

Stress States of School Children in Small-Size Schools on Remote Islands

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Abstract

Objectives Small-size schools on remote islands or in remote areas often have combined classes for several grade levels, and different grade students are taught together in one class. The majority of relationships among students remain unchanged for nine years until junior high school graduation. It was then hypothesized that because of these conditions, stress is more likely to occur at such schools. The aim of this study was to confirm this hypothesis.

Methods To investigate the stress states and lifestyle conditions, we conducted questionnaire surveys with 143 pupils and 86 students at small-size elementary and junior high schools on a remote island for comparison with students at such schools in remote and suburban areas on the main island of Japan.

Results Elementary school students at the school on the remote island showed fewer stress symptoms. There were fewer stress factors, and well-developed support structures were provided in them. There were only few students enrolling in cram schools and private lessons. Many students had regular hours for sleep and ate a proper breakfast. Junior high school students at the school on the remote island showed study-related stress in spite of well-developed support structures.

Conclusion These results on the elementary school students did not support our hypothesis that students at small-size schools on the remote island have high stress. However, studying condition became a cause of stress for junior high school students.

Key Words remote island, small-size school, school children, mental health, symptom

Introduction

We have conducted surveys on the stress¹⁾, health management and education²⁻³⁾ at schools operated by the Japanese government for school-aged children of Japanese nationals living abroad with family on temporary diplomatic, business or education missions (Japanese schools). A survey of stress conditions among students at a small-size Japanese school in Malaysia⁴⁾ showed higher levels of stress than those at large Japanese schools in China⁵⁾, Thailand⁶⁾ or Taiwan⁷⁾.

It was assumed that the results were attributed to class grouping and relationship among students. Small-size schools often have only 1 class for each grade level or even combined classes for several grade levels, and this may cause study-related stress since different grade students are taught together in one class. The majority of relationships among students remain unchanged for nine years until junior high school graduation, and this may cause relationship-related stress. These conditions at small-size school are same in Japan. We have then hypothesized that stress is more likely to occur at small-size schools and that the stress is higher at

ones on a remote island than at ones in a remote area on the main island because of geographical isolation.

To confirm this hypothesis, we conducted questionnaire surveys targeting students at small-size elementary and junior high schools on a remote island for comparison with students at schools in remote and suburban areas on the main island of Japan.

Subjects and Methods

In this study, we carried out questionnaire surveys in elementary and junior high schools at three different locations; a remote island, a remote area and a suburban area.

The remote island targeted in this study was an island in Okinawa Prefecture with a population of approximately 55,000. The major industries comprise tourism and primary industries centering on cattle ranching, seaweeds and prawn farming. The geographical isolation of remote islands leads to limit the range of interaction among school-aged children because of the decreased children due to low birthrate and the increased elderly people in the population.

Remote island (RI) schools were elementary school A, junior high school B and C (Table 1).

The remote area was a mountainous region in the northern section of Osaka Prefecture. Many people in this area had been engaged in forestry and small-scale farming. However, due to rapidly changing demographics, major roads were established and large-size new residential areas were planned for the revitalization of the area. The remote area (RA) school surveyed was the small-size combined elementary and junior high school D (Table 1).

The suburban area for the comparison was a secluded residential area in Wakayama Prefecture. The financial condition in this area recently became weak by suburbanization, and the population decreased due to effective transport to the Osaka metropolitan area. Elementary school E and junior high school F were selected for this study.

Table 1 Number of subjects, by school, and response rate

a) Elementary School

Area	School	Grade	Boy			Girl		
			No. of Students	No. of Response	Response Rate (%)	No. of Students	No of Response	Response Rate (%)
RI	A	3-6	68	65	95.6	80	78	97.5
RA	D	3-6	15	13	86.7	14	14	100
CS	E	5&6	159	153	96.2	171	160	93.6

b) Junior High School

Area	School	Grade	Boy			Girl		
			No. of Students	No. of Response	Response Rate (%)	No. of Students	No of Response	Response Rate (%)
RI	B	1-3	29	21	72.4	31	30	96.8
	C	1-3	21	17	81.0	19	18	94.7
RA	D	1-3	14	13	92.9	23	10	43.5
CS	F	2&3	242	232	95.9	252	201	79.8

RI : Remote Island School RA : Remote Area School CS : Comparison School

In this study, we employed two questionnaire sheets. One was the mental health check list for students (check list)⁸⁾ and the other was lifestyle condition survey sheet. The questionnaire sheets were delivered to students by classroom teachers. Students were directed to complete them at home and return them to their teachers.

In the check list, students were asked about physical symptoms, depression/ anxiety, bad temper/ anger, and lethargy as “stress symptoms”, relationships with teachers and friends, and study as “stress factors” and support from fathers, mothers, classroom teachers, and friends as “support structures”.

Higher scores for stress symptoms and factors represent larger stress symptoms and factors. Higher support structure scores represent better support structures.

In the lifestyle condition sheets, the subjects were asked about activity time, lifestyle habits and health conditions. We classified time on cram school & private lessons, conversation, study, TV, games, and helping family into “activity time”; bed- and wake-up time and circumstances, and number of breakfast in a week into “lifestyle habits”; and physical and mental conditions into “health conditions.”

Statistical analyses were performed using the SPSS statistical package ver18.0 (SPSS Japan). Kruskal Wallis test and Mann-Whitney U test were used to compare the median values of each category in the check list. Chi square test was performed for cross-table comparison. The level of significance was set at 5%.

This study was conducted in 2009 according to the epidemiological research guidelines of the Japanese Ministry of Health, Labor and Welfare and the Japanese Ministry of Education, Culture, Sports, Science and Technology. The survey was anonymous. The submission of the survey sheet was regarded as the consent to participation in this study.

Results

The number of subject students and response rates are shown in Table 1. The response rates were more than 70% except girls at School D. The total number of the subjects at RI schools was 143 pupils and 86 students.

Mental Health

The median values of each category in the check list are shown in Table 2. As for elementary school students (Table 2a), physical symptom scores in boys at RI school were significantly lower compared with those at RA school and comparison school. Scores for bad temper/ anger and lethargy were significantly lower in boys at RI school than at comparison school. No significant differences were obtained in scores for relationships with teachers and friends, and study. Regarding support structures, scores for support from friends at RI school were significantly higher than ones at RA school.

In girls at RI school, physical symptom scores were significantly lower than ones at comparison school. No differences were obtained in scores for depression/ anxiety, bad temper/ anger, and lethargy. Stress factor scores revealed no significant differences. Support structure scores were significantly lower for support from classroom teachers than ones at RA school.

In regard to junior high school students (Table 2b), physical symptom scores in boys at RI schools were significantly higher than ones at RA schools. Scores for depression/ anxiety, bad temper/ anger, and lethargy showed no significant differences. Scores for study as a stress factor were significantly higher than ones at RA schools. Scores for relationships with teachers and friends revealed no significant differences. Regarding support structures, scores for support from classroom teachers were significantly higher than ones at

comparison school.

Physical symptom scores in girls at RI schools showed no significant difference to the other areas. Scores for relationships with teachers were significantly higher than ones at comparison school. Scores for study were higher than ones at RA school. Regarding support structures, scores for support from teachers were significantly higher than ones at comparison school.

Table 2 Comparison of items in the checklist by school

a) Elementary School Students

		Boy				Girl				
		RI	RA	CS	P	RI	RA	CS	P	
Stress Symptoms	Physical Symptoms	4	6	6	*	RI/RA* RI/CS**	5	4	6	* RI/CS*
	Depression/ Anxiety	3	4	4			4	3.5	5	
	Bad Temper/ Anger	4	6	5	*	RI/CS**	5	5.5	5	
	Lethargy	4	4	5	*	RI/CS**	4.5	4	5	
Stress Factors	Relationship with Teachers	3	3				3	3		
	Relationship with Friends	4	5				4	4.5		
	Study	5	6				5	5		
Support Structure	Father	9	9				8	9.5		
	Mother	11	11				10.5	11		
	Classroom Teacher	9	9				8	11		##
	Friends	8	5		##		9	10		

b) Junior High School Students

		Boy				Girl				
		RI	RA	CS	P	RI	RA	CS	P	
Stress Symptoms	Physical Symptoms	3	0.5	2	*	RI/RA** RI/CS**	3	2	3	
	Depression/ Anxiety	1	0	0			0.5	2	1	
	Bad Temper/ Anger	1	0	1			1	1	2	
	Lethargy	3	1	3			4	2	3	
Stress Factors	Relationship with Teachers	0	0	0			1.5	0.5	0	** RI/CS**
	Relationship with Friends	1	0	1			0.5	0	0	
	Study	3.5	0.5	4	*	RI/RA* RA/CS*	6	3	4	* RI/RA** RA/CS*
Support Structure	Father	10.5	9	10			9.5	6.5	9	
	Mother	12	11	11			12	11	12	
	Classroom Teacher	12	9.5	9	**	RI/CS** RA/CS*	12	9	8	* RI/CS**
	Friends	10.5	11	12			14	12.5	14	

Values are medians.

RI : Remote Island School RA : Remote Area School CS : Comparison School

**p < 0.01 *p < 0.05 (Kruskal Wallis) ##p < 0.01 (Mann-Whitney U)

Lifestyle Condition

In a comparison of activity time for elementary school students (Tables 3), boys at RI school who reported enrollment in cram schools and private lessons accounted for 59%. This rate was significantly lower than ones at comparison school. The rate of conversation for one hour or more (57%) was significantly lower at RI school than ones at RA school. The rate of studying for one hour or less (89%) was significantly higher at RI school than one at comparison school. The rate of watching TV for one hour or less (48%) was significantly higher at RI school than one at comparison school. The rate of playing games for one hour or less (95%) was significantly higher at RI school than one at comparison school.

Girls at RI school who reported enrollment in cram schools and private lessons accounted for 71%. This rate was significantly lower than one at comparison school. The rate of having conversation for one hour or more (60%) was low, but no significant difference was noted. The rate of studying for one hour or less (90%) was significantly higher than one at comparison school. The rate of helping families (23%) was significantly lower than one at comparison school.

In regard to lifestyle habits (Tables 3), all boys at RI school reported going to bed before midnight. This rate was a significantly higher than one at comparison school. However, students who reported falling asleep immediately accounted for only 27%. The rate of waking up before seven o'clock (78%) and the rate of waking up comfortably (49%) were significantly higher than ones at comparison school. The rate of eating breakfast every day (80%) was high, but no significant differences were noted.

Most of the girls at RI school reported going to bed before midnight, but the rate of falling asleep immediately accounted for only 17%. The rate of waking up before seven o'clock accounted for 77%, but those who reported waking up by themselves accounted for only 19%, which was significantly lower than at comparison schools. The rate of eating breakfast every day (86%) was high, but no significant differences were noted.

In regard to health conditions (Tables 3), boys at RI school who reported liking school accounted for 72%. This rate was significantly higher than one at comparison school. The rate of being healthy (70%) was high, but no significant differences were noted. The rate of having something to be proud of (26%) was significantly lower than one at RA school.

Girls at RI school who reported liking school accounted for 76%. This rate was significantly higher than one at comparison school. The rate of having something to be involved in (45%) was significantly lower than one at comparison school.

Next, in regard to activity time of junior high school students (Tables 4), boys at RI schools who reported enrollment in cram schools and private lessons accounted for 11%. This rate was significantly lower than one at RA school and comparison school.

In girls at RI schools, those who reported going to cram schools and private lessons accounted for 34%. This rate was significantly lower than one at RA school and comparison school. The rate of watching TV for one hour or less (48%) was significantly higher than one at comparison school.

In regard to lifestyle habits (Tables 4), boys at RI schools who reported going to bed before midnight accounted for 95%. This rate was significantly higher than one at comparison school. The rate of waking up before seven o'clock (74%) was significantly higher than one at RA school and comparison school.

Girls at RI schools who reported going to bed before midnight accounted for 89%, those who reported waking up before seven o'clock accounted for 77%, and those who reported eating breakfast every day accounted for 88%, all of which were significantly higher than one at comparison school.

Table 3 Comparison of lifestyle condition of elementary school students by school

		Boy				Girl					
		RI	RA	CS	P	RI	RA	CS	P		
Activity time	Cram School & Private Lessons	59	77	88	**	RI/CS**	71	86	91	**	RI/CS**
	Conversation (1 hour or more)	57	92		*	RI/RA*	60	86			
	Study (1 hour or less)	89	69	76	*	RI/CS**	90	100	59	**	RI/CS** RA/CS**
	TV (1 hour or less)	48	54	22	**	RI/CS** RA/CS**	39	43	41		
	Games (1 hour or less)	95	54	60	**	RI/CS**	88	93	84		
	Helping Family	23	33	32			23	29	42	**	RI/CS**
Lifestyle habits	Go to bed before midnight	100	100	89	**	RI/CS**	99	100	94		
	Fall asleep immediately	27	31	18			17	21	16		
	Wake up before 7 o'clock	78	92	48	**	RI/CS** RA/CS**	77	100	66	**	RI/RA** RA/CS**
	Wake up by himself/herself	40	38	35			19	29	38	**	RI/CS**
	Wake up comfortably	49	62	26	**	RI/CS** RA/CS**	33	36	31		
	Eat breakfast every day	80	62	73			86	92	79		
Health conditions	Like school	72	46	49	**	RI/CS**	76	64	53	**	RI/CS**
	Healthy	70	46	56			53	50	43		
	Take care of health	31	38	37			35	8	48	**	RA/CS**
	Have something to be involved in	59	62	72			45	71	67	**	RI/CS**
	Have something to be proud of	26	83		**	RI/RA**	26	50			

Values are ratios to yes.

RI : Remote Island School RA : Remote Area School CS : Comparison School

**p < 0.01 *p < 0.05 (Chi square)

In regard to health conditions (Tables 4), boys at RI schools did not show any significant differences in any items in any groups.

Girls at RI schools who reported taking care of their health accounted for 17%. This rate was significantly lower than one at comparison school.

Discussion

Most available studies on the relation between health condition and lifestyle have targeted students living in urban or surrounding areas. However, there are few studies investigating the relationships of living conditions with mental health among students on remote islands⁹⁻¹². The earlier studies pointed out differences in the health and lifestyles between elementary and junior high school students, and differences between students in villages on remote islands and ones in urban areas¹³⁻¹⁴.

In the elementary school students, stress symptoms were fewer in boys at RI school. There are few students enrolled in cram schools and private lessons at RI school, and more students spend less time for studying, watching TV and playing games. More students wake up comfortably before seven o'clock, and

Table 4 Comparison of lifestyle condition of junior high school students by school

		Boy				Girl					
		RI	RA	CS	P	RI	RA	CS	P		
Activity time	Cram School & Private Lessons	11	54	84	**	RI/RA** RI/CS** RA/CS**	34	90	83	**	RI/RA** RI/CS**
	Conversation (1 hour or more)	58	77				68	80			
	Study (1 hour or less)	79	62	72			77	70	64		
	TV (1 hour or less)	37	31	29			48	40	31	*	RI/CS**
	Games (1 hour or less)	73	62	63			96	90	86		
	Helping Family	19	15	16			25	10	25		
Lifestyle habits	Go to bed before midnight	95	92	57	**	RI/CS** RA/CS**	89	67	52	**	RI/CS**
	Fall asleep immediately	26	15	21			17	20	21		
	Wake up before 7 o'clock	74	38	42	**	RI/RA* RI/CS**	77	50	41	**	RI/CS**
	Wake up by himself/herself	37	31	37			42	30	36		
	Wake up comfortably	32	15	24			19	20	12		
	Eat breakfast every day	95	54	65	**	RI/RA** RI/CS**	87	80	65	**	RI/CS**
Health conditions	Like school	57	45	64			56	70	54		
	Healthy	39	38	33			21	50	27		
	Take care of health	24	31	35			17	20	34	*	RI/CS*
	Have something to be involved in	42	54	48			57	60	53		
	Have something to be proud of	26	38				17	20			

Values are ratios to yes.

RI : Remote Island School RA : Remote Area School CS : Comparison School

**p < 0.01 *p < 0.05 (Chi square)

there are also more students who like the school. It is considered that these are not the characteristics of students at RI school, because there are no differences with students at RA school. However, in addition to this, the students at RI school have more favorable relationships with other students. This may reduce stress symptoms to a greater degree than for other students.

Girls at RI school showed fewer physical symptoms. There are few students enrolled in cram schools and private lessons, and more students spend less time for studying. More students like school than the students at comparison schools. Although these cannot be considered characteristics of students at RI schools, this may reduce stress symptoms to a greater degree even if the support structures were not well developed.

In junior high school students, boys at RI schools have favorable relationships with their classroom teachers. However, they reported more physical symptoms due to the stress of study. More students go to bed before midnight and wake up before seven o'clock, eat breakfast every day, and have an orderly life. However, fewer students are enrolled in cram schools and private lessons. This may cause more study stress than for the students at RI schools.

In girls, no differences in the stress symptoms were noted. More students at RI schools watch fewer hours of TV. They also go to bed before midnight, wake up before seven o'clock, eat breakfast every day, and have orderly lives. However, fewer students at RI schools are enrolled in cram schools and private lessons. This may cause more study stress although the support structures are well developed.

Migitaka reported that "being unable to understand the content of classes" becomes a stress factor for junior high school students, which is different from elementary school students¹⁵⁾. Among the elementary school students at RI school, fewer students enrolled in cram schools and private lessons, and study for fewer hours. This may explain the lower rate of stress symptoms. Meanwhile, among junior high school students at RI schools, fewer students enrolled in cram school and private lessons, and study for fewer hours. This may account for their higher study stress, including stress related to going on to high school.

Junior high school students at overseas Japanese schools also have stress on going on to study at local high schools or being away from parents if they return to Japan to attend school¹⁾. Shimada et al¹⁶⁾ reported that academic stressors can trigger stress responses in students. Since these cannot be completely eliminated, it is important to consider ways to deal with and overcome them. Thus, it is necessary to increase the support from teachers and counselors, and to teach students stress coping skills more effectively.

We presumed that in small-size schools the relationships with friends and teachers remained the same for nine years and that this may lead to some stress associated with study or relationships with friends and teachers. Elementary school students on remote islands showed fewer stress factors, and had well-developed support structures, which did not support our hypothesis that students at small-size schools have high stress. However, it is suggested that studying condition becomes a cause of stress for junior high school students.

Subjects in this study were students on remote islands and they were able to attend school while living at home. However, after graduating from high school, most have to relocate to the main island of Okinawa, or other areas such as Tokyo or Osaka. Furthermore, after graduating from junior high school, these students have to enter larger groups of students coming from feeder schools. Thus, such students need to become independent during elementary and junior high school to adjust to this situation. Considering special stressors, such as attending university away from the islands or starting work, it is important for such students to effectively manage their stress and to create an environment that allows them to release study-related stress.

This survey is a comparison of small-size schools in the rural area in Osaka and the suburban area in Wakayama. The differences in their environments may influence the results of the study. In order to confirm our results, it is necessary to compare with elementary and junior high school students in urban areas of Okinawa.

Conclusion

We conducted a questionnaire survey among students at elementary and junior high schools on remote islands to investigate their stress states and lifestyle conditions. As a result, elementary school students showed fewer stress symptoms and this might be associated with fewer stress factors and well-developed support structures in them. In schools on the remote island, there are only few students enrolled in cram schools and private lessons, which allows them to keep regular hours for sleep and eat a proper breakfast. Junior high school students showed study-related stress in spite of well-developed support structures. These results did not support our hypothesis that students at small-size schools have high stress. However, it is suggested that studying condition becomes a cause of stress for junior high school students.

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