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**Title:** Neighborhood Socioeconomic Status and Feeding Practices in Finnish preschools

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**ABSTRACT**

**Aims:** Certain feeding practices, such as role modelling healthy eating and encouragement are recommended to be used in preschools. Little is known about whether preschool characteristics are associated with the use of these feeding practices. Our aim was to examine whether the socioeconomic status (SES) of the preschool neighborhood is associated with the feeding practices in preschools.

**Methods:** This study was part of a cross-sectional DAGIS study. We studied 66 municipal preschools and 378 early childhood educators (ECEs). Preschool neighborhood SES was assessed with map grid data. Feeding practices were assessed by questionnaires and lunchtime observation. Associations between preschool neighborhood SES and feeding practices were tested with logistic regression analyses adjusted for ECEs' educational level and municipal policies on ECEs' lunch prices and birthday foods.

**Results:** The crude model showed that in high-SES neighborhood preschools ECEs were more likely to eat the same lunch as children (OR 2.46, 95% CI 1.42–4.24) and to reward children with other food for eating vegetables (OR 2.48, 95% CI 1.40–4.41). Furthermore, in high-SES preschools it was less likely that birthday foods outside the menu were available on birthdays (OR 0.29, 95% CI 0.12–0.71). In the adjusted model, rewarding with other food remained associated with preschool neighborhood SES (OR 2.13, 95% CI 1.12–4.07).

**Conclusions:** After adjustments preschool neighborhood SES was mostly unassociated with the feeding practices in preschools. Municipal policies may have a significant impact on feeding practices and ultimately on young children's food intake in Finland where most children attend municipal preschools.

**Keywords:** feeding practices, preschool, staff, neighborhood socioeconomic status.

**Word count:** 3644

## BACKGROUND

The majority (80%) of children in countries within the Organisation for Economic Co-operation and Development (OECD) attend early childhood education, here named “preschool” [1]. In Finland 74% of 3- to 5-year-olds attend preschool and over 90% of these children spend more than 25 hours a week in preschool [2]. Many children eat two or three meals/snacks in preschool during weekdays. Consequently, what children eat in preschool can greatly affect their energy balance, nutrient intake and the formation of eating habits. Eating habits formed in childhood often track into adulthood, which makes childhood an important period for later diet [3]. Socioeconomic differences appear early in children’s diets, and in Finland, it has been found that mothers’ low educational level is associated with less healthy diet among 6-year-olds [4]. Thus, preschools could have an important role in diminishing these differences.

Children’s food intake in preschools is not only influenced by what is served, but also how the food is served: earlier studies have shown that children’s food intake is influenced by the practices of early childhood educators (ECEs) during meals (hereafter “feeding practices”) [5-7]. For example, ECEs sitting with the children and eating the same food at lunch have been associated with children’s higher vegetable intake [7]. In Finland, National Nutrition Council has set meal recommendations for early childhood education and care, and these recommendations include many feeding practices [8]. Recommendations, however, are not binding. Both Finnish [8] and U.S. [9] recommendations suggest that ECEs should act as role models for healthy eating, let children serve themselves, and not use food as a reward [8, 9]. Some studies have reported the adoption of recommended feeding practices such as ECEs sitting with children at mealtimes [10, 11], but discouraged practices, such as not letting children serve themselves, appear to be quite common also [7, 10, 12].

In socio-ecological models, it is argued that health behavior is influenced by factors in the immediate surroundings (such as home or childcare) which in turn interact with factors on more distal levels, such as organizational, municipal or societal level factors [13]. Thus, a topic of interest is whether some distal level factors, such as the preschool neighborhood’s socioeconomic status (SES), explain differences in feeding practices between preschools. Although some studies have examined factors affecting the physical activity and feeding practices in childcare [14], to our knowledge, there are few studies on how the SES of the preschool or preschool neighborhood affects preschool feeding practices. In a British study it was found that in preschools in more deprived areas (assessed by crime and unemployment rates, housing prices, income, and educational levels) ECEs were more likely to use some recommended practices during meal times [15]. Two U.S. studies have compared preschools that are part of

supplemental programs giving extra support for low income children (including support for healthy eating) to nonparticipant preschools and concluded that feeding practices are more aligned with the recommendations in preschools with supplemental programs [16, 17].

Finnish legislation obliges preschools to offer children full, nutritive food, but compliance to the legislation varies between municipalities and preschools. In Finland, municipalities are the basic units of local level administration, and they control preschools and many other community services. Therefore, municipalities can influence preschool feeding practices by e.g. setting own guidelines and policies, but preschools also have some liberty in deciding about meal time arrangements and practices. Children attending municipal preschools get a breakfast, warm lunch, and an afternoon snack in preschools, all provided by the municipality. Preschool groups in Finland are multidisciplinary and involve teachers, specialized teachers, nursery nurses, and assistants (here collectively called ECEs) with different educational backgrounds and duties. With different educational backgrounds, also ECEs' nutrition knowledge may vary. Overall, nutrition education for ECEs is minimal.

The objective of this study is to examine whether preschool neighborhood SES is associated with feeding practices in municipal preschool groups in Finland. We hypothesized that in such context, preschools in high SES neighborhoods might have feeding practices more aligned with official recommendations, since ECEs in high-SES neighborhood preschools may be more qualified or have more time and resources to pay attention to children's food intake due to less challenging behavior among children [18].

## **METHODS**

This study is a secondary analysis of a cross-sectional DAGIS study, which was conducted in 2015–2016 in eight municipalities in Southern and Western Finland [19, 20]. Eight out of eleven (73%) invited municipalities agreed to participate in the study. In order to include municipalities with socioeconomically diverse populations, municipalities were invited to the study based on their Gini coefficient, proportion of single parent households and low educated people in the municipality [21]. Also, distance from the research centers was essential. Details of the recruitment of the participants and a flow chart presenting the participation and exclusion rates have been reported previously [20]. The study received a written ethical approval by the University of Helsinki Review Board in the Humanities and Social and Behavioral Sciences, and it conforms to the principles embodied in the Declaration of Helsinki. We invited 153 preschools to participate in the study, of which 86 (56%) gave consent. Invited preschools were randomized from all municipal preschools in the participating municipalities. Written informed consent was received from the parents

of the preschool children. The study was conducted in 66 preschools; 20 preschools did not reach the target number of participating children (a minimum of 30% of families in at least one preschool group should have given a consent to participate in the study). In the 66 preschools, there were 161 preschool groups with mainly 3- to 6-year-old children. Of them, 159 took part in the study. Two groups did not participate because none of the children's parents in those groups gave consent.

Three data sets were used: (i) a map grid SES database on preschool neighborhoods, (ii) questionnaire data from two questionnaires provided by ECEs, and (iii) observation data on lunchtime practices.

### **Neighborhood SES**

We assessed neighborhood SES using a grid database from Statistics Finland [22]. The database contains coordinate-based statistical data calculated on a map grid, including the area population's education, employment, and income. Population data within a one-kilometer radius from the participating preschools were used.

The score for the SES of each neighborhood was calculated using database information on (i) income (median population income in the area logarithmically transformed), (ii) educational level (percentage of over 18 year-olds whose highest educational level was a master's degree or beyond), and (iii) area unemployment rate. We coded the unemployment rate inversely in order to get higher values for lower unemployment rates. For each of the three variables, we derived a standardized z score ( $M=0$ ,  $SD=1$ ). We then calculated the ultimate neighborhood SES score for each preschool neighborhood by taking the mean value of the z scores on income, educational level and unemployment rate. The score was then divided into tertiles representing low, middle, and high neighborhood SES. A variable used in another Finnish study examining health behaviors served as a model [23].

### **Feeding practices**

Feeding practices were examined by direct observation of lunch situations and by using two questionnaires, here named as questionnaires A and B. Questionnaire A was given to all ECEs and B additionally to only one ECE per group who acted as the group's contact person. We used two separate questionnaires, because they served different purposes and it was unnecessary for several ECEs per group to answer the questions on questionnaire B.

Questionnaire A included questions on ECE's educational level and other background factors, feeding practices, and attitudes, opinion's and self-efficacy related to children's health behaviors. Altogether 378 ECEs filled in the questionnaire A, the response rate being 78%. Hereafter, we numbered all used feeding practice variables from the

two questionnaires and the observation continuously. In the analyses we used responses to questions on 1) the ECEs' knowledge of fruit and vegetable intake recommendations for children ("What do you think is the official fruit and vegetable intake recommendation for children, how many portions per day?") (open-ended question), 2) how many times per week the ECE eats the same lunch as children (open-ended question), and 3) how often the ECE rewards children with other food for eating vegetables (with response options "never", "rarely", "sometimes", "often", "always").

Questionnaire B, which was only filled in by one ECE per group, included questions on the group's practices and mealtime arrangements which did not need to be asked from all ECEs. By having only one person to answer these questions we wanted to decrease the ECEs' respondent burden. In the analyses we used responses to a question on 4) how often children participate in practical meal preparations, e.g., setting the table (with response options "never", "1 to 5 times a year", "at least 6 times a year", "at least once a month", "at least once a week", "daily"). We also asked 5) whether there are foods available outside the menu on birthdays (response options "no", "yes, but sugary foods restricted" and "yes, sugary foods not restricted"). In total, 146 (out of 159) contact persons from 64 preschools (data from 2 preschools missing) filled in the questionnaire B (response rate 91%).

Lunchtime feeding practices were observed by a trained researcher/research assistant. The lunchtime observation was based on four selected items from the Environment and Policy Assessment and Observation (EPAO) instrument [23], which is an observation tool to assess food and physical activity environments in preschools. Feeding practices observed during lunchtime and used in the analyses were 6) vegetable/salad serving style (did the children serve themselves or not) and 7) whether ECEs sit with the children at lunch tables. Out of 159 lunchtime situations 133 (84%) were observed. Every group's lunch situation could not be observed due to a limited number of research personnel. Groups that were not observed ( $n=26$ , 16 % of all groups) were the groups that had the least number of children participating in the study in that preschool.

Many of the feeding practices studied are included in the meal recommendations for early childhood education and care [8, 9]. The recommendations state that ECE's should act as role models and eat the same food as the children (feeding practices 2 and 7), and that food should not be used as a reward (feeding practice 3). Children's involvement in meal preparations is encouraged (feeding practice 4) and it is stated that children should be allowed to serve themselves (feeding practice 6). In addition, municipalities can have their own regulations on preschool food, and in

some municipalities, children are forbidden to bring birthday treats to be served to other children at preschool (feeding practice 5).

### **Confounders**

Based on preliminary analyses, three variables were used as confounders: 1) the ECEs' professional education, and 2) municipal policy on ECEs' lunch and 3) municipal policy on birthday treats at preschools. The question on ECEs' professional education had seven answer alternatives 1) "none", 2) "vocational qualification in social and health care [practical nurse]", 3) "bachelor of Social Services", 4) "college-educated social pedagogue/educator", 5) "college-educated kindergarten teacher", 6) "bachelor's degree in education [kindergarten teacher]", and 7) "master's degree in education with specialization in early childhood education"). These were categorized into four classes presented in Table 1: 1) no qualification (1); 2) vocational qualification (2); 3) bachelor of social services/social pedagogue (3 and 4); and 4) kindergarten teacher or more (5,6 and 7).

Information on municipal policies on ECEs' lunch and on children's birthday treats was retrieved from the appropriate municipal administrators by e-mail from each of the eight municipalities that participated in the study. Bringing birthday treats to preschool to serve them to other children is a common habit in Finland, but some municipalities have forbidden it. Municipalities also decide whether all or some ECEs get to eat a "model lunch" with children and thereby get the lunch by paying only the its taxable value (=a very low price), while other ECEs pay the full price, if they wish to eat the preschool food. This way the municipality can encourage one or all ECEs to eat the same lunch as the children. Municipal policies on ECEs' lunches were categorized according to whether or not all ECEs got the lunch with its taxable value. The policy on children's birthday treats was categorized according to whether or not children were allowed to bring and serve birthday treats to other children in the preschool.

### **Statistical methods**

Chi-squared tests were used to test associations between neighborhood SES and municipal policies, and municipal policies and two feeding practices. The associations between neighborhood SES and each feeding practice variable were then analysed with logistic regression models. We used dummy variables for the neighborhood SES tertiles with low neighborhood SES as the reference category. Three logistic regression models were fitted: a first crude model with no adjustments, a second model adjusted for ECEs' educational level, and a third model that was additionally adjusted for municipal policies on ECEs' lunch and on children's birthday treats. When group level feeding practices



were analysed, the mean educational level of the ECEs in that group was used. In logistic regression analyses, the strengths of the associations were expressed by odds ratios (OR) and 95% confidence intervals (CI). In order to take into account the nested design of the sample, confidence intervals were adjusted for clustering at the preschool level [25]. All eligible data were used in each analysis. The N of the data varied because of missing values for some variables. The statistical programs IBM Statistics SPSS 21.0 and *Mplus* Version 7.4 were used.

## RESULTS

Descriptive results are shown in Table 1. In five out of eight municipalities, all ECEs got lunches with taxable fee and in three out of eight municipalities, the children were not allowed to bring birthday treats to the preschool (not presented in tables). Cross tabulations on neighborhood SES and municipal policies on ECEs' lunch prices and children's birthday treats are shown in Table 2. Cross tabulations on the two municipal policies and the prevalence of ECEs eating the same lunch as the children and having birthday foods available in the preschool groups are found in Table 3. The prevalence of staff eating the same lunch as the children and having birthday treats available in the preschool groups varied greatly according to the municipal policy on the topic.

Table 4 presents the associations between neighborhood SES and feeding practices at preschools. The crude model showed that in high SES neighborhood preschools it was more likely that ECEs ate the same lunch as children and used food as a reward (Model 1). When adjusting for the ECE's educational level (Model 2) only the association for rewarding with food remained. The crude model also showed that in high SES neighborhood preschools it was more likely that children served themselves vegetables (borderline significant) and less likely that there were foods outside the menu available on birthdays. After controlling for the ECEs' educational level, only the difference regarding birthday foods remained significant between high SES and low SES groups. When additionally controlling for municipal policies (Model 3), all associations disappeared except for the association between neighborhood SES and rewarding with food.

## DISCUSSION

In this study, we examined whether feeding practices in Finnish public preschools differed by preschool neighborhood SES. In the crude model, it was more likely that ECEs in high SES neighborhood preschools ate the same food as children and rewarded children with other food for eating vegetables. It was also less likely that foods outside the menu were available on birthdays. In the final model, adjusted for ECE's education and municipal policies on ECEs'

lunches and on birthday treats, all the associations except one disappeared, suggesting that these municipal policies explain the examined preschool feeding practices more than neighborhood SES. Only the use of other food as a reward for eating vegetables remained associated with neighborhood SES.

Many studies in recent years have examined feeding practices at preschools [5-7, 10-12, 16, 26, 27]. The majority of these studies originate from the U.S. [7, 10-12, 16, 26, 27] and a few from the Netherlands [5, 6]. In these studies the prevalence of at least one ECE sitting with children varied from 29% to 81% [7, 11, 12, 26] versus 95% in our study, eating (some of) the same food as the children varied from 36% to 66% [5, 7, 12, 16, 26] versus 90% in our study, and letting children serve themselves varied between 8% and 49% [5, 7, 10, 11, 27] versus 30% in our study. In this study, the high rates of sitting with the children and eating the same food as they can be explained by the legislation that obliges one ECE per group to eat a model lunch with the children. In addition, Finnish ECEs consider role modeling healthy eating very important [28].

We have found only one study examining the effects of preschool neighborhood SES on preschool feeding practices [15] and a few examining effects of certain supplemental preschool programs on feeding practices [16, 17]. Contrary to our results, Neelon et al. [15] found that in more deprived areas ECEs were more likely to sit with children during mealtimes and to encourage children to choose foods themselves. Possible reasons for these findings were not discussed. Two previous U.S. studies have found that being part of a supplemental program (e.g. Child and Adult Care Food Program) for healthy eating in preschools might mean that feeding practices at low SES preschools are more aligned with recommendations [16, 17]. In Finland, such programs do not exist, perhaps due to the high standardization of preschool functioning.

In this study, the associations found between neighborhood SES and feeding practices became weaker after controlling for ECEs' education and disappeared altogether after additionally controlling for municipal-level policies. The only exception was rewarding with food, which remained associated with high SES neighborhoods. This was surprising given that the other associations in Models 1 and 2 suggested that in high SES neighborhoods the feeding practices were more aligned with the recommendations. Perhaps ECEs in high SES neighborhoods put more effort in getting the children to eat vegetables, including through the use of this discouraged method. In the Finnish context, ECEs can reward the children only with quite healthy foods (food from the main course, milk, or crisp bread) as there are no sweet/snack foods generally available in preschools.

We also found that municipal policies, preschool neighborhood SES, and feeding practices at preschools were all somewhat associated with each other. As expected, favorable municipal policies were associated with ECEs eating the same lunch as the children and birthday foods not being available. In addition, municipal policies and preschool neighborhood SES were borderline associated with each other. The results indicated that municipalities that included higher SES preschool neighborhoods also had policies that presumably lead to healthier food intake among children. These associations should be further studied with more appropriate samples. With regard to a Norwegian study that found that preschools with bigger food budgets serve more vegetables [29], economic resources and their allocation in the municipality may contribute largely to the food served at municipal preschools and possibly also feeding practices used by the ECEs.

Although income differences in Finland are among the smallest in the E.U. [30], socioeconomic differences in mortality, morbidity, and health behaviors are large in Finland [31, 32]. In addition, socioeconomic differences in food consumption and nutrient intake exist already in early childhood [4]. Thus, recognizing factors that contribute to these differences is important in order to be able to tackle them. Municipal preschools, although equal in theory, can contribute to these differences.

In Finland 87% of children who receive early childhood education, attend municipal preschools or municipal home-based childcare [2]. Thus, associations between neighborhood SES and preschool feeding practices might be stronger or different in countries where differences in income and educational levels between population groups are larger, and where private preschools with policies and practice that are more varied are more common. The existence of different childcare programs for the lowest socioeconomic groups can also influence these associations.

### **Strengths and weaknesses**

The main strength of this study is that it is one of the first studies to examine socioeconomic differences between preschool neighborhoods and preschool feeding practices. Another strength is that some of the group-level practices were directly observed instead of being reported by ECEs, which decreases the possibility of social desirability bias. Although the participation rate among preschools was only moderate, the sample was quite heterogeneous in that it included both urban and rural preschools from different parts of Finland representing different SES neighborhoods and municipalities. In addition, the questionnaire response rate among ECEs was high. The study would have gained from a larger sample size, but as this was a secondary analysis of DAGIS study, power calculations were not done for the purposes of this study. We are aware that neighborhood SES as a proxy for preschool SES has its weaknesses, but

compared to other options (such as using the SES of the DAGIS study participants, with participation rate of 27%) we considered neighborhood SES as more broad and justifiable measure of preschool SES.

In this study, we have examined only a handful of feeding practices among many. The use of other research methods, such as video recordings of meal situations, could add useful knowledge on feeding practices in preschools. For example, interaction between the ECEs and the children would be of interest, but it is challenging to examine with quantitative methods.

## **CONCLUSIONS**

This study is among the first to examine the associations between preschool neighborhood SES and feeding practices in preschools. Associations were found, but most socioeconomic differences disappeared when controlling for municipal policies on feeding practices. It is a positive finding that preschools mostly have equal feeding practices despite neighborhood SES. Further research should examine if similar associations hold in other contexts, and whether preschool feeding practices mediate associations between preschool municipal policies or neighborhood SES, and children's food intake.

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**DECLARATION ON CONFLICT OF INTERESTS**

The authors declare that there is no conflict of interest.

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Table 1. Descriptives of the early childhood educators (ECEs) and feeding practices in the preschool groups in DAGIS study. (SD=standard deviation).

	<b>% or mean (SD)</b>
<b>Questionnaire A (filled in by all ECEs)</b>	<b>N 378</b>
<b>Women</b>	97%
<b>Age, years</b>	42 (11.6)
<b>Educational level</b>	
No qualification	5%
Vocational qualification	51%
Bachelor of social services/social pedagogue	21%
Kindergarten teacher or higher	22%
<b>ECEs' lunch</b>	
Eat the same food as the children every weekday	61%
Eat the same food as the children 1-4 days a week	8%
Do not eat the same food as the children	31%
<b>Knowledge of fruit and vegetable intake recommendation for children</b>	
Know the recommendation (=5 portions or more)	23%
<b>Using other food as a reward for eating vegetables</b>	
Never	43%
Rarely	30%
Sometimes	20%
Often	5%
Always	2%
<b>Questionnaire B (filled in by one ECE per group)</b>	<b>N 146</b>
<b>Number of children in the group</b>	19 (5.0)
<b>Number of ECEs in the group</b>	3.2 (0.7)
<b>Food outside the menu on birthdays</b>	
Not available	39%
Available, but sugary foods restricted	30%
Available, sugary foods not restricted	31%
<b>Children's participation in practical meal preparations, e.g. setting the table</b>	
Never	19%

1-5 times a year	14%
At least 6 times a year	7%
At least once a month	7%
At least once a week	14%
Daily	39%
<b>Observation</b>	<b>N 133</b>
<b>Number of children present at lunch</b>	15.1 (4.8)
<b>Number of ECEs present at lunch</b>	3.1 (1.3)
<b>Number of tables the children sat in during lunch</b>	3.6 (1.4)
<b>Lunch situations where at least one ECE sat in all children's lunch tables</b>	41%
<b>Vegetable/salad serving style*</b>	
Children served themselves	30%
ECEs served	70%

\*Vegetables/salad was served on 122 lunch situations. Lunches without salad/vegetables were soup lunches where usually fruit was served.

Table 2. Preschool neighborhood socioeconomic status and municipal policies on early childhood educators' (ECE) lunch prices and children's birthday treats (chi-squared test).

		<b>Municipal policy on ECEs lunch prices</b>	<b>Municipal policy on children's birthday treats</b>
		All ECEs get lunch with its taxable value	Children are not allowed to bring birthday treats to be shared with other children
<b>Preschool neighborhood SES</b>	Low	50%	18%
	Middle	68%	36%
	High	82%	50%
		X <sup>2</sup> =5.05 Df=2 p= 0.08	X <sup>2</sup> =4.94 Df=2 p= 0.09

Table 3. Municipal policies and early childhood educators' (ECE) lunch and birthday treat practices (chi-squared test).

		<b>ECEs who eat the same lunch as the children</b>
<b>Municipal policy on ECEs' lunch prices</b>	All ECEs get lunch with taxable value	83 %
	Not all ECEs get lunch with taxable value	43 %
		X <sup>2</sup> =63.53 Df=1 P< 0.001
		<b>Birthday foods available</b>
<b>Municipal policy on children's birthday treats</b>	Children are not allowed to bring birthday treats to each other	21 %
	Children are allowed to bring birthday treats to each other	90 %
		X <sup>2</sup> =69.46 Df=1 P<0.001



Table 4. Logistic regression analysis for associations between preschool neighborhood socioeconomic status (SES) and feeding practices. Odds ratios (OR) and 95% confidence intervals (CI).

Dependent variables	Neighborhood SES	OR (95% CI)		
		Model 1	Model 2	Model 3
ECE knows the national recommendation on fruit and	Low	1	1	1
	Middle	0.73 (0.41-1.30)	0.72 (0.38-1.38)	0.75 (0.39-1.44)
	High	0.62 (0.35-1.10)	0.60 (0.33-1.10)	0.60 (0.33-1.10)
ECE eats the same lunch as the children (at least once a week vs. less often)	Low	1	1	1
	Middle	1.58 (0.93-2.69)	1.40 (0.60-3.29)	0.88 (0.41-1.86)
	High	2.46 (1.42-4.24)	2.16 (0.93-5.02)	1.07 (0.44-2.60)
There is at least one ECE sitting in all lunch tables	Low	1	1	1
	Middle	2.18 (0.72-6.54)	2.27 (0.75-6.89)	1.94 (0.59-6.35)
	High	2.01 (0.77-5.24)	1.87 (0.71-4.88)	1.41 (0.55-3.62)
ECE rewards the children with more popular food for eating vegetables (at least sometimes vs. rarely or never)	Low	1	1	1
	Middle	1.79 (0.98-3.26)	1.79 (0.95-3.39)	1.60 (0.83-3.06)
	High	2.48 (1.40-4.41)	2.47 (1.27-4.82)	2.13 (1.12-4.07)
Children self-serve vegetables/salad	Low	1	1	1
	Middle	1.72 (0.61-4.84)	1.75 (0.53-5.83)	1.24 (0.43-3.60)
	High	2.64 (0.98-7.11)	2.42 (0.79-7.38)	1.52 (0.50-4.63)
Foods outside the menu are available on birthdays	Low	1	1	1
	Middle	0.57 (0.23-1.44)	0.63 (0.19-2.03)	1.71 (0.39-7.54)
	High	0.29 (0.12-0.71)	0.31 (0.10-0.95)	0.72 (0.23-2.30)
Children participate in practical meal preparations daily	Low	1	1	1
	Middle	0.95 (0.40-2.22)	1.00 (0.41-2.41)	0.88 (0.34-2.28)
	High	0.87 (0.38-2.02)	0.92 (0.40-2.09)	0.78 (0.30-1.97)

ECE = early childhood educator

Model 1: no adjustments

Model 2: adjusted with ECE's education

Model 3: adjusted with ECE's educational level, municipal policy on ECEs' lunch prices and municipal policy on children's birthday treats.

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