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The Role of Sleep, School Lunch, and Relationships for School Enjoyment

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Objectives: This study examined the relationship between students' school enjoyment, health behaviors and social relationships at school. **Methods:** The sample included 487 children of both sexes, ages nine to 13, from 25 classrooms in Finland and Norway. Data include surveys from children and teachers. A multilevel regression analysis was used. **Results:** The student-level variables of sleep duration and eating school lunch were associated with higher levels of school enjoyment. The student-level and class-level variables of teacher support and peer victimization were associated with school enjoyment. **Conclusions:** Emphasizing the importance of sleeping and dietary habits, improving lunch arrangements and the quality of school lunch, and developing social relationships in schools might promote students' school enjoyment.

Key words: emotional health, nutrition, bullying, school food services

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Children's subjective well-being is partly determined by the experiences gained from the schools they attend¹. School enjoyment contains the both affective satisfaction of school life and cognitive evaluations of the quality of school life. Cross-sectional studies have shown that school enjoyment is positively associated with better health outcomes^{2,3}, mental health^{4,5}^{6,7} and overall life satisfaction and happiness^{2,6,7,8,9,10,11,12,13}. Additionally, a Danish 32-year follow-up study on 11,736 men showed that disliking going to school at the age of 12 was a strong predictor of adult alcohol and drug abuse¹⁴. Hence, better knowledge of the

associations of school enjoyment not only enhances the understanding about the school-age children's well-being but may also help to develop better practices in schools.

Our literature search focused on three close terms—school enjoyment, school satisfaction, and school liking—that are often studied with the questions of similar kinds containing students' perceptions of school life. School enjoyment has been related to demographic factors such as sex and grade indicating that girls and younger students tend to be more satisfied with school than boys and older students^{4 10 13 15 16 17}. Furthermore, earlier research has revealed that caring social interactions, perceived social support particularly from teachers, and feelings of fair treatment and safety at school have substantive correlates with school enjoyment^{3 4 9 13 17 18 19 20 21}. On the contrary, interpersonal conflicts in the classroom and problems with friends can have harmful associations with young people's school enjoyment and health^{3 7 13 22}. In addition to the student-level factors, previous studies have noted the associations of the class- and school-level factors with a student's perception of school life^{3 13 23 24 25 26}. For example, the average school level of teacher-student relationship was associated with school life satisfaction among South Korean adolescents³.

So far, most studies in school enjoyment have concentrated on the social factors and rather less attention has been paid to students' health behaviors. However, we argue that health behaviors correlate with students' perceptions of school life because the school day is too long for children to stay content without proper food and sufficient sleep last night. The HBSC-study showed that students with negative school experiences have more multiple recurrent health complaints, including sleeping difficulties, than students with positive school experiences². Both self-reported sleep and weight status have been associated with better academic performance among fifth-grade students in US²⁷. Furthermore, shorter sleep durations have correlations with obesity in children and adolescents, and with depression, poorer attendance rates, and school violence-related behaviors among adolescents^{28 29 30 31 32}.

Moreover, the interrelation between inadequate nutrition and academic achievement has been shown in previous research³³.

The purpose of the present study was to explore a research question: *To what extent do sleep duration, breakfast and school lunch correlate with students' school enjoyment beyond that afforded by differences in the variety of background and social factors?* To answer the research question, we used the data from Finland and Norway, which are Nordic welfare states with a long history of publicly organized education for all children and free comprehensive school tuition³⁴. However, cultural differences were not the issue in this study. Instead, the issue was the associations with school enjoyment in general, for which purpose the international data provide a more compelling basis.

METHODS

Participants

The current study was based on the data collected during the 'Barndom og Skole i Velferdsstaten' (Childhood and School in a Welfare State) project (2009–2012 Norges Forskningsråd and NTNU, Leiulfstrud), which centred on two elementary schools in the city of Tampere, Finland, and two elementary schools in the city of Trondheim, Norway. The schools were selected in line with a quasi-experimental design, with the aim of achieving an even socio-economic sampling, choosing one school in a high-status area and the other in a low-status areas in the two cities. The cities' districts were selected by replicating the procedure in a similar survey in 2003 involving, for example, the unemployment rates of the adult population as the selection criteria³⁵.

The respondents, ages nine to 13 years, were drawn from 15 Finnish and 10 Norwegian classes. In Finland, the participants were from grades three to six and in Norway from grades four to seven, the reason for the difference being that Norwegian children start school at the age of six, whereas Finnish children start at age seven. A total of 503 respondents returned a

school-related questionnaire (the response rates were 87% in Finland, and 74% in Norway). The present multilevel study consists of 487 students (260 Finnish and 227 Norwegian) due to missing values identifying sex and immigrant family background.

As shown in Table 1, approximately the same proportion of Finnish and Norwegian subjects were girls (47.7% and 47.6%, respectively). Adopting the Finnish grade system, relatively more fifth- to sixth-graders than third- to fourth-graders participated in Finland than in Norway, but the difference was not statistically significant. The Norwegian sample includes relatively more students from the school in the high-status area (57.3%) than the Finnish sample (50.8%), but the difference is not statistically significant. A total of 23 Finnish (8.8%) and 23 (10.1%) Norwegian respondents had at least one immigrant parent, and they all studied in the low-status area schools in both countries, apart from one student in Finland and two students in Norway, who were from the high-status area schools.

Instruments

All of our measures were tested before on a previous study that took place in the 2002³⁵
³⁶. School enjoyment was comprised of three items on tripartite scales: 'How much do you enjoy being at school/during breaks/in lessons' (not very much, quite a lot, very much). The first item is similar to one item on Satisfaction at School Scale ('I enjoy being at school')³⁷ but other items have been developed in the present study. This kind of operationalisation for school enjoyment has not been carried out before; however, we had a reason for using separate item concerning breaks. The subjects in this study are between nine and 13 years old and still play games. For these elementary school students, breaks are often the most awaited periods during the school day. Therefore, we wanted to avoid the possibility of students only assessing their experiences in lessons as we wanted assessment of the breaks as well. The results of the exploratory factor analysis using SPSS 23 demonstrated that the highest factor loading was on 'Enjoyment at school' (.966) and the lowest factor loading was on

‘Enjoyment during breaks’ (.482). The explained variance of the factor was 63.925% (Eigenvalue 1.918; principal axis factoring with Oblimin rotation). The reliability analysis indicated moderate psychometric support for the internal consistency of the composition variable of school enjoyment ($\alpha = .717$). For further multilevel regression analysis, the scale of the composition variable was encoded from 1 (low enjoyment) to 6 (high enjoyment) by integrating the two lowest categories to improve normality and diminish outliers because the number of observations was only 4 in the original lowest category [$M = 3.941$ ($SD = 1.344$), Skewness = .068 ($SD = .111$), Kurtosis = $-.692$ ($SD = .221$)].

Sleep duration was assessed by students by the question ‘How many hours did you sleep last night?’. Students’ answers were rounded to the nearest integer (the scale from 1 to 14; $M = 9.077$, $SD = 1.380$). Although self-reported sleep hours have still been used scarcely for elementary school-aged children, the association of self-reported sleep, weight status, and academic performance has been studied in fifth-grade students²⁷. Moreover, a meta-analysis showed a strong correlation between questionnaires and accelerometers for weeknights and a moderate correlation for weekend nights in children and adolescents including one study where respondents were ages nine to 12^{38 39}.

The nutrition items were based on each student’s report on a two-option questions ‘Did you eat breakfast/school lunch yesterday?’ (yes/no) which are simplified measures from the School Health Promotion study⁴⁰. No was coded as 0, yes as 1 (see Table 2 for further information). Breakfast is not available in elementary schools in Finland and Norway. However, cultural differences exist as to how the school lunch is organized in the two countries. Every Finnish student is entitled to a free school meal, a benefit that has been in place since 1943⁴¹. In Norway, on the other hand, children bring lunch packages from home⁴².

Additionally, students gave their assessments of teacher social support and peer victimisation. Teacher support was measured with three questions on tri-point scales 'Does the teacher understand when schoolwork is difficult?' (often/sometimes/never), 'Does the teacher understand when a pupil is feeling bad?' (often/sometimes/never), and 'How important is the teacher at school?' (very important/quite important/unimportant or inappropriate)³⁶. The scale ranged from 1 to 7. The internal reliability of the teacher social support was $\alpha = .618$. Peer victimisation is a composite variable of two items: 'Do other pupils in your class bully you?' (never/sometimes/often) and 'Other pupils do not bully me/bully me sometimes/bully me almost every day'³⁶. The scale ranged from 1 to 5, with 5 indicating continual peer victimization. The internal reliability of the peer victimisation was $\alpha = .750$.

Student's academic competence was added to the analysis as a potentially confounding variable as the previous studies suggested the connection between academic competence and school enjoyment^{9 13 20 37}. Teachers were asked to indicate their numeric evaluation concerning each student's competence in core subjects on 5-point scales (1 = very poor, 5 = very good; see Table 2 for further information)³⁶.

On the grounds of previous studies, potentially confounding variables included information on country, grade, sex, immigrant family status, and self-rated family affluence^{2 5 7 13}. Background measures were all dichotomous variables encoded as 0 and 1. Because the data consisted of only four grades, we merged third- and fourth-graders as the younger students' group and fifth- and sixth-graders as the older group for the purposes of further analysis. The students' sex and immigrant family background were reported by the teachers in order to shorten a student questionnaire. An immigrant family refers to either one or both parents being an immigrant. Self-rated family affluence was assessed by the children and addressed with the question, 'Does your family have the money to buy or do things when you

want? (There is always plenty of money/a fair amount of money/always too little money at home/I can't say/I don't know). The first option indicates plenty of money in the family, while the other options were the reference group³⁶. This kind of self-rated family affluence has been little used among children so far. However, the self-rated measure of the problems with money has been analyzed previously⁷. (See Table 2 for further information.)

The class-level variables in this study were all aggregates of the individual scores. The class-level variables of sleep duration, breakfast, school lunch, teacher support, peer victimization, and competence in core subjects were examined taking the mean of the individual scores within each class. After excluding no significant class-level variables in the analysis, the final model (Model 3) included the average level of the teacher support and peer victimization in class.

Procedure

The survey was carried out during the spring semester in 2009, after obtaining the consent of the schools. Information letters were sent to all students in grades three to six in the Finnish schools and grades four to seven in Norway, due to the different school starting ages in the two countries. The subjects obtained written consent from their parents, and they were given the opportunity to opt out when the researcher presented the questions orally in class during a normal school day. The questionnaires were in the native languages of the respective countries. In addition, the teachers completed a survey including questions about students, with one form for each student. Both the children's and the teachers' questionnaires were returned anonymously.

Data Analysis

There were no missing values in the background variables, apart from sex and immigrant family, cases of which ($N = 10$) were excluded from the multilevel analysis. The missing data percentages for items in the composition variables of school enjoyment, teacher

support, and peer victimisation were .3%, 1.6% and .4%, respectively. The percentages of missing data for hours slept yesterday breakfast, school lunch, and competence in core subjects were 2.7%, .2%, 1.0%, and .4%, respectively. The occasional missing values in the data were substituted by the grand mean of the item for the composition variables and by the grand mean for the other variables.

The preliminary analyses of the current data showed no statistically significant difference between countries at the levels of school enjoyment ($t(485) = -1.253, p = .211$), which made composite data appropriate for analysis. The composite data consisted of students nested within 25 classes, which indicated a possible need to use a multilevel statistical model. To confirm this, the intra-class correlation (ICC) and the design effect statistics were calculated first. The results indicated that 7.547 percent of the variation in school enjoyment occurs across classes and the design effect estimate was 2.820, confirming that there is a variation in the mean school enjoyment levels across classes and that multilevel analysis is necessary to avoid Type-1 error^{43 44}. This fraction is comparable with Verkuyten and Thijs's¹³ study where 7.1 percent of the variance of school satisfaction was located at the class and school levels and with Randolph and colleagues²⁵ study where 6.5 percent of variance of school satisfaction was located at the classroom level.

A linear multilevel analysis was carried out using SPSS 23 for the Finnish and Norwegian data en bloc because the number of classes would have been too small for separate multilevel analyses by country. Firstly, we conducted a two-level model of students nested in classes without any predictors to examine the between-class variance in school enjoyment (Model 1). Secondly, we included the student-level predictors in the analysis (Model 2). Lastly, class-level predictors were added in the analysis while adjusting for student-level predictors (Model 3).

The predictor variables were centered in accordance with the normal practice in multilevel analysis, and different forms of centering were required for level 1 and level 2 predictors as generally recommended^{44 45}. As Model 2 only involves the fixed effects of the student-level predictors on student-level school enjoyment, the continuous and ordinal student-level predictors were centered within clusters (CWC) to avoid an uninterpretable blend of within- and between-class variation in the coefficients present with the grand mean centered (CGM) predictors of the individual level^{43 45}. No centering was applied in the variables of country, grade, sex, immigrant family, and self-rated family affluence, which were all dummy coded. Further, the primary substantive interest in the Model 3 involves the influence of class-level predictors on student-level school enjoyment while controlling for student-level predictors. As is appropriate for level 2 research questions of this kind, we centered the class-level predictors with the grand mean^{44 45}.

RESULTS

The linear multilevel model was conducted to ascertain if sleep duration, and eating breakfast and school lunch are associated with students' school enjoyment, while adjusting for student demographic characteristics, school competence, and individual-level and class-level variables of teacher support and peer victimization. As shown in Table 3, sleep duration and eating school lunch were associated with higher levels of school enjoyment ($p < .05$, $p < .01$, respectively) according to the results in the final model (Model 3). Conversely, eating breakfast did not indicate any association with school enjoyment. Additionally, both individual-level and class-level variables of teacher support ($p < .001$, $p < .01$, respectively) and peer victimization ($p < .001$, $p < .05$, respectively) predicted school enjoyment. Conversely, teacher's estimate of student's competence in core subjects did not indicate any association with student's school enjoyment. The significant background variables were sex and self-rated family affluence ($p < .05$, $p < .001$, respectively) indicating that girls and

students whose family had plenty of money had higher levels of school enjoyment. Student's grade (third- and fourth-graders) predicted the higher levels of school enjoyment when individual-level predictors were analyzed (Model 2; $p < .001$) but not after controlling with the class-level predictors.

The index of determination was 34.5 percent (the pseudo R) of the Model 3 with the fixed effects of the student- and class-level predictors and background variables. However, this index may be too high given that the third MLM-equation also involved predictors without significant effects on the outcome, but which still increased the index. For this reason, the proportional reduction in variance was also calculated. The result indicates that the student-level predictors explained 26.6 percent of the student-level variance in individual school enjoyment. The class-level predictors included in the model explained 98.7 percent of the class-level variance in individual school enjoyment, based on the proportional reduction in class-level variance. That is, the context variance of individual student's school enjoyment was explained almost completely by the average levels of teacher support and bullying in class. The index of determination was 31.7 percent according to the proportional reduction in student- and class-level variances.

DISCUSSION

This study aimed to add to the growing literature base linking healthy sleeping and nutrition habits with school well-being. The results showed that sleep duration and eating school lunch were associated with student's school enjoyment in the elementary school. Although we found no earlier academic studies concerning the correlations of the sleeping and nutrition habits with school enjoyment, our findings are in the line with previous studies concerning the associations between sleeping and nutrition habits and students' mental health, tiredness, stress, attendance rates and academic performance^{27 29 30 31 46}. Further, in many national inquiries a feeling of being full after eating school lunch has been associated

with the better school enjoyment among Finnish elementary school children⁴⁷. In Finland, every student has been entitled to a free school meal in elementary school, however, our study showed that students do not necessarily utilize this advantage. A total of 5.4 percent of the Finnish students and 5.3 percent of the Norwegian students told that they did not eat the lunch at school yesterday. One reason for not to eat the lunch could be bullying, such as whispering and sniping at victims during the meal, which has been revealed in the qualitative interviews in Finland⁴⁸. On the other hand, in Norway children bring lunch packages from home and sometimes a student had no lunch with him/her⁴². Moreover, lack of appetite could be one reason not to eat the school lunch. A Finnish study showed that low levels of school satisfaction had correlates with the lack of appetite among boys⁷.

In our study no statistically significant association between breakfast and school enjoyment was found which was contrary to expectations. We suspected that perhaps one reason for the negative result was that we controlled for the social factors concurrently. However, when we eliminated the social measures in the analysis, the results were unchanged and breakfast had no association with school enjoyment. The lack of the variability in the measure of breakfast may be one reason for the negative result. However, eating school lunch was measured with the dicotomic measure as well but was still significant. Further studies should further investigate the connection between breakfast and school enjoyment, as previous research has indicated that breakfast frequency was associated with academic performance²⁷.

Teacher support have a strong association with a student's school enjoyment, as the present study demonstrated, thus confirming several previous findings^{3 4 9 13 17 18 19 21}. Additionally, the inverse connection between bullying and school enjoyment was proven in this study as in studies before^{3 13}. Further, teacher support and peer victimization showed significant associations with individual school enjoyment not only within classes but between

classes too. This implies that the more support teacher gives to the entire class, the more satisfied all students in the class could be, irrespective of the students' own experiences about teacher support which is in line with the earlier findings^{3 24}. Moreover, our results indicated that the average level of the bullying in the class has an association with all students' school enjoyment in the class, not only the victim's. This finding is comparable with the earlier study which presented that the lower overall degree of peer acceptance in the school class had association with higher health complaint scores among Swedish girls²². What is remarkable is that Modin and Östberg⁴⁹ found that help from the teacher when needed and harassment in class have associations with psychosomatic health. This implies that the same factors in the classroom are important for both students' school enjoyment and psychosomatic health.

Besides the inspection of health behaviors and social relationships at school, the present study controlled for students' academic competence and demographic characteristics as potentially confounding factors. The academic competence did not have association with school enjoyment which was contrary to the expectations based on some previous studies^{9 13 20 37}. However, the contradictory findings in the research literature may suggest that the association between academic performance and school enjoyment is more complicated^{13 18 37}. Girls showed the higher level of school enjoyment than boys in this study as expected on the previous studies^{4 13 15 16}. Moreover, self-rated family affluence was associated with school enjoyment which is in line with previous finding that problems with money negatively correlated with school satisfaction among Finnish adolescents⁷. However, as the measure of family affluence was reported by children, more research is needed using objective measures in order to make definite conclusions about the issue. Further, we found no evidence about the relationship between immigrant background and school enjoyment. In some studies ethnic or immigrant background has been associated negatively with school satisfaction but other studies found no differences by race suggesting that relationship is more equivocal and, for

example, depends on cultural context and the degree of discrimination experiences by children and their cultural integration^{4 50 51}.

Limitations

This study has several limitations that should be taken into account. The results of the study were not based on a nationally representative sample, but rather on a small sample including children from only four elementary schools in Finland and Norway. However, the quasi-experimental research design guaranteed a socio-economic selection of schools. The response rates were also high in the present study, although the results were mostly limited to self-reported information from students including the sleep duration. In addition, the conclusions about causalities between predictors and school enjoyment are conditional due to the cross-sectional research design. In the future, longitudinal studies of school enjoyment would be needed. Further, indicators of sleeping and dietary habits on the longer period could give more information in the issue.

Conclusions

We found that health behaviors are connected with students' school enjoyment in elementary school even when controlling for the numerous background factors and social environment. The findings emphasize the importance of sleep duration and eating school lunch for school-aged children.

IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY

This study holds an implication that it is important to pay attention to lunch arrangements and the quality of school lunch. As previous research has shown that actual consumption at school-provided meals is positively related with BMI, the education of healthier nutrition in schools is needed⁵². Another implication of the study is to emphasize the importance of sufficient sleep for school-aged children in the education and inform their

parents in the issue. Further, the findings stress the relevance of the teacher's professional competence and preventing bullying in schools.

Human Subjects Approval Statement

The study will comply with the regulations of the Finnish Advisory Board of Research Integrity. All subjects will be informed about the aims of the study, and separate consent was submitted for the parents of the subjects. As this was originally a social scientific study further statement from the ethical review board was not demanded in 2009. The need to get research committee statement involves only medical research in Finland⁵³. In addition, our research was conducted along the guidelines of the national working group on research ethics in the humanities and social sciences (HYMY II). They have suggested that as well that ethical review board statements are not obligatory on studies concerning children. Rather their need highly depends on the nature of study. Our study did not harm the subjects in any way and it does not include sensitive information, and the research itself will not be intrusive by any means. All the responses were anonymous.

Conflict of Interest Disclosure Statement

Authors report no conflict of interest.

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Table 1. Characteristics of the Sample

Characteristics	Finland				Norway			
	<i>n</i>	%	<i>M</i>	<i>SD</i>	<i>n</i>	%	<i>M</i>	<i>SD</i>
Student-level	260				227			
Schools								
Low status area	128	49.2			97	42.7		
High status area	132	50.8			130	57.3		
Grade ^a								
3rd–4 th graders	113	43.5			112	49.3		
5th–6 th graders	147	56.5			115	50.7		
Sex								
Boys	136	52.3			119	52.4		
Girls	124	47.7			108	47.6		
Family background								
Native	237	91.2			204	89.9		
Immigrant	23	8.8			23	10.1		
Class-level								
Classes	15				10			
Respondents/class	6–28		17.3	7.22	16–28		22.7	4.08

Note: ^a adopting the Finnish grade system.

Table 2. Descriptive Statistics of the Dependent and Independent Variables (N = 487)

Continuous variables		<i>M</i>	<i>SD</i>	<i>Range</i>
School enjoyment		3.941	1.344	1–6
Hours slept yesterday		9.077	1.380	1–14
Teacher's support		4.691	1.503	1–7
Peer victimization		1.813	1.022	1–5
Competence in core subjects		3.800	.993	1–5
Dummy variables			%	<i>Range</i>
<i>Nutrition</i>				
Breakfast	no ^a / yes		5.3/94.7	0/1
School lunch	no ^a / yes		10.3/88.7	0/1
<i>Background</i>				
Country	Finland ^a / Norway		53.4/46.6	0/1
Grade ^b	3rd–4 th graders ^a / 5th–6 th graders		46.2/53.8	0/1
Sex	boy ^a / girl		52.4/47.6	0/1
Immigrant family	native parents ^a / no native parents		90.6/9.4	0/1
Self-rated family affluence	less money ^a / plenty of money		54.8/45.2	0/1

Note: ^a reference group, ^b adopting the Finnish grade system.

For continuous scales higher scores are indicative of higher levels of the construct.

1 **Table 3.** Linear Multilevel Models for School Enjoyment: Fixed-Effect Estimates and
 2 Variance Components (student N = 487, class N = 25)

Parameter	Model 1		Model 2		Model 3	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	3.920***	.096	3.252***	.326	3.270***	0.308
Student level						
<i>Background variables</i>						
Country			.051	.156	-.088	.118
Grade			-.479**	.158	-.218	.130
Sex			.223*	.107	.226*	.106
Immigrant family			.263	.193	.196	.185
Self-rated family affluence			.349**	.109	.394***	.107
<i>Sleep and Nutrition</i>						
Sleep hours			.079	.041	.082*	.041
Breakfast			.086	.241	.031	.238
School lunch			.606**	.182	.561**	.180
<i>Social relationships at school and school competence</i>						
Teacher support			.328***	.039	.328***	.039
Peer victimization			-.289***	.055	-.289***	.055
Competence in core subjects			.020	.057	.018	.057
Class level						
Mean of teacher support in class					.353**	.102
Mean of peer victimization in class					-.495*	.233
Variance estimates						
Student	1.672***	.110	1.227***	.083	1.226***	.083
Class	.136*	.065	.078*	.045	.001	.020
Index of fit						
Akaike's Information Criterion	1661.342		1462.595		1448.009	
Number of estimated parameters	3		14		16	

3 Note: *p* values for the residual variance components were halved.

4 * *p* < .05; ** *p* < .01; *** *p* < .001