

Factors Affecting Feelings of School Avoidance in Japanese High School Students: A Longitudinal Study of 10th to 12th Graders

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Background: More than 70% of Japanese high school students are reported to attend school with feelings of school avoidance (FSA). Appropriate support should be provided for those suffering from a serious conflict between their duty of attending school and negative feelings about it.

Objectives: This study aims to investigate FSA in Japanese public high school students during the 3 years of high school and identify the predictive factors of the FSA. Also, to examine effective support methods for teachers and other supporters to help students control FSA and conduct a healthy school life.

Methods: A total of 3,985 10th grade students among public senior high schools in Nagano Prefecture in Japan agreed to participate in the study. A self-administered questionnaire survey was conducted in June 2010. Follow-up surveys were conducted in June 2011 and June 2012. The questionnaire consisted of the FSA Scale and the questions corresponding to the variables are demographic details, mental health factors, communication and social support factors, and learning and lifestyle factors. Descriptive statistics, repeated measures ANOVA and multiple comparison (Bonferroni test), *t*-test, and Cox regression analysis were used for analysis.

Results: Valid responses were obtained from 1,578 students. The means for all subscale scores of FSA of 10th grade students was the lowest. The Cox regression analysis revealed that the following factors showed statistically significant predictors of the FSA: anthropophobic tendency, perceptions of maladjustment in learning settings, experience of mental health problems that needed mental assistance, unsupportive parenting attitudes, having a mobile phone at a younger age, being male, low self-esteem, poorer understanding in the school learning, and experience of being bullied.

Conclusion: It is important for *Yogo* teachers to be knowledgeable of the anthropophobic tendency in detail and experience of mental health problems that needed mental assistance among students early in 10th grade, and make use of such information for support; to provide support that help students acquire skills to build personal relationships and adjust in groups, and foster adequate self-esteem; to provide mind care to deal with the experience of being bullied; to listen to students to identify perceptions of maladjustment and anxiety in learning settings; and to provide the parents with opportunities of learning and consultation.

Keywords: feelings of school avoidance, anthropophobic tendency, high school students, longitudinal study

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I. Introduction

Investigations by the Ministry of Education, Culture, Sports, Science, and Technology (MECSST) have shown that there were 3,315,453 students registered at high schools in Japan, and that 48,579 (1.5%) of these did not attend school regularly, so called “School refusal” students. Among the students who were categorized as

refusing to go to school, dropouts accounted for 12,777 (26.3%) students¹⁾. “School refusal” is defined as absence from school, excluding for reasons caused by illness and financial reasons, for more than 30 days in a year (by refusing school attendance or by being unable to attend school for psychological, emotional, physical reasons, and social traditions or backgrounds)²⁾.

Students who refuse to go to school may suffer from

conflicts between the obligation to go to school and feelings of “not being able to attend school” or “not wishing to attend school”³). In previous studies, more than 70% of high school students are reported to be having “school attendance evasion feelings”, such as “have got tired of” and “do not want to go” to the school they are attending^{4,5}). There is an increase in students spending school attendance in locations away from the assigned classes, such as in the school health room where students can receive health care even if it does not lead to school refusal or dropout from the school⁶). Further, it is reported that students who have stronger feelings of school avoidance (FSA) are more likely to have physical symptoms (abdominal pain, low vitality, feelings of irritation, and body fatigue)⁷). This may cause mental health problems and have deleterious effects on everyday life.

In previous studies of high school students, the factors that have been reported as related to, or possibly related to, FSA include: school grade^{8,9}), gender^{5,10}), family composition and the manner of upbringing by the parent^{9,10}), club activities¹¹), mobile-phone possession^{9,10,12}), the use of the school health room^{9,10,13}), drinking and smoking experience^{9,10}), and various physical psychological social factors^{7-11,14,15}). Further, Aruga¹⁶) reported that factors affecting FSA in the year following the baseline survey (in the 10th grade) were an anthropophobic tendency, experience of mental health problems that needed medical examination, low self-esteem, poor support by parents, mobile phone possession at a younger age, perceptions of maladjustment in learning settings, and smoking experience. As described above there are studies on FSA of high school students, but there have been no studies that have reported the actual situation and the factors affecting FSA in high school over the three years. This study aimed to identify Japanese high school student FSA during the 3 years of high school and the predictive factors of the FSA to examine effective support methods for teachers and other supporters to help students control FSA and conduct a healthy school life.

II. Methods

1. Subjects and Procedures

A total of 22 senior high schools (3,985 10th grade students) among the full-time public senior high schools in Nagano Prefecture in Japan agreed to participate in the study. A questionnaire survey was conducted in June

2010 (baseline survey; Time 1). A self-administered questionnaire was distributed to the students and returned to collection boxes set in the respective home rooms. The questionnaire was accompanied by a document that explained the purpose and methods of the study and the ethical considerations. Follow-up surveys were conducted in June 2011 (Time 2) and June 2012 (Time 3) in a manner similar to the baseline survey. For the baseline survey, the questionnaire was distributed to the 3,985 10th grade students at 22 high schools and 3,750 (94.1%) responses were received. However, there were withdrawals from the follow-up surveys in the subsequent two years. The number of students who completed all three surveys was 1,746 (44.6%). Of these, excluding students with missing values for gender and FSA, 1,578 (42.1%) were finally included in the analyses.

2. Questionnaire Items

(1) Feelings of School Avoidance (FSA)

The FSA was measured by the scale developed by Watanabe and Koishi¹⁷). It consists of three subscales: “bad feelings towards the school” (11 items; scale 11-55), “friendlessness” (9 items; scale 9-45), and “aversion to attending school” (6 items; scale 6-30), where higher scores indicate stronger feelings related to school avoidance. Cronbach’s alpha is 0.89 (0.81-0.87 for the subscales). The alpha coefficients in the present study were 0.85 for “bad feelings towards school”, 0.84 for “friendlessness”, and 0.82 for “aversion to attending school”. Permission to use the FSA Scale was obtained from Koishi in 2009.

Because no cut-off point has been established, the onset of FSA was defined as the value calculated for the 75th percentile of each subscale score in the baseline survey, based on Aruga¹⁶). The scores of the onset of FSA in the present study were 30.0 for “bad feelings towards school”, 20.0 for “friendlessness”, and 18.0 for “aversion to attending school”.

(2) Demographic details

The students were asked about gender, family composition (the number of cohabiting family members and their relationship), and number of days absent in one year. Further, the date of birth and blood type were asked for to be able to combine baseline data with the data of the Time 1 and Time 2 surveys.

(3) Mental health factors

The anthropophobic tendency was measured by the

scale developed by Horii and Ogawa¹⁸⁾¹⁹⁾. It consists of six five-item subscales: (1) hyper-selfconsciousness; (2) fear of being rejected by the group; (3) shyness; (4) scopophobia (the fear of being watched or stared at); (5) fear of losing self-control; and (6) depression. Higher scores for each subscale indicate a stronger anthropophobic tendency. The alpha coefficients in the present study were 0.91 for the overall scale and 0.85-0.90 for the subscales. Permission to use the scale was obtained from Horii in 2009.

Each student was asked about self-esteem, motivation, and stress coping style, as well as whether the respondent had experiences of unidentified complaints, experience of refusing to attend school, experience of being bullied, and about dreams and goals for the future, and if this student had sought medical assistance due to mental depression or illness (mental depression in the following). The questions about stress coping style were prepared, based on the coping taxonomy developed by Pine and Kafry²⁰⁾. The question about self-esteem (“I sometimes think that I am worthless.”) was developed by referring to the Japanese-translated version of the Self-esteem Scale created by Rosenberg²¹⁾, and the results were scored using a visual analog scale (VAS; scale 0-100). The VAS Scale instructions indicated that the left end of a straight line of 100 mm is “completely disagree” and the right end is “very likely”, and the subjects were asked to show the current state by a line (mark) crossing the 100 mm line. The measured value of the length from the left end was used as data. The VAS was used to reduce the effort of answering multiple questions. For self-esteem only, a value obtained by subtracting the measured value from 100 was used as data. The question about motivation (“I feel that I have enough motivation in everything.”) was created by referring to the Apathy Scale developed by Shimosaka²²⁾, and the results were scored using a VAS.

(4) Communication and social support factors

The surveys asked students about means of communication (face-to-face, phone, e-mail, or post), the age of getting a mobile phone (never, elementary school, junior high school, or senior high school), the number of e-mails per day with the mobile-phone, visits to the school health room (rarely, several times per month, several per week, or almost every day or more often), sports club activities, social support (of family, school friends, non-school friends, internet-only acquaintances, opposite-sex friends, homeroom teacher, *Yogo* teacher (school nurse), and club advisor), and attitudes of the parents until junior high school. The questions about

the attitudes of the parents until junior high school (care factor: “I think that my parents have cooperative hearts and understand me.”; overprotection factor: “I think that my parents were too protective toward me.”) were created by referring to the Japanese-translated version of the Parental Bonding Instrument (PBI) developed by Parker and colleagues²³⁾, and the results were scored using a VAS.

The student social skills were evaluated by the Kikuchi’s Scale of Social Skills: 18 Items (KiSS-18), which was developed by Kikuchi²⁴⁾. It is a unifactorial scale of 18 items and higher scores indicate better social skills. The alpha coefficient in the present study was 0.88. Permission to use the KiSS-18 was obtained from Kikuchi in 2009.

(5) Learning and lifestyle factors

The surveys asked students about understanding in the school learning, perceptions of maladjustment in learning settings, and whether the student had experience of drinking alcohol and smoking. The question about understanding in the learning (“I understand the school learning.”) was created by referring to the study by Honma²⁵⁾, and the results were scored using a VAS. The question about perceptions of maladjustment in learning settings (I am not motivated in studying, I do not care about studying anything.”) was created by referring to the School Maladjustment Scale for Elementary School Students developed by Togasaki, Akiyama, and Shimada²⁶⁾, and the results were scored using a VAS.

3. Statistical Analysis

Baseline data were combined with the data of Time 2 and Time 3 by gender, date of birth, and blood type. Descriptive statistics were calculated for all the variables that were included in the study. All subscale scores of the FSA were compared with the school grades and genders. Repeated measures analysis of variance (ANOVA) and multiple comparison (Bonferroni test) were used to assess the statistical significance of the differences between the school grades. In addition, the *t*-test was used to assess the statistical significance of the differences between genders. The means for all subscale scores of FSA were significantly lower in 10th grade students than in 11th and 12th grade students, and there were only small differences between 11th and 12th grade students, so the following procedure was used for the respective subscales to identify predictive factors of the onset of FSA. First, the students were divided into non-

onset and onset of FSA groups based on the baseline data. Second, Cox regression analysis (multivariate analysis) was conducted for the non-onset of FSA group. The independent variables were demographic details, mental health factors, communication and social support factors, and learning and lifestyle factors at the baseline (in the 10th grade). The state variable was the onset of FSA one or two years later (1 = onset, 0 = censored case). The survival variable was the number of years till onset of FSA. Further, using the factors which previous studies have reported for the relation between the FSA⁹⁾¹⁰⁾ and the influence at one year after the baseline¹⁶⁾ as independent variables, Cox regression analysis was conducted. In this study, the Cox regression analysis²⁷⁾ was used to establish the influence (predictor) of the variable of the first year on the onset of FSA. In the Cox regression analysis, the nominal variables (stress coping style, means of communication, and visits to the school health room) were expressed by a combination of the binary variables as follows: active-inactive and direct-indirect dimensions (stress coping style); face-to-face or not (means of communication); and rarely or others (visits to the school health room). To avoid multicollinearity, it was confirmed that the absolute value of the correlation coefficient between independent variables was not above 0.9. The interval scales (anthropophobic tendency, self-esteem, motivation, attitudes of the parents until junior high school, understanding of school learning, and perceptions of maladjustment in learning settings) were converted to categorical data by referring to each quartile, since the influence was not necessarily linear. The SPSS Statistics

Package for Windows 23.0 was used for the statistical analyses.

4. Ethical Considerations

The cooperation of the principal and head teacher at each high school was requested by explaining the purpose of this study orally and in writing. The study objectives and methods were explained to the participating students in writing. They were informed that their anonymity would be guaranteed, that their participation and withdrawal would be of their own free will, and that refusal to participate or the withdrawal of consent would not result in any negative consequence. The protocol of this study was approved by the Ethics Review Committee of Nagano College of Nursing.

III. Results

1. The FSA Scale for the Participants

Table 1 shows the mean scores of the FSA subscales according to the school grade and gender. The means for all subscale scores of FSA in both males and females were significantly lower in 10th grade students than in 11th and 12th grade students ($P < 0.01$, all). The scores of 11th and 12th grade students varied differently for the subscales. The “bad feelings towards school” subscale scores were higher in the 11th grade students than in the 12th grade students, both for males and females. The “friendlessness” subscale scores were higher in the 12th

Table 1 The mean scores of the FSA subscales according to the school grade and gender

	n	Baseline (10 th grade)			Time 2 (11 th grade)			Time 3 (12 th grade)			Significance	
		Total subjects Mean	(SD)	onset n	Total subjects Mean	(SD)	onset n	Total subjects Mean	(SD)	onset n	ANOVA	Bonferroni test
Bad feelings towards school												
Male	553	25.59	(6.4)	154	27.58	(6.5)	99	27.36	(6.8)	37	**	T1 < T2**, T1 < T3**
Female	1025	24.96	(6.5)	241	26.09	(6.7)	128	25.78	(7.0)	73	**	T1 < T2**, T1 < T3**
Friendlessness												
Male	553	17.07	(5.7)	164	17.88	(6.0)	86	18.23	(6.2)	47	**	T1 < T2**, T1 < T3**
Female	1025	16.21	(5.6)	249	16.90	(5.6)	139	17.45	(5.5)	89	**	T1 < T2**, T1 < T3**, T2 < T3**
Aversion to attending school												
Male	553	13.66	(5.0)	130	15.18	(5.0)	93	14.72	(5.0)	44	**	T1 < T2**, T1 < T3**, T2 > T3*
Female	1025	13.80	(5.5)	264	15.37	(5.4)	165	15.43	(5.4)	93	**	T1 < T2**, T1 < T3**

Repeated measures ANOVA and multiple comparison (Bonferroni test) were used to assess the statistical significance of the differences in the scores of between the school grades. *T*-test was used to assess the statistical significance of the differences in the scores of between genders. Significant differences in scores between genders shows in italics. Onset: Bad feelings towards school ≥ 30 , Friendlessness ≥ 20 , Aversion to attending school ≥ 18 . * $P < 0.05$, ** $P < 0.01$. T1, Baseline; T2, Time 2; T3, Time 3. SD, standard deviation.

grade students than in the 11th grade students, both for males and females. In the “aversion to attending school” subscale, the 11th grade student scores were higher than for 12th grade males, while here the 12th grade student scores were higher than for the 11th grade females.

For the scores of both genders, there were significant differences in all subscale scores of the FSA for the 12th grade students ($P < 0.01$, all). The “bad feelings towards school” and “friendlessness” subscale scores were higher for males than for females in all grades. The “aversion to attending school” subscale scores were higher for females than for males in all grades.

2. The Predictive Factors of the FSA for the Participants

Table 2 shows onset of the FSA hazard ratios (HR) and 95% confidence intervals (95% CI) for the demographic details, mental health factors, communication and social support factors, and learning and lifestyle factors. The onset risk for all subscales of FSA were anthropophobic tendency, unidentified complaints, self-esteem, visit to the school health room, attitudes of the parents (care factors), social skills, experience of drinking alcohol, and experience of smoking.

Table 3 shows the results of the Cox regression analysis. The predictive factors of the “bad feelings towards school” subscale were gender (“male” HR for “female” was 1.52; 95% CI, 1.78 to 1.95), anthropophobic tendency (“very high” HR for “very low” was 1.80; 95% CI, 1.21 to 2.67), the age of getting a mobile phone (“ $\leq 6^{\text{th}}$ grade” HR for “ $\geq 10^{\text{th}}$ grade” was 1.76; 95% CI, 1.16 to 2.68), attitudes of the parents (care factors) (“very low” HR for “very high” was 1.87; 95% CI, 1.31 to 2.68), understanding in the school learning (“very low” HR for “very high” was 1.42; 95% CI, 1.00 to 2.00), and perceptions of maladjustment in learning settings (“very high” HR for “very low” was 2.07; 95% CI, 1.45 to 2.96). The predictive factors of the “friendlessness” subscale were gender (“male” HR for “female” was 1.27; 95% CI, 1.01 to 1.61), anthropophobic tendencies (“very high” HR for “very low” was 2.40; 95% CI, 1.64 to 3.50), mental depression (“yes” HR for “no” was 2.05; 95% CI, 1.17 to 3.57), experience of being bullied (“yes” HR for “no” was 1.33; 95% CI, 1.02 to 1.73), and attitudes of the parents (care factors) (“very low” HR for “very high” was 1.55; 95% CI, 1.11 to 2.15). The predictive factors of the “aversion to attending school” subscale were anthropophobic tendencies (“very high” HR for “very low” was 2.49;

95% CI, 1.75 to 3.53), and self-esteem (“very low” HR for “very high” was 1.45; 95% CI, 1.04 to 2.02).

IV. Discussion

1. Characteristics of the FSA during the 3 Years of High School

This study showed that the FSA incidence of high school students increased from 10th to 11th grade, after that, the “bad feelings towards school” tended to decrease, the “friendlessness” increased, and the “aversion to attending school” decreased among males and increased among females. Cross-sectional studies of junior high school students by Ikeda et al.²⁸⁾ and Motoyasu and Sakugawa²⁹⁾ have also reported that the number of students with FSA increased with the student grade. In the cross-sectional studies of junior high school students, there was also a report that the 11th grade student FSA had the highest incidence³⁰⁾. According to a cross-sectional study investigating senior high school students in 2012 by Aruga, Suzuki, and Tagaya⁹⁾, the mean scores (standard deviation (SD)) of the “bad feelings towards school” of the 10th, 11th, and 12th grade students were 26.59 (6.29), 27.11 (6.78), and 27.92 (6.57), those of the “friendlessness” were 16.80 (5.57), 18.35 (5.68), and 18.93 (5.66), and those of the “aversion to attending school” were 14.07 (5.06), 15.55 (5.26), and 15.50 (5.36), respectively. The scores of all the scales in the present study tend to be lower than those of the study by Aruga, Suzuki, and Tagaya⁹⁾. However, in both studies the FSA among senior high school students tended to increase from the 10th to 11th grades, and remain almost unchanged from the 11th to 12th grades.

2. Predictive factors for onset of FSA

The results of this study suggest that perceptions of maladjustment in learning settings, unsupportive parenting attitudes, anthropophobic tendency, having a mobile phone at a younger age, being male, and poorer understanding in the school learning were significant predictors of the “bad feelings towards school”, and that anthropophobic tendency, experience of mental health problems that needed medical examination, unsupportive attitudes of parents, experience of being bullied, and being male were significant predictors of the “friendlessness”. The results also suggest that anthropophobic tendency and lower self-esteem were significant predictors of the “aversion to attending

Table 2 Onset of the FSA subscales hazard ratios and 95% confidence intervals for demographic details, mental health factors, communication and social support factors, and learning and lifestyle factors

	Bad feelings towards school (n = 1183)				Friendlessness (n = 1165)				Aversion to attending school (n = 1184)			
	onset (≥ 30) (n = 337)		non-onset (< 30) (n = 846)		onset (≥ 20) (n = 361)		non-onset (< 20) (n = 804)		onset (≥ 18) (n = 395)		non-onset (< 18) (n = 789)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Demographic details												
Gender												
Female	201	(25.6)	583	(74.4)	1		228	(29.4)	548	(70.6)	1	
Male	136	(34.1)	263	(65.9)	1.38	1.11-1.71 **	133	(34.2)	256	(65.8)	1.19	0.96-1.47
Family without a female parent												
No	329	(28.3)	833	(71.7)	1		352	(30.8)	791	(69.2)	1	
Yes	8	(38.1)	13	(61.9)	1.34	0.67-2.71	9	(40.9)	13	(59.1)	1.32	0.68-2.56
Family without a male parent												
No	296	(27.7)	772	(72.3)	1		333	(31.3)	732	(68.7)	1	
Yes	41	(35.7)	74	(64.3)	1.32	0.95-1.83	28	(28.0)	72	(72.0)	0.89	0.61-1.31
Living together Grandfather and Grandmother												
No	196	(28.9)	483	(71.1)	1		217	(32.8)	444	(67.2)	1	
Yes	141	(28.0)	363	(72.0)	0.96	0.77-1.19	144	(28.6)	360	(71.4)	0.86	0.70-1.06
Mental health factors												
Anthropophobic tendency (scale 0-180)												
Very low	64	(18.4)	283	(81.6)	1		64	(18.1)	290	(81.9)	1	
Slightly low	68	(23.0)	228	(77.0)	1.27	0.90-1.77	87	(27.7)	227	(72.3)	1.59	1.15-2.20 **
Slightly high	90	(34.0)	175	(66.0)	1.93	1.40-2.66 **	107	(40.1)	160	(59.9)	2.41	1.77-3.29 **
Very high	101	(44.3)	127	(55.7)	2.59	1.90-3.55 **	86	(46.7)	98	(53.3)	2.89	2.09-4.00 **
Unidentified complaints												
No	267	(26.9)	724	(73.1)	1		281	(29.1)	684	(70.9)	1	
Yes	69	(37.3)	116	(62.7)	1.44	1.10-1.87 **	80	(40.8)	116	(59.2)	1.47	1.15-1.88 **
Mental depression (medical treatment)												
No	329	(28.5)	826	(71.5)	1		341	(30.1)	791	(69.9)	1	
Yes	8	(32.0)	17	(68.0)	1.15	0.57-2.31	17	(60.7)	11	(39.3)	2.32	1.42-3.77 **
Experience of refusing to attend school												
No	319	(28.6)	796	(71.4)	1		338	(30.5)	770	(69.5)	1	
Yes	18	(27.3)	48	(72.7)	0.97	0.60-1.56	23	(42.6)	31	(57.4)	1.50	0.98-2.29
Experience of being bullied												
No	246	(27.1)	663	(72.9)	1		261	(28.3)	660	(71.7)	1	
Yes	89	(33.1)	180	(66.9)	1.25	0.98-1.59	99	(41.3)	141	(58.8)	1.55	1.23-1.95 **
Having future dreams and goals												
Yes	250	(27.9)	647	(72.1)	1		262	(30.7)	591	(69.3)	1	
No	87	(30.5)	198	(69.5)	1.11	0.87-1.42	99	(31.8)	212	(68.2)	1.04	0.83-1.31
Self-esteem (VAS scale 0-100)												
Very high	68	(20.8)	259	(79.2)	1		83	(25.7)	240	(74.3)	1	
Slightly high	76	(23.7)	245	(76.3)	1.15	0.83-1.59	81	(25.4)	238	(74.6)	0.98	0.73-1.34
Slightly low	95	(33.7)	187	(66.3)	1.67	1.23-2.29 **	89	(32.8)	182	(67.2)	1.30	0.96-1.75
Very low	93	(39.2)	144	(60.8)	1.96	1.44-2.69 **	107	(44.4)	134	(55.6)	1.83	1.37-2.44 **
Motivation (VAS scale 0-100)												
Very high	85	(26.0)	242	(74.0)	1		78	(25.2)	232	(74.8)	1	
Slightly high	83	(28.5)	208	(71.5)	1.09	0.80-1.47	93	(31.0)	207	(69.0)	1.23	0.91-1.66
Slightly low	78	(26.8)	213	(73.2)	1.03	0.76-1.40	92	(31.6)	199	(68.4)	1.27	0.94-1.71
Very low	83	(32.2)	175	(67.8)	1.25	0.92-1.69	93	(37.1)	158	(62.9)	1.53	1.13-2.07 **
Stress coping style (active-inactive)												
Active	193	(27.5)	509	(72.5)	1		209	(30.7)	472	(69.3)	1	
Inactive	140	(29.7)	332	(70.3)	1.08	0.87-1.34	150	(31.5)	326	(68.5)	1.03	0.83-1.27
Stress coping style (direct-indirect)												
Direct	291	(27.4)	772	(72.6)	1		311	(30.0)	727	(70.0)	1	
Indirect	42	(37.8)	69	(62.2)	1.42	1.03-1.97 *	48	(40.3)	71	(59.7)	1.41	1.04-1.91 *
Communication and social support factors												
Communication means												
Face-to-face	215	(27.1)	577	(72.9)	1		239	(31.3)	525	(68.7)	1	
Others	122	(31.2)	269	(68.8)	1.16	0.93-1.45	122	(30.4)	279	(69.6)	0.97	0.78-1.21
The age of getting a mobile phone												
≥ 10 th grade	191	(26.1)	541	(73.9)	1		226	(31.6)	490	(68.4)	1	
7th-9th grade	97	(29.6)	231	(70.4)	1.16	0.91-1.48	100	(28.9)	246	(71.1)	0.91	0.72-1.15
≤ 6 th grade	30	(40.0)	45	(60.0)	1.61	1.10-2.36 *	21	(29.6)	50	(70.4)	0.92	0.59-1.45
None	12	(40.0)	18	(60.0)	1.65	0.92-2.95	7	(50.0)	7	(50.0)	1.71	0.81-3.63
The number of e-mails per day with the mobile-phone												
Rarely	31	(35.6)	56	(64.4)	1		21	(41.2)	30	(58.8)	1	
Others	306	(27.9)	790	(72.1)	0.77	0.54-1.12	340	(30.5)	774	(69.5)	0.70	0.45-1.08
Visit to the school health room												
Rarely	306	(27.6)	802	(72.4)	1		324	(30.0)	755	(70.0)	1	
Others	31	(41.3)	44	(58.7)	1.57	1.09-2.28 *	37	(43.0)	49	(57.0)	1.50	1.07-2.10 *
Sports club activities												
Yes	206	(27.8)	535	(72.2)	1		214	(29.0)	524	(71.0)	1	
No	122	(29.2)	296	(70.8)	1.06	0.85-1.33	137	(34.3)	263	(65.8)	1.20	0.97-1.49
Social support												
Yes	290	(27.6)	759	(72.4)	1		324	(30.6)	735	(69.4)	1	
No	38	(36.2)	67	(63.8)	1.33	0.95-1.87	31	(37.8)	51	(62.2)	1.28	0.89-1.85
Support of family												
Yes	161	(23.4)	527	(76.6)	1		196	(29.7)	464	(70.3)	1	
No	176	(35.6)	319	(64.4)	1.57	1.27-1.94 **	165	(32.7)	340	(67.3)	1.10	0.90-1.35
Support of school friends												
Yes	224	(27.0)	606	(73.0)	1		261	(29.3)	630	(70.7)	1	
No	113	(32.0)	240	(68.0)	1.21	0.96-1.52	100	(36.5)	174	(63.5)	1.26	1.00-1.58
Support of non-school friends												
Yes	173	(27.9)	446	(72.1)	1		201	(30.3)	462	(69.7)	1	
No	164	(29.1)	400	(70.9)	1.04	0.84-1.29	160	(31.9)	342	(68.1)	1.05	0.85-1.29
Support of internet-only acquaintances												
No	321	(28.1)	820	(71.9)	1		339	(30.2)	782	(69.8)	1	
Yes	16	(38.1)	26	(61.9)	1.42	0.86-2.35	22	(50.0)	22	(50.0)	1.80	1.17-2.78 **
Support of opposite-sex friends												
No	316	(28.1)	808	(71.9)	1		334	(30.5)	761	(69.5)	1	
Yes	21	(35.6)	38	(64.4)	1.33	0.86-2.07	27	(38.6)	43	(61.4)	1.30	0.88-1.92

Cox regression analysis (univariate analysis): * $P < 0.05$, ** $P < 0.01$. HR, hazard ratio. CI, confidence interval.

Table 2 Continued

	Bad feelings towards school (n = 1183)				Friendlessness (n = 1165)				Aversion to attending school (n = 1184)			
	onset (≥ 30) (n = 337)		non-onset (< 30) (n = 846)		onset (≥ 20) (n = 361)		non-onset (< 20) (n = 804)		onset (≥ 18) (n = 395)		non-onset (< 18) (n = 789)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Support of homeroom teacher												
No	311	(29.1)	759	(70.9)	327	(30.4)	747	(69.6)	354	(32.7)	730	(67.3)
Yes	26	(23.0)	87	(77.0)	34	(37.4)	57	(62.6)	41	(41.0)	59	(59.0)
				0.77	0.52-1.15		1.27	0.89-1.81		1.26	0.91-1.75	
Support of <i>Yogo</i> teacher												
No	330	(28.2)	839	(71.8)	354	(30.7)	799	(69.3)	390	(33.2)	786	(66.8)
Yes	7	(50.0)	7	(50.0)	7	(58.3)	5	(41.7)	5	(62.5)	3	(37.5)
				1.79	0.85-3.78		2.03	0.96-4.30		1.81	0.75-4.37	
Support of club advisor												
No	327	(28.6)	818	(71.4)	351	(31.0)	782	(69.0)	382	(33.3)	764	(66.7)
Yes	10	(26.3)	28	(73.7)	10	(31.3)	22	(68.8)	13	(34.2)	25	(65.8)
				0.90	0.48-1.69		1.01	0.54-1.89		1.05	0.60-1.82	
Attitudes of the parents (care factors) (VAS scale 0-100)												
Very high	59	(17.8)	272	(82.2)	71	(22.8)	240	(77.2)	87	(27.8)	226	(72.2)
Slightly high	87	(27.4)	230	(72.6)	98	(31.2)	216	(68.8)	101	(31.0)	225	(69.0)
Slightly low	85	(32.6)	176	(67.4)	84	(31.1)	186	(68.9)	102	(37.1)	173	(62.9)
Very low	99	(38.4)	159	(61.6)	103	(40.4)	152	(59.6)	103	(39.9)	155	(60.1)
				1.58	1.13-2.20 **		1.39	1.02-1.88 *		1.15	0.86-1.53	
				1.88	1.35-2.63 **		1.38	1.01-1.89 *		1.40	1.05-1.87 *	
				2.28	1.65-3.14 **		1.88	1.39-2.55 **		1.53	1.15-2.03 **	
Attitudes of the parents (overprotection factors) (VAS scale 0-100)												
Very low	83	(26.6)	229	(73.4)	88	(29.5)	210	(70.5)	102	(32.4)	213	(67.6)
Slightly low	79	(26.6)	218	(73.4)	102	(32.9)	208	(67.1)	108	(34.4)	206	(65.6)
Slightly high	82	(28.9)	202	(71.1)	68	(26.3)	191	(73.7)	92	(33.9)	179	(66.1)
Very high	89	(31.4)	194	(68.6)	102	(34.8)	191	(65.2)	92	(32.6)	190	(67.4)
				1.00	0.74-1.36		1.12	0.84-1.49		1.07	0.81-1.40	
				1.09	0.80-1.48		0.88	0.64-1.21		1.05	0.80-1.40	
				1.20	0.89-1.63		1.18	0.89-1.57		1.01	0.76-1.34	
Social skill (scale 18-90)												
Very high	74	(24.0)	234	(76.0)	69	(22.8)	234	(77.2)	79	(25.5)	231	(74.5)
Slightly high	74	(25.3)	218	(74.7)	88	(29.5)	210	(70.5)	96	(31.8)	206	(68.2)
Slightly low	86	(28.8)	213	(71.2)	103	(33.3)	206	(66.7)	110	(34.0)	214	(66.0)
Very low	96	(36.9)	164	(63.1)	91	(38.9)	143	(61.1)	106	(45.7)	126	(54.3)
				1.58	1.16-2.13 **		1.32	0.97-1.81		1.30	0.97-1.75	
				1.21	0.89-1.65		1.53	1.12-2.07 **		1.42	1.07-1.90 *	
				1.58	1.16-2.13 **		1.80	1.32-2.47 **		1.93	1.45-2.59 **	
Learning and lifestyle factors												
Understanding in the school learning (VAS scale 0-100)												
Very high	74	(23.2)	245	(76.8)	83	(28.9)	204	(71.1)	88	(28.5)	221	(71.5)
Slightly high	83	(26.4)	231	(73.6)	81	(29.5)	194	(70.5)	92	(30.9)	206	(69.1)
Slightly low	86	(28.8)	213	(71.2)	91	(30.4)	208	(69.6)	103	(33.3)	206	(66.7)
Very low	89	(36.9)	152	(63.1)	104	(35.1)	192	(64.9)	111	(42.4)	151	(57.6)
				1.16	0.85-1.59		1.03	0.76-1.39		1.11	0.83-1.48	
				1.26	0.93-1.72		1.06	0.79-1.43		1.20	0.90-1.59	
				1.67	1.23-2.28 **		1.23	0.92-1.65		1.58	1.20-2.09 **	
Perceptions of maladjustment in learning settings (VAS scale 0-100)												
Very low	65	(18.0)	296	(82.0)	94	(30.6)	213	(69.4)	97	(28.6)	242	(71.4)
Slightly low	82	(25.0)	246	(75.0)	82	(27.7)	214	(72.3)	88	(28.8)	218	(71.2)
Slightly high	94	(34.2)	181	(65.8)	85	(30.7)	192	(69.3)	108	(36.2)	190	(63.8)
Very high	90	(43.9)	115	(56.1)	97	(35.4)	177	(64.6)	98	(42.4)	133	(57.6)
				1.42	1.03-1.97 *		0.90	0.67-1.20		1.01	0.76-1.35	
				1.99	1.45-2.73 **		1.01	0.75-1.35		1.32	1.01-1.74 *	
				2.65	1.92-3.64 **		1.17	0.88-1.56		1.57	1.19-2.08 **	
Experience of drinking alcohol												
No	229	(26.2)	646	(73.8)	234	(28.4)	589	(71.6)	256	(30.4)	585	(69.6)
Yes	107	(35.1)	198	(64.9)	127	(37.5)	212	(62.5)	138	(40.6)	202	(59.4)
				1.38	1.10-1.74 **		1.36	1.09-1.68 **		1.39	1.13-1.71 **	
Experience of smoking												
No	326	(28.1)	833	(71.9)	343	(30.5)	783	(69.5)	381	(33.0)	775	(67.0)
Yes	11	(50.0)	11	(50.0)	18	(50.0)	18	(50.0)	13	(52.0)	12	(48.0)
				1.99	1.09-3.64 *		1.74	1.08-2.79 *		1.79	1.03-3.12 *	

Cox regression analysis (univariate analysis). * $P < 0.05$, ** $P < 0.01$. HR, hazard ratio. CI, confidence interval.

school". The results of this study were very similar to the factors that affect the onset of FSA one year after the baseline reported by Aruga¹⁶.

The anthropophobic tendencies in the 10th grade were significant predictors for all the FSA subscales, in particular, they were shown to be the most important predictors for the "friendlessness" and "aversion to attending school". In previous studies, it has been reported that anthropophobic tendencies are significantly related to the FSA⁹⁾¹⁰⁾³¹⁾ and that they affected the onset of FSA one year after the baseline¹⁶⁾. The age at which anthropophobic tendencies and related illnesses commonly occur is from the second half of junior high school to the first half of senior high school³²⁾, and the increased self-consciousness that people begin to feel fear of being seen or stared at by others is one of the characteristics of psychological changes at adolescence³³⁾. There may be a strong possibility of having anthropophobic tendencies at this period of psychological instability when a person matures and becomes an adult. It is presumed that such an increase in anthropophobic tendencies has a strong influence on the FSA. It would be useful to measure the anthropophobic tendencies of

students at an earlier stage of high school attendance, to help them acquire skills to build personal relationships and adjust in groups at the school health room and school counseling facilities.

Previous studies have reported a significant relationship between the experience of mental health problems that needed medical assistance and the "aversion to attending school"⁹⁾ and that it was a factor in the onset of the "aversion to attending school" one year after the baseline¹⁶⁾. The results of this study suggest that the experience of mental health problems that needed medical assistance was a significant predictor for the "friendlessness". In this study, we did not inquire whether the mental health problem was a psychiatric disorder, but this is the time when such students are at high risk of developing mental disorders including schizophrenia, mood disorders, eating disorders, anxiety disorders. *Yogo* teachers (school nurses) need to quickly and accurately be knowledgeable of the experience of mental health problems that needed mental assistance as well as the anthropophobic tendencies described above and provide support to the students.

This study suggests that the experience of being bullied

Table 3 The predictive factors of the FSA subscales by high school students

Category	Bad feelings towards school (n= 1183)			Friendlessness (n = 1165)			Aversion to attending school (n = 1184)			
	β	HR	95%CI	β	HR	95%CI	β	HR	95%CI	
Demographic details										
Gender	Female		1		1			1		
	Male	0.42	1.52	1.78-1.95 **	0.24	1.27	1.01-1.61 *	-0.05	0.95	0.75-1.19
Living together Grandfather and Grandmother	No		1		1			1		
	Yes				-0.21	0.81	0.65-1.01			
Mental health factors										
Anthropophobic tendency	Very low		1		1			1		
	Slightly low	0.03	1.03	0.71-1.49	0.39	1.48	1.05-2.08 *	0.35	1.43	1.03-1.97 *
	Slightly high	0.51	1.66	1.14-2.41 **	0.79	2.21	1.57-3.11 **	0.74	2.10	1.52-2.90 **
	Very high	0.59	1.80	1.21-2.67 **	0.87	2.40	1.64-3.50 **	0.91	2.49	1.75-3.53 **
Unidentified complaints	No		1		1			1		
	Yes	-0.03	0.97	0.71-1.32	0.01	1.01	0.76-1.34	0.21	1.24	0.95-1.62
Mental depression (medical treatment)	No		1		1			1		
	Yes	0.20	1.22	0.55-2.73	0.72	2.05	1.17-3.57 *	0.51	1.66	0.90-3.07
Experience of refusing to attend school	No		1		1			1		
	Yes	-0.25	0.78	0.45-1.36	-0.15	0.86	0.51-1.45	0.14	1.15	0.74-1.81
Experience of being bullied	No		1		1			1		
	Yes				0.28	1.33	1.02-1.73 *	0.14	1.16	0.90-1.48
Having future dreams and goals	Yes		1					1		
	No	-0.16	0.85	0.65-1.12				-0.01	0.99	0.78-1.26
Self-esteem	Very high		1		1			1		
	Slightly high	-0.07	0.94	0.65-1.34	-0.25	0.78	0.56-1.08	0.00	1.00	0.73-1.38
	Slightly low	0.25	1.29	0.90-1.84	-0.02	0.98	0.70-1.38	0.29	1.33	0.97-1.84
	Very low	0.18	1.20	0.82-1.77	0.07	1.07	0.76-1.52	0.37	1.45	1.04-2.02 *
Motivation	Very high		1					1		
	Slightly high	-0.01	0.99	0.71-1.38						
	Slightly low	-0.23	0.79	0.56-1.12						
	Very low	-0.16	0.86	0.61-1.21						
Stress coping style (active-inactive)	Active		1		1			1		
	Inactive	-0.05	0.95	0.75-1.21	0.01	1.01	0.80-1.28			
Stress coping style (direct-indirect)	Direct		1		1			1		
	Indirect				0.30	1.35	0.95-1.91			
Communication and social support factors										
The age of getting a mobile phone	≥ 10th grade		1					1		
	7th-9th grade	0.22	1.24	0.96-1.61						
	≤ 6th grade	0.57	1.76	1.16-2.68 **						
	None	0.22	1.24	0.63-2.46						
The number of e-mails per day with the mobile-phone	Rarely		1		1			1		
	Others	-0.19	0.82	0.55-1.24	-0.13	0.88	0.55-1.41			
Visit to the school health room	Rarely		1		1			1		
	Others	0.26	1.29	0.82-2.02	0.22	1.24	0.85-1.81	0.30	1.35	0.93-1.95
Support of family	Yes		1					1		
	No	0.11	1.12	0.87-1.43						
Support of school friends	Yes		1		1			1		
	No	-0.04	0.96	0.74-1.25	0.09	1.09	0.85-1.40	0.11	1.11	0.88-1.41
Support of internet-only acquaintances	No		1					1		
	Yes	-0.08	0.92	0.50-1.70				0.42	1.52	0.96-2.39
Support of homeroom teacher	No		1					1		
	Yes	-0.19	0.82	0.53-1.29						
Attitudes of the parents (care factors)	Very high		1		1			1		
	Slightly high	0.43	1.54	1.08-2.20 *	0.33	1.39	1.01-1.92 *	0.01	1.01	0.75-1.36
	Slightly low	0.56	1.76	1.22-2.53 **	0.28	1.32	0.94-1.86	0.23	1.25	0.92-1.71
	Very low	0.63	1.87	1.31-2.68 **	0.44	1.55	1.11-2.15 **	0.17	1.18	0.87-1.60
Learning and lifestyle factors										
Understanding in the school learning	Very high		1		1			1		
	Slightly high	0.03	1.03	0.73-1.45	-0.09	0.92	0.66-1.27	-0.06	0.94	0.69-1.28
	Slightly low	0.12	1.13	0.80-2.60	-0.06	0.94	0.69-1.30	-0.03	0.97	0.71-1.31
	Very low	0.35	1.42	1.00-2.00 *	-0.08	0.92	0.67-1.27	0.23	1.26	0.93-1.70
Perceptions of maladjustment in learning settings	Very low		1					1		
	Slightly low	0.20	1.22	0.86-1.73				-0.19	0.83	0.61-1.12
	Slightly high	0.47	1.60	1.13-2.26 **				0.03	1.03	0.76-1.38
	Very high	0.73	2.07	1.45-2.96 **				0.19	1.21	0.90-1.63
Experience of drinking alcohol	No		1					1		
	Yes	0.24	1.27	0.98-1.64						
Experience of smoking	No		1					1		
	Yes	0.33	1.39	0.70-2.75				0.40	1.49	0.80-2.79

Cox regression analysis. In each subscale, the selected variables were different. The results are summarized in one table. Onset: Bad feelings towards school ≥ 30, Friendlessness ≥ 20, Aversion to attending school ≥ 18. *P < 0.05, **P < 0.01. HR, hazard ratio. CI, confidence interval.

is a significant predictor of the “friendlessness”. Previous studies have reported that significant correlations between the experience of being bullied and two subscales (“friendlessness”¹⁰) and “aversion to attending school”

⁹) and that it was among the factors affecting the onset of the “friendlessness” one year after the baseline¹⁶). It has also been reported that the experience of being bullied has long-term physical and psychological effects³⁴⁻³⁶).

Therefore, the results of this study also suggest that having been bullied will have a long range impact, suggesting the importance of conducting mind care at high schools for the students there.

The present study suggests that lower self-esteem in the 10th grade was a significant predictor of the “aversion to attending school”. In previous studies, it has been reported that self-esteem was significantly related to the FSA⁹⁾¹⁰⁾ and that it was a factor in the onset of FSA one year after the baseline¹⁶⁾. It is pointed out that low self-esteem may lead to apathy, desperate behaviors, and delinquency³⁷⁾. From early in 10th grade, teachers need to provide support so that students can acknowledge themselves positively and provide support to foster adequate self-esteem.

This study suggests that having a mobile phone at a younger age is a significant predictor of the “bad feelings towards school”. A previous study has reported that significant correlations between mobile phone possession at a younger age, “bad feelings towards school”¹⁰⁾, and “friendlessness”⁹⁾ and that it was among the factors affecting the onset of FSA one year after the baseline¹⁶⁾. According to a survey by the MECSST³⁸⁾, the most common reason for having a mobile phone from the viewpoint of the sixth grade students was advice by parents and starting attending cram schools after regular school hours, and that from the viewpoint of parents it was due to security for the children. This suggests that the wishes of parents play a large role in whether or not students have mobile phones. This also suggest that the influence on the FSA of having mobile phones at a younger age must be examined due to two possible reasons: due to early ownership of mobile phones, and due to the wishes of parents. Further studies are required to elucidate details of the child mobile phone use and ownership.

Previous studies have reported significant correlations between unsupportive parenting attitudes and “bad feelings towards school”⁹⁾ and all subscales of FSA¹⁰⁾, and that they were among the factors affecting the onset of FSA as expressed in the subscales (“bad feelings towards school” and “aversion to attending school”) one year after the baseline¹⁶⁾. This study suggests that unsupportive parenting attitudes were significant predictors of the “friendlessness” as well as of the “bad feelings towards school”. The successful development of skills and functions such as social adaptation and acquisition of life goals require supportive attitudes of the parents³⁹⁾. Put differently, it can be inferred that supportive parental attitudes and family functions play an important role

in high school student adaptation to school. Teachers need to support and encourage parents to understand the importance of parenting attitudes and family functions by providing information and opportunities for parents to learn through interaction with other parents such as at Parent-Teacher Association and parent meetings, as well as opportunities for parents to consult freely.

The present study suggests that perceptions of maladjustment in learning settings and poorer understanding in the school learning in the 10th grade were significant predictors for the “bad feelings towards school”. The previous studies have reported significant correlations between strong perceptions of the own maladjustment in learning settings and two FSA subscale scores (“bad feelings towards school” and “aversion to attending school”)¹⁰⁾ and that perceptions of maladjustment in learning settings and poorer understanding in the school learning were factors in the onset of FSA one year after the baseline¹⁶⁾. According to a survey conducted by Yamashita and Kiyohara⁵⁾ for high school students, it was reported that “I do not want to study” was the second most important reason and “I do not understand the study” was the third most important reason behind the FSA score. This suggests that if students perceive maladjustment in learning settings and poorer understanding in the school learning just after entering high school, they may develop bad feelings towards school and teachers, resulting in the onset of FSA. From early in 10th grade, it is necessary to give guidance to encourage continuing interest in learning and to listen to students to identify perceptions of maladjustment and anxiety in learning settings.

3. Limitations of the study

This study requested all full-time public senior high schools in Nagano Prefecture to cooperate in the research, but received cooperation from less than half of the schools. In the longitudinal data collection, due to the withdrawal from schools, school refusal, and attendance at the school health room, it was difficult to obtain valid combined data sets. Because there are few previous studies measuring and analyzing FSA as a concept, and no cut-off point has been established, the onset of FSA was defined as the value calculated at the 75th percentile of each subscale score in the baseline. These are limitations of this study to be addressed in the future. In further studies we will identify the relationship between variables, and accumulate further studies to gain knowledge on more specific support methods.

V. Conclusions

The means for all subscale scores of FSA of 10th grade students was the lowest. The significant predictors of the FSA were the anthropophobic tendency, perceptions of maladjustment in learning settings, experience of mental health problems that needed mental assistance, unsupportive parenting attitudes, having a mobile phone at a younger age, being male, low self-esteem, poorer understanding in the school learning and experience of being bullied.

It is important for *Yogo* teachers to be knowledgeable of the anthropophobic tendency in detail and experience of mental health problems that needed mental assistance among students early in 10th grade, and make use of such information for support; to provide support that help students acquire skills to build personal relationships and adjust in groups, and foster adequate self-esteem; to provide mind care to deal with the experience of being bullied; to listen to students to identify perceptions of maladjustment and anxiety in learning settings; and to provide the parents with opportunities of learning and consultation.

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Main Works:

- Aruga M: The current state and problems of cooperative support for high school students with suspected mental disorders. *Journal of Japanese Association of Yogo Teacher Education* 20: 53-63, 2016
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Membership in Learned Societies:

- The Japanese Association of School Health
- The Japan Association for School Mental Health
- Japanese Association of Yogo Teacher Education
- Japan Academy of Psychiatric and Mental Health Nursing