56.1]	15.6	[11.1–20.1]	82.3	[77.1–87.5]
household size								
2 household members (n = 107)	50.4	[36.8–64.0]	28.4	[16.6–40.2]	22.2	[11.0–33.4]	92.3	[87.5–97.1]
3–5 household members (n = 2,232)	57.0	[54.0–60.1]	59.5	[55.7–63.3]	18.9	[16.7–21.1]	88.3	[86.3–90.4]
> 5 household members (n = 227)	50.3	[40.7–59.9]	61.9	[53.3–70.5]	19.8	[12.9–26.7]	79.3	[71.1–87.6]
overweight (> 90th percentile)								
yes (n = 271)	40.4	[32.6–48.3]	51.0	[42.4–59.6]	12.6	[8.3–16.9]	74.8	[67.4–82.1]
no (n = 2,332)	58.2	[55.3–61.2]	59.4	[55.7–63.2]	19.9	[17.6–22.2]	89.1	[87.0–91.2]

Tab. 1: **Prevalence (%) of family meals stratified by sex, age, socioeconomic status, mother's employment, region of residence, community size, household size and overweight**
Due to missing values, the n numbers for the individual analyses may differ.
95%-CI = 95% confidence interval

FFQ [15]. Information was gathered about whether the food in question was consumed, and how often it was consumed in a month, a week, or a day. The amounts were reported based on standard portion sizes (e.g. piece, glass, teaspoon). Photos of portion sizes as well as explanations were provided to make it easier to estimate the amounts. The information about frequency of consumption was converted into the number of occasions per four weeks (28 days). The frequency of consumption was multiplied by the portion amount and then divided by 28 (frequency of consumption x portion amount (g) / 28 days) in order to estimate the average daily consumption (g/day). Subsequently, the following food groups were constructed: fruit, vegetables, sugary drinks (cola, lemonade, ice tea, malt beer, energy drinks, juice), water, confectionery/salty snacks (cakes, cookies, chocolate, chocolate bars, candy, ice cream, chips, salty baked goods/crackers, honey, jam, hazelnut chocolate spread), milk products (milk, cheese, quark, yogurt, sour milk), meat/sausages, fish, fast food (burgers, kebabs, French fries, pizza) and cereal products (muesli, bread, bread rolls, pasta, rice, potatoes).

Statistical analyses

The five response categories for the frequency of shared meals were sorted into either two

Shared breakfast	6 to 11-year-olds					12 to 17-year-olds				
	every day/often		rarely/never			every day/often		rarely/never		
	M	95 %-CI	M	95 %-CI	p-value	M	95 %-CI	M	95 %-CI	p-value
Fruit (g/day)	289	[258–320]	221	[183–258]	0,004	227	[198–255]	246	[207–285]	0,390
Vegetables (g/day)	136	[125–147]	132	[106–158]	0,784	116	[102–130]	128	[103–152]	0,405
Sugary drinks (g/day)	455	[370–541]	653	[416–890]	0,123	592	[482–703]	796	[623–969]	0,047
Water (g/day)	1 213	[1,077–1,349]	1 500	[1,269–1,732]	0,036	1 456	[1,307–1,605]	1 529	[1,367–1,691]	0,514
Confectionery and salty snacks (g/day)	93	[81–105]	92	[74–110]	0,930	106	[87–125]	101	[84–118]	0,720
Milk products (g/day)	329	[292–367]	345	[289–401]	0,661	363	[316–409]	340	[288–392]	0,480
Meat and sausages (g/day)	75	[68–83]	75	[65–86]	0,987	124	[86–161]	105	[94–116]	0,361
Fish (g/day)	13	[9–17]	10	[9–12]	0,190	11	[9–13]	11	[8–13]	0,928
Fast food (g/day)	56	[44–67]	54	[45–62]	0,766	86	[75–97]	87	[75–99]	0,948
Cereal products and side dishes (g/day)	231	[215–247]	242	[220–263]	0,441	287	[261–314]	262	[246–278]	0,110

Tab. 2: **Average food intake in g per day among children and adolescents who have breakfast with family every day/often or rarely/never** (data from the FFQ from KiGGS Wave 2)
FFQ = Food Frequency Questionnaire; M = arithmetic mean; 95%-CI = 95% confidence interval

broader categories: "often" (including "(almost) every day" and "3 to 5 times/week") versus "rarely/never" (including "1 to 2 times/week", "rarely", and "never"), or into three broader categories: "often" (including "(almost) every day" and "3 to 5 times/week") "rarely" (including "1 to 2 times/week" and "rarely"), and "never". Based on this data, prevalences (%) with 95% confidence intervals (95% CI) for family meals were presented stratified by sex, age, SES, mother's employment, region of residence, community size, household size, and overweight. Differences were considered as statistically significant if 95% CI did not overlap. The association between shared family meals and average daily food intake for an entire day was investigated for all meals. For this purpose, average daily intake levels of the described food groups were compared between children and adolescents who ate family meals (1) every day/often and (2) those who rarely/never ate with other members of the household. Differences in the mean intake level were tested using a variance analysis, with p-values lower than 0.05 considered to be statistically significant. A weighting factor was used to account for deviations in the population structure with regard to age, sex, federal state *(Bundesland)* (as of 31 Dec 2015), nationality (as of 31 Dec 2014) and the distribution of education level among the parents (Microcensus 2013 [16]), as well as differences in participation according to seasonality, the socioeconomic status of the family and the type of school the child attends.

Data on family meals for 2,498 children and adolescents aged 6 to 17 years from EsKiMo I were used to determine the changes in prevalences of family meals between 2006 and 2015–2017. The analyses were carried out using a weighting factor and deviations in the sample were corrected to account for the population structure (as of 31 Dec 2004).

All analyses were carried out using the survey procedures of the statistical software SAS Version 9.4 (SAS Institute, Cary, NC, USA), taking the cluster design of the sample into account.

Results

Almost all EsKiMo II participants report that certain meals are eaten together in their household (99.3%), with dinner being the most frequently shared meal. A comparison of the age groups shows that 6 to 11-year-olds eat breakfast, dinner or an afternoon snack together with their families significantly more frequently than adolescents aged 12 to 17 years. No significant differences are found between the sexes with regard to the single meals (♦ Table 1). Family meals are eaten together more often than in EsKiMo I (♦ Figure 1).

Children and adolescents from families with a high SES have breakfast or dinner shared with their families more frequently than those from families with a medium (only breakfast) or low SES. A shared breakfast in particular is much more frequent in young people from families with a high SES with 73% than in families with a medium (55%) and low SES (40%). There are no significant differences with regard to lunch or afternoon snacks (♦ Table 1).

In families where the mother is working part-time, breakfast is the meal most frequently eaten together. In families where the

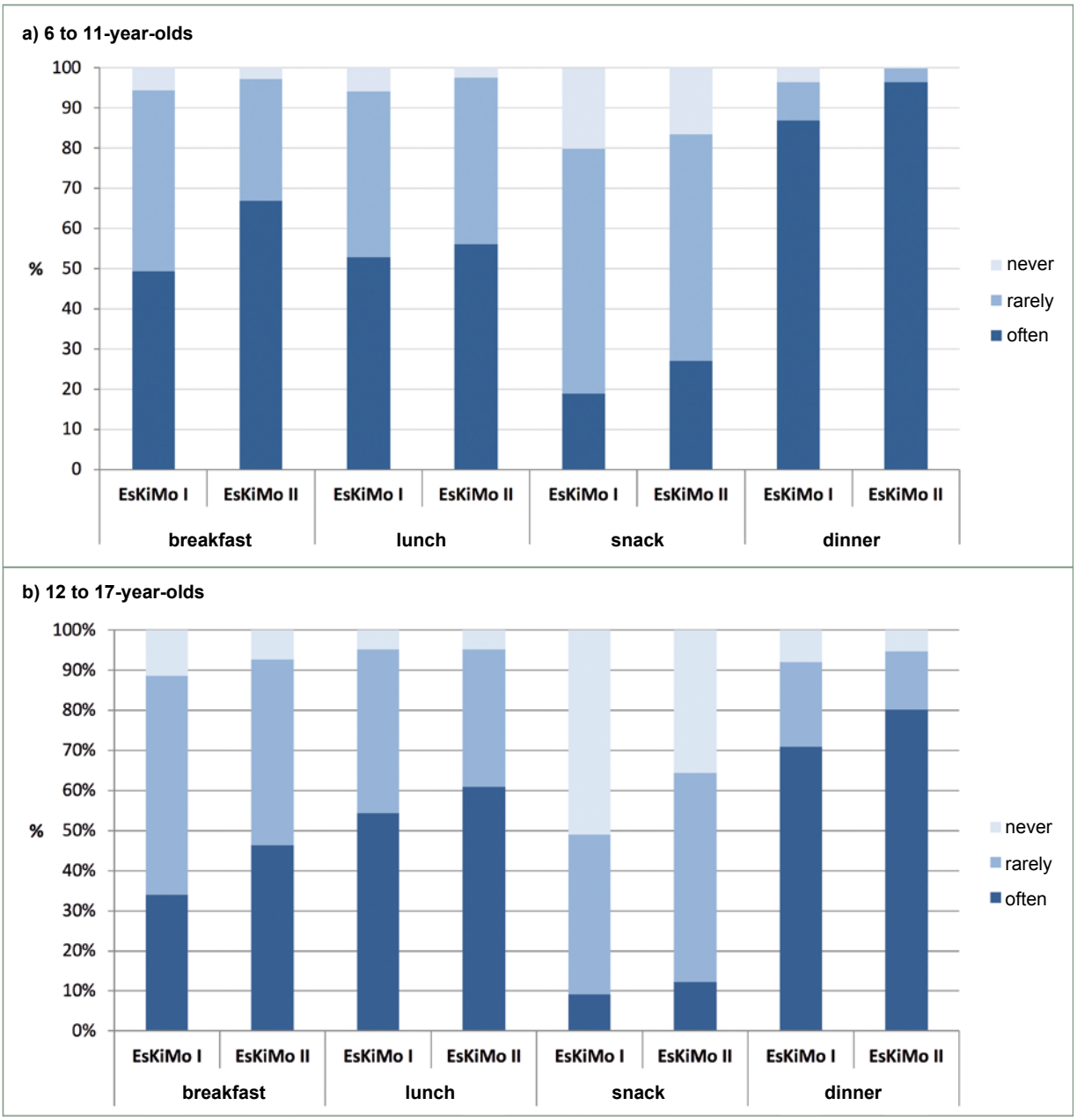

Fig. 1: **Prevalence (%) of shared family meals in EsKiMo II compared to EsKiMo I in (a) 6 to 11-year-olds and (b) 12 to 17-year-olds**

mother is working full-time, lunch is eaten together less frequently than in families where the mother worked part-time or did not work. There are no significant differences with regard to afternoon snacks or dinner (♦ Table 1).

With regard to the region of residence, lunch is eaten together more frequently in former West Germany than in former East Germany (66% vs. 21%). On the other hand, afternoon snacks are eaten together more frequently in former East Germany. Children and adolescents living in large towns have lunch with their families less often than children and adolescents living in areas with medium-sized communities. A shared lunch is eaten significantly more frequently in households with three or more members than in households with two members (♦ Table 1).

Regarding the body weight status of children and adolescents, those with overweight eat breakfast, afternoon snacks, or dinner together with their families less frequently than those without overweight (♦ Table 1).

Taking shared breakfast as an example, the association between shared family meals and average food intake over an entire day is shown in ♦ Table 2. 6 to 11-year-olds who have breakfast with their families every day/

often have a significantly higher fruit intake over the course of the day than children who have breakfast with their families less frequently. Children who have every day/often breakfast with their families drink less water than children who rarely/never have breakfast with their families. With regard to sugary drinks, daily consumption is lower in 12 to 17-year-old adolescents who have breakfast with their families every day/often than in adolescents who rarely/never have breakfast with other members of the household.

Discussion

In recent years, family meals have increasingly been in focus in the scientific community as a possible point of intervention for promoting health and preventing overweight. This is reflected in the fact that publications on the topic have increased almost ninefold since 1970 [5]. The German Federal Centre for Health Education and the *'Gesund ins Leben'* ('Healthy Start') initiative of the German Federal Ministry of Food and Agriculture also provide information about the benefits of family meals and actively recommend them [1, 17]. In this context, EsKiMo II has yielded actual, representative results regarding family meals in Germany. With the exception of lunch, the frequency of shared family meals is higher than it was ten years ago. The fact that lunch is not being shared with the family more frequently is likely due to the expansion of the whole-day school system in Germany [18] and the increasing proportion of students who are having lunch at school [19]. Consequently, family meals are shifting to breakfast or dinner. On working days, the family dinner is often the only opportunity to talk about the daily routine, which means it is highly valued. Shared family meals provide a framework for spending time together and they give family life a structure [7].

Adolescents share meals with their families less frequently than children. Adolescence is a time when self-development and identity formation is taking place. Developing one's own eating style is a part of this. On the one hand, adolescents unbind themselves from their parents' influence and get independent, and on the other hand, the influence of the peer group grows stronger. Eating together with peers of the same age serves more as a manner of expression and as an experience. For financial reasons, the majority of food consumed is still provided by the family, but the intake may not be tied to shared family meals anymore [20]. Shared meals also have the potential to create conflict. Adolescents may refuse to eat shared meals because they are dissatisfied with family relationships. Other obstacles to shared family meals include the parents' working hours, classes in the afternoon, difficulty planning shared activities in advance, and dealing with picky eating habits [5].

However, the absence of shared family meals does not necessarily mean that the meals are not eaten in general. More detailed analyses of the comprehensive DISHES interviews showed that over 60% of the 12 to 17-year-olds stated that they never eat breakfast with their family, but that they do have breakfast at least five days a week. Only 15% of this group stated that they never have breakfast.

Breakfast and dinner were more frequently eaten together in families with a high SES. This is consistent with the results of other studies [5, 9]. The present study cannot answer the questions why families with a lower SES share breakfast and dinner less frequently and why families with a high SES appear to be more able to integrate shared meals into the structure of their daily routine. Conceivable reasons for this would include parents working several part-time jobs, a smaller living space resulting in a lack of space for sharing meals, or a lower amount of flexibility in terms of how leisure time can be spent.

There were also significant differences in intake of shared family meals between different regions. In former West Germany, families had shared meals about three times more often than those in former East Germany. Possible explanations for this could be that in former East Germany, students are more likely to have lunch at school and women more frequently work full-time.

Children and adolescents with overweight have shared family meals significantly less frequently than those without overweight, with the exception of lunch. Two meta-analyses have also shown an association between more frequent family meals and a lower risk of being overweight [4, 5]. However, this could be linked to the association that children and adolescents with overweight tend to belong to families with a lower SES [21]. Analyses stratified by SES showed that children and adolescents with overweight from families with a low SES more often report to have breakfast rarely or never with their families.

Frequent family meals were associated with a lower BMI and with healthier eating habits [4, 5]. EsKiMo II shows that adolescents who frequently share breakfast with their families drink significantly less sugary drinks per day than those who rarely or never have breakfast with their families. Children who often had breakfast with their families had a significantly higher fruit intake and a lower water intake. When SES is taken into account, the difference in water intake diminishes to the extent that it is no longer statistically significant. The difference in fruit intake remains. The literature has also repeatedly often shown that people with a low SES more frequently have a less healthier dietary behavior [22].

Limitations

A limitation for the comparison with other studies is that there is no standard definition for what constitutes a family meal. Studies differ with regard to the definition of a frequent vs. rare family meal. Whereas the present study defined single meals (breakfast etc.) as frequent if they were eaten together three times per week or more, other studies have defined family meals as frequent if they were eaten together more than three times per week [5]. Other differences include definitions about who has to be present for the meal to be considered a family meal (the whole family, at least one parent, most of the family, or at least one other family member). Furthermore, there are other aspects that could not be taken into account, such as the duration, location, or set-up of family meals (e.g. whether media were used during the meal).

Conclusion

The nationwide, representative nutrition study EsKiMo II has shown that the proportion of children and adolescents who regularly eat meals with their families has increased in the last ten years. This development should be interpreted as positive. However, there are specific groups who have family meals less frequently, such as families with a low SES compared to those with a high SES. Public health interventions should increasingly focus on strengthening eating culture and daily family culture, irrespective of social background. This would also be a good starting point for improving the nutritional quality of shared family meals.

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Conflict of Interests
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