

# Changes in Lifestyle Habits, Psychosomatic Complaints, and Self-Esteem among Elementary School Students in X prefecture

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**Aim:** To investigate how changes occur in students' health, self-esteem, and lifestyle habits according to grade progression.

**Method:** A self-administered questionnaire survey of fourth- to sixth-grade students from Prefecture X was conducted in December in 2010 and 2011. The survey included questions on the following: basic attributes, lifestyle habits (eating and sleeping habits), the psychosomatic complaints scale (hereinafter referred to as "PCs scale"), and the Self-Esteem Inventory (hereinafter referred to as "SEI").

**Results:** Data of 304 students for which the data matching between the 2010 and 2011 surveys was possible, were used for the analysis. The changes were examined between gender or grade, according to grade progression. Comparison of the 2010 and 2011 results showed that the prevalence of female students who ate breakfast daily significantly decreased from 87 fifth-grade students (94.6%) to 82 sixth-grade students (89.1%). The bedtime of male students changed significantly from 21:58 in the fifth grade to 22:28 in the sixth grade. This trend was also noted with female students whose bedtime changed from 21:55 in the fifth grade to 22:25 in the sixth grade. The length of sleep for female students shortened significantly from 8 h 28 min in the fifth grade to 7 h 57 min in the sixth grade.

The PCs scale scores showed significant increase ( $p = 0.035$ ) for female students from 28.0 in the fifth-grade to 31.4 in the sixth-grade. Within the subscales of SEI, there were no significant changes in any gender-grade groups.

**Conclusion:** Skipping breakfast is considered a contributor to lifestyle-related diseases. Therefore, the results suggest the need for adequate health guidance that encourages improved breakfast habits for students. Maintaining a regular bedtime is one of the most important factors for a stable life rhythm, and the short length of sleep have negative impacts on health. Therefore, the results suggest the need to provide health guidance to fourth- and fifth-grade students encouraging regular sleeping hours and bedtimes before 22:00. The fifth and sixth grades involve the period during which secondary sexual characteristics develop, and thus are characterized by considerable physical and psychological changes. The results suggest the importance of health support initiatives that help students resolve developmental issues of mind and body.

**Keywords:** Elementary school students, Lifestyle habits, Psychosomatic complaints

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## I. Introduction

Rapid changes in the social and living environments, such as the development of information technology, globalization, and the declining birthrate and aging population, are affecting the psychological and physical health of school children. In particular, changes in lifestyle associated with the increase activities during the night, are resulting in disruptive

lifestyle habits and health issues such as the increase in the level of psychosomatic complaints<sup>1)2)</sup>. Day-to-day behavior is important for maintaining a healthy lifestyle. For that, it is necessary to establish healthy lifestyle habits at an early age. It has been reported that self-esteem also plays a significant role in the establishment of healthy lifestyle habits<sup>3)4)</sup>. The basic policy of the current course of study is to cultivate principles based on a zest for life. This then becomes

the basis for raising self-esteem to cultivate principles based on a zest for life. Therefore, education aimed at raising self-esteem is provided by classes in morality. The upper grades of elementary schools are perceived as the period during which children start thinking about healthy lifestyle habits by themselves, acquiring health behavior independently and establishing their lifestyle habits. However many disruptions to the upper-grade students' lifestyle can be expected, especially as they adopt more activities during the night. Most of the research on this topic has been based on cross-sectional surveys<sup>5)</sup>. As such, this study, based on a longitudinal survey, is the first of its nature in this subject area.

This research aims to investigate how changes occur in the health, self-esteem, and lifestyle habits of upper-grade elementary school students according to grade progression.

## II. Method

### 1. Subject

The subjects included 140 fourth-grade and 161 fifth-grade students from two public elementary schools of city A and ward B of X prefecture, Kyushu. In addition, there were 78 fourth-grade and 91 fifth-grade students from one public elementary school in city C of X prefecture. City A is an ordinance-designated city, with a population of approximately 1,530,000; B ward has approximately 200,000 people (as of August 1, 2015). City C has a population of approximately 58,000 (as of the end of July, 2015). The school from city C is in an area where commercial areas and a residential area are mixed, with three schools.

### 2. Survey Method and Implementation Period

A self-administered questionnaire survey of fourth- to sixth-grade students was conducted in December in 2010 and 2011. The first survey was conducted in December 2010 on fourth- and fifth-grade students. In the following year, the survey was repeated with the same students, in the fifth and sixth grades, respectively. The questionnaires were distributed by the homeroom teacher and were immediately completed by the students and returned to the teacher. Children placed their questionnaires in individual envelopes, sealed them, and returned them to keep the

contents of the questionnaires confidential. To ensure accurate data matching with that collected in 2010 and 2011, the participants were requested to indicate their grade level, class number, and student number from both 2010 and 2011 on the 2011 questionnaires.

### 3. Survey Content

The survey included questions on the following: basic attributes, lifestyle habits (eating and sleeping habits), the psychosomatic complaints scale<sup>6)</sup> (hereinafter referred to as "PCs scale") and the Coopersmith Self-Esteem Inventory<sup>7)</sup> (hereinafter referred to as "SEI"). The PCs scale comprises 30 items to show the assessment of adolescent mental and physical health conditions, such as feeling gloomy, lacking tenacity, and having a headache. The PCs scale uses four response categories ranging from "almost always" to "never." The SEI comprises 25 items of the school short-form which showed the four sub-scales of "general self-esteem," "self-esteem among peers," "self-esteem in the home setting," and "self-esteem in a school setting." The SEI employed a dichotomous response scale of "yes" and "no"<sup>7)</sup>.

### 4. Method of Analysis

Points were assigned to each of the PCs scale response categories: "Almost always" (0 points) to "never" (3 points). The total score was calculated by summing the responses to 30 questions. Then, these were used for the analysis. The total scores ranged from 0 to 90 points, where higher scores indicated higher levels of psychosomatic complaints. The reliability and validity of this method have been verified in the previous study<sup>6)</sup>.

The SEI scores were analyzed using four subscales. One point was assigned for self-affirmative responses, and zero points were assigned for negative responses, and analysis was performed using scores that were summed up for each subscale. Higher scores indicated higher levels of self-esteem<sup>7)</sup>.

The data from 2010 and 2011 were matched and analyzed according to gender and grade level using the t-test and Wilcoxon signed-rank test. The research was conducted with the approval of the research ethics committee of Tsukuba University of medicine.

### III. Results

#### 1. Subject Overview

Data from 423 (response rate 90.0%) and 462 students (response rate 98.3%) was collected in 2010 and 2011, respectively. Data from 304 students (response rate 64.7%), for which the data matching between the two years was possible, was used for the analysis. The grade and gender distributions of the 304 students are shown in **Table 1**.

#### 2. Changes in Lifestyle Habits According to Grade Progression

The changes in the lifestyle habits were examined between gender or grade, according to grade progression (**Table 2**). Results showed that the prevalence of female students who ate breakfast daily significantly decreased ( $p = 0.039$ ) from 87 fifth-grade students (94.6%) to 82 sixth-grade students (89.1%). There were no significant changes in the prevalence of male students and female students who ate breakfast daily in any other gender-grade groups. The results also showed a change in sleeping habits between fifth- and sixth-grade male students. The bedtime of male students changed significantly ( $p < 0.001$ ) from 21:58 in the fifth grade to 22:28 in the sixth grade. This trend was also noted with fifth-grade female students whose bedtimes changed ( $p < 0.001$ ) from 21:55 in the fifth grade to 22:25 in the sixth grade. The length of sleep for fifth-grade male students shortened significantly ( $p=0.004$ ) from 8 h 31 min in the fifth grade to 8 h 10 min in the sixth grade. In the same way the length of sleep for fifth-

grade female students shortened significantly ( $p < 0.001$ ) from 8 h 28 min in the fifth grade to 7 h 57 min in the sixth grade.

#### 3. Changes in the PCs Scale Scores and SEI Scores According to Grade Progression

The PCs scale scores were compared between gender or grade, according to grade progression. The scores showed significant increase ( $p = 0.035$ ) for female students from 28.0 in the fifth grade to 31.4 in the sixth grade (**Table 3**). There were no significant differences among the PCs scores in any other gender-grade groups. Within the SEI scales, there were no significant changes in any other gender-grade groups.

### IV. Discussion

#### 1. Changes in Lifestyle Habits According to Grade Progression

There was an increase in the tendency among female students between the fifth and sixth grade to skip breakfast. This result is consistent with reports from the previous cross-sectional study<sup>8)</sup>, which observed that while nearly 90% of the students ate breakfast, the proportion of students who skipped breakfast increased with grade progression. There were no change of the breakfast intake rates in fourth-grade students and fifth-grade male students. It might be assumed that the increase in the breakfast-skipping rate of fifth-grade female students is caused by the increased awareness toward their body especially considering the social preference for slimmer figures. Skipping breakfast among school

**Table 1** The Characteristic of Subjects

	male n(%)	female n(%)	Total n(%)
fourth-grade	71(50.0)	70(43.2)	141(46.4)
fifth-grade	71(50.0)	92(56.8)	163(53.6)
total	142(100.0)	162(100.0)	304(100.0)

**Table 2** Changes in Lifestyle Habits According to Grade Progression

	n	fourth-grade		p value	fifth-grade		p value		
		n(%)or Mean±SD	n(%)or Mean±SD		n(%)or Mean±SD	n(%)or Mean±SD			
eating breakfast daily	male	71	63(88.7)	68(95.8)	0.06	69	59(85.5)	60(87.0)	0.194
	female	70	65(92.9)	65(92.9)	0.48	92	87(94.6)	82(89.1)	0.039
the length of sleep	male	70	8h42min±1h08min	8h48min±1h02min	0.68	66	8h31min±1h15min	8h10min±1h22min	0.004
	female	70	8h44min±54min	8h36min±56min	0.31	93	8h28min±1h	7h57min±1h07min	<0.001
bedtime	male	70	21:47±0:54	21:56±0:44	0.21	66	21:58±1:02	22:28±1:09	<0.001
	female	70	21:53±0:51	22:03±0:50	0.53	93	21:55±0:55	22:25±1:09	<0.001

Note: Wilcoxon signed-rank test

**Table 3** Changes in the PCs Scale Score and SEI Scores According to Grade Progression

		n	fourth-grade	fifth-grade	p value	n	fifth-grade	sixth-grade	p value
			Mean±SD	Mean±SD			Mean±SD	Mean±SD	
PCs Scale Score	male	67	30.12±16.10	26.81±17.01	0.13	64	25.58±17.80	27.86±18.22	0.24
	female	68	27.87±17.87	29.26±16.82	0.51	86	27.97±14.50	31.36±17.63	0.04
Score of General Self	male	66	7.08±2.55	7.00±2.39	0.80	65	6.86±2.67	6.91±3.10	0.90
	female	68	6.75±2.59	6.51±2.70	0.51	88	6.31±2.47	6.00±2.91	0.24
Score of Self among peers	male	69	1.38±1.16	1.28±1.126	0.55	66	1.27±1.16	1.30±1.14	0.82
	female	68	1.41±1.07	1.34±1.15	0.66	92	1.43±1.20	1.37±1.20	0.62
Score of Self in the home setting	male	68	4.35±1.46	4.46±1.53	0.66	67	4.54±1.39	4.67±1.42	0.43
	female	66	4.55±1.36	4.42±1.67	0.56	90	4.62±1.16	4.69±1.42	0.66
Score of Self in the school setting	male	69	1.81±0.99	1.78±1.04	0.85	68	1.94±1.04	1.93±1.11	0.92
	female	69	1.72±1.07	1.65±1.14	0.60	92	1.68±1.08	1.73±1.10	0.67

Note:paired t-test, PCs:psychosomatic complaints

children is mainly caused by “delaying bed-time”<sup>2)9)</sup>. The most important factor affecting the period of sleep and lifestyle of children is the policy of the mother<sup>10)</sup>. Skipping breakfast has a negative impact on health and is considered a cause of lifestyle-related diseases<sup>1)2)5)</sup>. The results suggest the need for adequate health guidance that encourages to improve breakfast habits for students along with their parents.

The results indicated a later bedtime for both male and female students in sixth grade compared with fifth grade. The length of sleep for both male and female students also decreased between the fifth to the sixth grade. Maintaining a regular bedtime is reported to be one of the most important factors for a stable life rhythm<sup>11)</sup>.

The Study Report of the Sleep Guideline for Health Promotion by the Ministry of Health, Labour and Welfare shows that a comfortable sleep can decrease fatigue and stress, prevent accidents, and reduce the risk of lifestyle-related diseases<sup>12)</sup>. For a teenager, the adequate length of sleep that ensures a comfortable rest is considered to be between 8 and 10 hours. The length of sleep children take is a major factor influencing their well-being. There have been reports suggesting that sleeping hours below 9 hours could affect a child’s health<sup>13)</sup>. To minimize late bedtimes and reduced sleeping hours of students in the sixth grade, there is a need to provide health guidance to fourth- and fifth-grade students focusing on the encouragement of regularized sleeping hours and bedtimes before 22:00. It was suggested that the cooperation with parents is important to support and encourage a healthy lifestyle of children.

## 2. Changes in the Level of Psychosomatic Complaints and the Level of Self-Esteem According to Grade Progression

The level of psychosomatic complaints increased

with grade progression, from the fifth to the sixth grade. The fifth and sixth grades involve the period of secondary sexual development, which is characterized by considerable physical and psychological changes. During this period, many students experience difficulties with self-acceptance. Moreover, psychological and physical development does not occur uniformly, which results in an unbalanced state. The increase of psychosomatic complaints during this period could be understood as a reflection of such situations.

Within the subscales of SEI, there were no significant changes.

We conducted this study among three elementary schools of the X prefecture. Because matching by the grade progress analyzed a possible questionnaire, the effective response rate was low. An area was limited in this study. Examination in an enlarged area and an increase in the number of the sample will be necessary in future.

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