

Self-Rated Health and Lifestyle/Food Habits in Japanese Junior High School Students

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Abstract

Adolescence is a crucial period for health status formation. Adolescence is the period during which health-related behaviours, such as nutrition-related behaviours and physical activities, are developed. Self-rated health (SRH) assessment during adolescence is strongly associated with general well-being and psychosomatic symptoms. The current study investigated the relationship between SRH and lifestyle, eating habits and attitudes toward food among junior high school students. A total of 438 students aged 13–15 years and their parents in the Hyogo prefecture of Japan participated in this study. Questionnaires were distributed to the students, who attempted them at home with their parents and returned them via Freepost envelopes. The questionnaires comprised the SRH assessment, lifestyle information, an unidentifiable description of the subject and their guardian's SRH, and 39 parameters regarding food-related habits and attitudes. The χ^2 test or Fisher's exact test were employed to assess any associations between the independent variables and SRH at a 5% level of significance. The differences between the healthy and unhealthy SRH groups were examined for all significant items using a logistic regression analysis after adjusting for sex and age. Of the participants, 188 (42.9%) returned both completed questionnaires. Among the respondents, 53.2% reported feeling very healthy. SRH assessment did not significantly differ with sex, age or school. Eleven parameters were significantly associated with SRH ($P < 0.05$ by χ^2 test). The guardians' SRH had no association with the students' SRH. The excellent SRH group had no headaches [odds ratio (OR): 1.68; confidence interval (CI): 1.29–2.18], went to bed early [OR: 1.88; CI: 1.17–3.02], liked home-cooked meals to a greater extent [OR: 2.55; CI: 1.54–4.22], and had good exercise habits [OR: 2.98; CI: 1.27–6.99] compared with the very good to poor SRH group. High SRH was strongly associated with going to bed early, not having headaches, liking home-cooked meals, and having good exercise habits among Japanese junior high school students.

Keywords: self-rated health (SRH), junior high school students, cross-sectional study

1. Introduction

Self-rated health (SRH) status instruments are subjective by their nature however recent research studies have shown that they can help predict mortality risk (Finch et al., 2002; Robinson-Cohen et al., 2014). In addition, it has become clear that chronic diseases such as obesity, hypertension, diabetes, chronic kidney diseases and dyslipidaemia significantly increase as SRH decreases (Robinson-Cohen et al., 2014; Yamada et al., 2012). In these earlier studies, a consistent inverse association was observed between broadly perceived health status and mortality (Miilunpalo et al., 1997). In this way, SRH is associated with a varied lifestyle and some types of diseases. Thus, this metric has been extensively consulted in the fields of gerontology and public health (Sargent-Cox et al., 2008).

Among the various stages of life, adolescence is an especially crucial period during which concepts and decisions about healthful living are formed, for example regarding smoking, alcohol consumption, drug use,

nutrition-related behaviours and physical activity (Mechanic & Hansell, 1987; Vingilis et al., 2002; Vingilis et al., 2007). It is well known that the moulding of such views is strongly associated with social factors, including income inequality, family support school environment and peer influence (Viner et al., 2012). Therefore, the ideas and values regarding health that adolescents develop are very important because those will influence their future health, productivity, lifespan and their private as well as public medical costs. Indeed, it is widely acknowledged that adult illnesses are more prevalent and problematic among those who have experienced adverse early life health conditions (Danese et al., 2007; Galobardes et al., 2008).

SRH assessments among adolescents are strongly associated with both the status of a student's general well-being as well as psychosomatic symptoms, while providing a good measure of how well health-related issues are understood. Studies show that SRH status reports by adolescents are general health (Malinauskiene et al., 2011; Sharma et al., 2016). However, the adolescent stage of developments is very complex. For example, an adolescent may feel unhappy and become disengaged or disruptive, lose motivation to learn, and enter a downward spiral (Pietarinen, 2000; Kvalsund & Hargeraves, 2009). In extreme cases students who have been shown to be associated with low self-reported health status may drop out of school entirely (Yadav et al., 2010). Therefore, a better understanding of the SRH status of young children and adolescents is essential because it may influence their future health in many profound ways.

In particular, a recent study has shown that dietary intake is significantly related to eating habits, suggesting that dietary behaviours significantly influence health (Sharif et al., 2016). Our previous study indicated that SRH was strongly associated with the frequency of eating breakfast and liking home-cooked meals, for Japanese high school students aged 16–18 years (Osera et al., 2017). To the best of our knowledge, not many studies have specifically investigated the relationship between SRH and lifestyle as well as food choice habits in junior high school students. Therefore, in this investigation, we studied the relationship between SRH and lifestyle, eating habits and attitudes towards food in junior high school students.

2. Method

2.1 Study Design and Data Collection

This cross-sectional study was conducted from June to September 2017 and involved 438 students aged 13-15 years and their guardians, from both rural and urban areas of the Hyogo Prefecture in Japan. Two distinct questionnaires were sent at each student's residence, one for the student and another for his/her guardian. The questionnaires were completed at home and returned using postage-free envelopes supplied by the study.

The questionnaire comprised SRH, lifestyle (e.g. wake-up time); unidentified complaints (e.g. stomach ache) of the subject, the guardian's SRH, and 37 parameters regarding food-related habits and attitudes. The detailed questionnaire comprised SRH, mother's SRH, three demographic characteristics, six lifestyle characteristics (e.g. wake-up time, bedtime, sleeping habits, and self-reported BMI), five miscellaneous health-related parameters (e.g., tiredness, anorexia, dizziness, irritability, and cephalalgia), five parameters related to Breslow's seven healthy habits excluding alcohol consumption and smoking habits (Breslow & Enstrom, 1980), and 23 parameters related to food-related habits and attitudes (e.g. frequency of eating breakfast, food-related concerns, respect for food, watching TV while eating, and talking about food with family members). The questionnaire parameters were determined on the basis of our previous studies (Osera et al., 2016; Osera et al., 2017). Both 4- and 5-point rating scales were used, with higher scores indicating more positive food habits. For example, questions concerning 'respect for food' utilised a 5-point rating scale (5 = high concern, 4 = moderate concern, 3 = concern, 2 = little concern, and 1 = no concern).

2.2 Self-Rated Health Status

Various global SRH questions were used, such as 'How would you rate your overall health?' and the responses were graded on a five-point scale (i.e. excellent, very good, good, fair, and poor) (Joffer et al., 2016; Warnoff et al., 2016; Wu et al., 2013). The SRH scores were grouped into two categories: [a] 'very healthy', which included responses of 'excellent' and [b] 'healthy' which group included responses of 'very good', 'good', 'fair', and 'poor'. All responses were put into one of the two categories: 'excellent' (excellent) versus 'other' (very good to poor).

2.3 Statistical Analyses

The χ^2 test and Fisher's exact test were employed to assess the association between the independent variables and SRH. T-tests were used to compare the 'excellent' group with other SRH groups for each variable. P values < 0.05 were considered statistically significant. Spearman's linear correlation analysis was performed to assess the relationship between SRH and student's lifestyle and food habits.

The differences between the healthy and unhealthy SRH groups were examined for all significant items using a logistic regression analysis after adjusting for sex and age. A dichotomy regression analysis was performed using a stepwise method. Variables that were significant in the bivariate analysis were subjected to logistic regression analysis. A binary regression analysis was performed using the stepwise method. A Hosmer–Lemeshow test was applied to determine the model’s goodness-of-fit. Data were entered and analysed using SPSS statistical software for Windows, version 23.0 (IBM, New York, NY).

2.4 Ethical Statement

The participants were well-informed about the objectives and methods of this study; they voluntarily provided responses to the questionnaire and were free to withdraw from the study at any time. Individual privacy was strictly protected throughout the investigation. Consent signatures were obtained from the guardians of each student. This study was approved by the Kobe Women’s University Ethics Committee Regarding Human Subjects, H29-1.

3. Results

3.1 Sample Characteristics and Item-Specific Responses

Complete responses to the questionnaire parameters and sample characteristics are summarized in Table 1. There were no significant differences between the two groups in terms of age, sex, grade, height, weight, or BMI ($P < 0.05$, Table 1). Of the 438 students and their guardians to whom the two questionnaires, one ‘for students’ and one ‘for guardians’, were sent, 188 (42.9%) returned both completed questionnaires. Of these, 48.4% were female and 51.1% were male; 43.1% of students were in the third, 28.2% were in the second, and 28.7% were in the first year of junior high school. The mean participant age was 14.1 years, and there were no significant differences between excellent vs the other status, nor among the types of schools involved.

Table 1. Distribution of the study samples by sex, grade and age, and SRH

	Variables	Number	Percentage (%)
Sex	Male	91	48.9
	Female	95	51.1
Grade and Age	Grade 1 (13 years old)	54	28.7
	Grade 2 (14 years old)	53	28.2
	Grade 3 (15 years old)	81	43.1
Children’s BMI	Lower 18.5	100	50.5
	18.5 – 25.0	93	47.0
	Over 25.0	5	2.5
Children’s SRH	Excellent	99	53.2
	Very good	70	37.6
	Good	13	7.0
	Fair	3	1.6
	Poor	1	0.5
Mothers’ SRH	Excellent	54	27.1
	Very good	83	41.7
	Good	21	10.6
	Fair	34	17.1
	Poor	7	3.5

Note. SRH, self-rated health.

3.2 Relationship Between SRH and Students’ Food Habits/Attitudes

All lifestyle, food habit, and attitude parameters displayed significant relationships with SRH (Table 2). The results suggested that positive lifestyle and food habits resulted in increased SRH. Among the student respondents, 53.2%

reported feeling excellent. Approximately one-third (37.6%, $n = 70$) of the sample reported feeling very good. The remaining 9.1% reported a 'good' to 'fair' SRH. No students answered 'poor'. Remarkably, the reported SRH value did not significantly differ according to sex, age or school. A considerable variety of factors were significantly associated with SRH ($P < 0.05$, χ^2 tests or Fisher's exact test), including: hours spent sleeping, going shopping for dinner, helping set the table, talking about food, respect for food, food-related concerns, liking home-cooked meals, remembering school lunches during childhood, being irritated, headaches and exercise habits.

Table 2. Bivariate analysis of association between independent variables and SRH

	Self-Rated Health						P-value*
	Excellent			Very Good to Poor			
	N	% ^S	% [#]	N	% ^S	% [#]	
Sleeping time							
After 12 a.m.	4	4.0	20.0	16	18.4	80.0	0.013
10–11 p.m.	50	50.5	54.3	42	48.3	45.7	
9–10 p.m.	36	36.4	59.0	25	28.7	41.0	
8–9 p.m.	7	7.1	63.3	4	4.6	36.4	
Before 8 p.m.	2	2.0	100	0	0.0	0.0	
Go shopping for dinner							
Never	24	24.2	41.4	34	39.1	58.6	0.013
Rarely	42	42.4	60.0	28	32.2	40.0	
Sometimes	7	7.0	50.0	7	8.0	50.0	
Often	18	18.2	50.0	18	20.7	50.0	
Usually	8	8.0	100.0	0	0.0	0.0	
Help set the table							
Never	10	10.1	34.5	19	21.8	65.5	0.003
Rarely	27	27.3	52.9	24	27.6	47.1	
Sometimes	6	6.1	27.3	16	18.4	72.7	
Often	37	37.4	67.3	18	20.7	32.7	
Usually	19	19.2	65.5	10	11.5	34.5	
Talk about food							
Never	4	4.1	33.3	8	9.3	66.7	0.004
Rarely	12	12.2	48.0	13	15.1	52.0	
Sometimes	9	9.2	31.0	20	23.3	69.0	
Often	45	45.9	57.0	34	39.5	43.0	
Usually	28	28.6	71.8	11	12.8	28.2	
Respect for food							
None	1	1.0	100.0	0	0.0	0.0	0.000
Low respect	1	1.0	50.0	1	1.2	50.0	
Medium respect	5	5.1	33.3	10	11.8	66.7	
High respect	24	24.5	41.4	34	40.0	58.6	
Highest respect	67	68.4	62.6	40	47.1	37.4	

Food-related concern							
None	0	0.0	0.0	4	4.7	100.0	
Low Concern	6	6.1	60.0	4	4.7	40.0	
Medium Concern	19	19.4	50.0	19	22.1	50.0	0.002
High Concern	27	27.6	43.5	35	40.7	56.5	
Highest Concern	46	49.6	65.7	24	27.9	34.3	
Liking home-cooked meals							
Dislike	1	1.0	100.0	0	0.0	0.0	
Do not like much	1	1.0	33.3	2	2.3	66.7	
Like moderately	3	3.1	25.0	9	10.5	75.0	0.000
Like a lot	17	17.3	34.7	32	37.2	65.3	
Like very much	76	77.6	63.9	43	50	36.1	
Remembering home-cooked meals during childhood							
Never	5	5.1	62.5	3	3.5	37.5	
Rarely	14	14.3	45.2	17	19.8	54.8	
Sometimes	5	5.1	22.7	17	19.8	77.3	0.015
Often	29	29.6	56.9	22	25.6	43.1	
Usually	45	45.9	62.5	27	31.3	37.5	
Feeling annoyed							
Usually	17	17.2	38.6	27	31.0	61.4	
Often	38	38.4	54.3	32	36.8	45.7	
Sometimes	13	13.1	46.4	15	17.2	53.6	0.041
Rarely	24	24.2	72.7	9	10.3	27.3	
Never	7	7.0	63.6	4	4.6	36.4	
Headache							
Usually	9	9.1	34.6	17	19.5	65.4	
Often	23	23.2	42.6	31	35.6	57.4	
Sometimes	4	4.0	36.4	7	8.0	63.6	0.003
Rarely	34	34.3	60.7	22	25.3	39.3	
Never	29	29.2	74.4	10	11.5	25.6	
Exercise habits							
None	1	1.0	33.3	2	2.5	66.7	
In the future I hope to	14	14.3	37.8	23	28.8	62.2	0.027
Yes, currently	83	84.7	60.1	55	68.8	39.9	

Note. *Significance was assessed using the chi-square test and Fisher's exact test.

\$ % in parenthesis represents the percentage of responses to questions in the subgroup of children.

% value represents the percentage of the group 'excellent health' or 'very good to poor health' in children responding to each questions.

3.3 Correlation Between SRH and Students' Food Habits/Attitudes

Table 3 shows the correlation between SRH and students' food habits/attitudes. SRH was significantly positively correlated with lifestyle, food habits, miscellaneous health issues and Breslow's healthy habits for each variable as shown Table 3.

Table 3. Correlation between SRH and students' lifestyle habits

	Variables	SRH	
Lifestyle	Wake-up time	.155	*
	Bedtime	.195	**
	Hours of sleep	.160	*
Food habits	Eat with family in the morning	.162	*
	Help set the table	.241	**
	Talk with family during dinner	.263	**
	Respect for food	.201	**
	Food-related concerns	.158	*
	Like home-cooked meals	.231	**
	Remember home meals during childhood	.167	*
Miscellaneous health issues+	No Anorexia	.147	*
	No Irritation	.187	*
	No Headache	.273	**
Breslow's health issues	Hours of sleep (between 7 and 8 hours)	.159	*
	Exercise habits	.209	**

Note. SRH, self-rated health.

*Spearman's linear correlation analysis; *P < 0.05, **P < 0.01.

+Miscellaneous health issues include no anorexia, no annoy, no headache.

3.4 Multiple Logistic Regression Analysis

The logistic regression analysis results revealed that SRH was significantly and positively associated with headaches, sleeping habits, liking home-cooked meals, and good exercise habits (Table 4). The students' guardians' SRH had no association with their own SRH. These 11 variables from Table 2 were included in the logistic regression analysis. The 'excellent' SRH group had no headaches [OR: 1.68; CI: 1.29–2.18], went to bed early [OR: 1.88; CI: 1.17–3.02], liked home-cooked meals to a greater extent [OR: 2.55; CI: 1.54–4.22], and had good exercise habits [OR: 2.98; CI: 1.27–6.99] compared with the 'very good to poor' SRH group.

Table 4. Means and 95% confidence intervals of food habits by self-rated health in junior high school students after covariate adjustment

	OR	(95% CI)	P-value
No headache	1.68	(1.29, 2.18)	0.000
Go to bed early	1.88	(1.17, 3.02)	0.009
Liking home-cooked meals	2.55	(1.54, 4.22)	0.000
Having good exercise habits	2.98	(1.27, 6.99)	0.012

Note. OR, Odds ratio; CI, confidence interval.

The multiple regression analysis used a stepwise method.

Liking home-cooked meals indicates that the students prefer meals at home.

Adjusted for gender and age.

4. Discussion

This study revealed that high SRH status among Japanese junior high school students was strongly associated with going to bed early, not having headaches, liking home-cooked meals and having good exercise habits. Each

concept is discussed in further detail below.

A study on adolescents in Peru revealed that 10.2% adolescents had excellent SRH. In addition, Sharma suggested that SRH differed significantly with age group. A significantly higher SRH proportion of 11–14 age group to 15–19 age group (Sharma et al., 2016). Our study revealed that 53.2% adolescents had excellent SRH. Additionally, 90.8% were included in the ‘excellent to good’ SRH groups. A previous study involving Japanese high school students showed that 83.3% students had ‘excellent to very good’ SRH (Osera et al., 2017). The number of Japanese adolescent students with a high SRH than Peru students. Moreover, a study in Greece by Darviri et al. (2011) showed that reporting good SRH (excellent, very good, and good) decreased with age (97.1% in those 15–29 years old, 91.4% in those 30–49 years old, and 74.8% in those older than 50 years). In male Japanese workers aged 38.1 ± 11.7 years, 83.9% reported good SRH (Igarashi & Iijima, 2006). Thus, Japanese SRH may also be very high in the middle-aged individuals.

Tables 2, 3 and 4 suggest that ‘going to bed early’ was associated with SRH. Our results indicate that sleeping habits were related to SRH in junior high school students (Tables 2, 3, and 4). Previous research has also revealed that SRH is associated with sleeping habits. Good sleep and daily physical activity were identified as significant factors influencing positive SRH among children aged 6–16 years (Holmstrom et al., 2014). Additionally, sleep quality has emerged as an important determinant of SRH for most individuals (Darviri et al., 2011). Some researchers have suggested that these observations indicate that morning habits are associated with the health status of adolescents (Sjoberg et al., 2003). Our previous study indicated that morning habits are a very important factor affecting high school students’ SRH (Osera et al., 2017). The current study suggests that students who have good sleeping habits (i.e. going to bed and waking up early) may have enough time to eat breakfast every morning. Most importantly, sleeping habits and attaining 7–8 hours of sleep are very important for young children. Sleeping habits were strongly associated with SRH.

Table 4 shows that liking home-cooked meals was significantly associated with a high SRH score (Tables 2, 3 and 4). During adolescence, the proportion of total nutrition consumed at restaurants, particularly fast-food establishments, significantly increases, whereas the amount of home-cooked meals consumed decreases (Bauer et al., 2009). Several studies have suggested that increasing the proportion of total food consumption obtained from meals prepared at home is essential to enable healthier food choices among overweight/obese adolescents (Watts et al., 2015). According to Watts and colleagues and our previous investigation, as well as the results of the current study, liking towards home-cooked meals is important and may be positively connected with overall health and is consistent with Bowlby’s secure base theory (Bowlby, 2008). According to this author, having a secure base is extremely important for a child’s healthy emotional and physical development.

In the current study, 85.7% of the enrolled students had dinners prepared by their mothers. In light of the positive connection between this pattern and better health, we suggest that students should primarily consume dinners prepared by their parents. This is because the trait of ‘liking home-cooked meals’ is good for a student’s relationships with their parents, due to the nutrition of the home-cooked meal itself, and also because this may increase the stability of spirit and a sense of security. Additionally, achieving a good start at school was found to be important in reporting a positive SRH in 6-year-old children (Holmstrom et al., 2014). One study suggested that mental equanimity appears to be significantly important in enhancing SRH in male workers (Igarashi & Iijima, 2006). Moreover, good sleep and daily physical activity were also identified as significant factors that resulted in high SRH scores among children aged 6–16 years (Holmstrom et al., 2014).

Our results suggest that ‘having good exercise habits’ was associated with good SRH (Tables 2, 3, and 4). Poor SRH was associated with less physical activity in 15–29-year-olds (Darviri et al., 2011). Physical activity is related to SRH and is also an important factor for junior high school students. Additionally, Tables 2, 3, and 4 suggest that ‘no headaches’ was associated with SRH. Another important study revealed that male and female high school students who initiated smoking earlier reported poorer SRH compared with those who initiated smoking later and non-smokers (Piko, 2007). These findings suggest that SRH is a key factor affecting junior high school students’ health. These data were similar to the findings of our previous study on high school students, which described five items related to miscellaneous health issues that displayed a significant relationship with SRH (Osera et al., 2017). High SRH was significantly associated with not being irritated and not suffering with headaches (Tables 2 and 3). If a student has a headache, they may feel that they are unhealthy. Lack of sleep and stress related to daily school activities can cause headaches in students (Visudtibhan et al., 2010). The previous paragraph highlighted that sleep and stability of the spirit or sense of security is related to SRH. Sleeping habits and stability of the spirit or sense of security may also be associated with headaches.

In the current study, we assessed the relative importance of students’ lifestyles and food habits on their SRH via

multiple regression analyses (Table 4). Our findings suggested that SRH is a key factor in junior high school students' health. Most importantly, lifestyle factors, including going to bed early, not having headaches, liking home-cooked meals and good exercise habits, may be associated with junior high school students' SRH. In conclusion, the results of this study could benefit junior high school students.

This results described here and our previous study's results are slightly different. We found a significant difference between the health status of high school and junior high school students (e.g. age, the amount of study time and their sense of independence). In addition, these two studies differed substantially in the number of questionnaires employed, the number of questions asked and how the surveys were distributed, all of which helped lead to a significant difference in the results obtained. However, both studies revealed that both junior and senior high school students are widely involved in health improvement, and that Japanese adolescents generally have high SRH scores.

Although the questionnaires for the current study were distributed with postage-paid return envelopes, only 42.9% of students attempted and returned them. Therefore the students and their guardians who were ultimately included in this study's results may have had greater concerns about their lifestyle and food habits than those who did not return the questionnaires. However, we were unable to determine the magnitude of this possible bias. To further understand this phenomenon, the interventions and cohort studies must be separately evaluated. In addition, in the next study, we try to not only using self-assessment, but also body composition and muscle strength.

This study presents a self-rated health instrument, which may be able to estimate the level of children's well-being and health status. A high SRH status in Japanese junior high school students was strongly associated with going to bed early, not having headaches, liking home-cooked meals and good exercise habits. These students reported better health than those who did not possess these lifestyle characteristics.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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