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A Study of the Significance of Distress as an Etiological Factor in Psychosomatic Symptoms of High School Students in Okinawa

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ABSTRACT

High school students (N＝902) in Okinawa were asked to participate in a questionnaire survey which was designed to study the factors in psychosomatic symptoms of adolescents. This study focused on mental distress, perceptions of school and home environments, psychosomatic symptoms, and emotional instability. Students with concerns regarding relationships with family, peers, or the opposite sex tended to report more psychosomatic symptoms than students with other distresses. The results indicated that there was a relationship between those students with high distress factor scores and those students finding little pleasure in school and/or home or with emotional instability. Furthermore, there was a significant correlation between distress factors and psychosomatic symptoms in students with little pleasure in school and/or home but there was no significant correlation in students with emotional instability. The findings of this study suggest that distress concerning problems in human relations is an important etiological factor in psychosomatic symptoms of adolescence and that the distress of students with those symptoms is associated with their perception of school and home ; moreover the rating of the seriousness of the distress factor is available to screen those students.

INTRODUCTION

There are a variety of concerns in adolescence which are different from those in other periods such as childhood and adulthood because adolescence is a particularly interesting period of unique "developmental stress" that accompanies rapid physical and psychosocial growth[1]. Those concerns seem to be one of the important psychosocial factors in psychosomatic complaints of adolescents. We reported that distress within family or peer relationships, finding little pleasure in school and/or home, showing emotional instability, or showing a strained parent-child relationship were closely associated with psychosomatic symptoms of adolescents[2]. In this report, which focuses on mental distress, perception of school and home, psycho-

somatic symptoms, and emotional instability, its purpose is to study the significance of distress as an etiological factor in psychosomatic symptoms of adolescents.

METHODS

The subjects in this study were 1,021 randomly selected high school students from three schools in the central districts of Okinawa. There were 447 boys and 574 girls, who ranged in age from 15 to 18 years, and who had the same levels of scholastic achievement and living standards.

The students were asked to fill in the questionnaires which consisted of eight basic items. The basic items and detailed subquestions are as follows :

Q1) Family make-up

Q2) Living conditions

The hour of rising, bedtime, hours of sleep, time spent watching television, sports, having breakfast, school records, etc.

Q3) Ways of relaxation

Listening to music, reading, sports activities, hobbies, sleeping, staying in one's room, etc.

Q4) Perception of school and home

Because the principle environments for high school students are their schools and homes, we felt that their perception concerning both, might reflect in part the stress level from those surroundings. Perception levels were categorized in groups (Table 1). Students were asked to select only one category.

Q5) Type of distress

A variety of concerns pertaining to study, human relation problems, anxiety concerning sexual matters, personality, appearance, etc. and "no distress" were listed (Table 2). Students were asked to select less than five distress factors. The distress score was constructed by summation of the rating of each distress factor measured by seriousness (Table 3).

Table 1. Classification of perception group concerning school and home.

Group S :	find little pleasure in school.
F :	find little pleasure in home.
B :	find little pleasure in school and home.
n :	find some pleasure in school and home.
HS :	find a lot of pleasure in school.
HF :	find a lot of pleasure in home.
HB :	find a lot of pleasure in school and home.

Table 2. Type of distress.

1. Study and school record.
2. Decision about study after graduation and college or university entrance examination.
3. Family relationship (conflict between parents, conflict with parents, or troubled family member).
4. Peer relationship (having no friends, or conflict with friend).
5. Relationship with the opposite sex.
6. Anxiety concerning sexual matters.
7. Conflict with teacher.
8. Club activity.
9. Personality.
10. Appearance.
11. Pocket money.
12. Other stressors.
13. No distress.

Table 3. The rating of the distress (Distress score).

3 point :	Relationship with family.
	Relationship with peer.
	Relationship with the opposite sex.
2 point :	Personality.
	Conflict with teacher.
	Anxiety concerning sexual matters.
1 point :	Study.
	Decision about study after graduation.
	Appearance.
	Club activity.
	Other stressors.
0 point :	Pocket money.
	No distress.

Q6) Psychosomatic symptoms by type

A wide spectrum of symptoms were listed (Table 4). The respondents were given the following choice for answering the question, "Have any of those symptoms bothered you, and if so, how often during the past one year?" The symptom score was constructed by summation of the following rating for separate items : 0 = never or few, 1 = sometimes, 2 = often or continuously. The internal reliability of the score was 0.87 as measured by Cronbach's alpha coefficient.

Q7) Emotional instability

The Japanese Edition Cornell Medical Index-Health Questionnaire (JCMI) was originally designed to screen patients for neurosis but was often used in clinical practice as a screening procedure to evaluate neurotic tendencies[3]. JCMI has also been used frequently and widely to screen for emotional instability in mass populations such as junior and high school students, university students, and workers.[3),4)] Fukamachi[5] defined the various regions of the test as follows : region Ⅰ is considered to be normal, region Ⅱ is considered to be provisionally normal, region Ⅲ is considered to be provisionally neurotic, and region Ⅳ is considered to be neurotic. Mori and Togawa[6] reported that from the factor analysis of JCMI, the first factor which was related to items used to discriminate neurosis was designated emotional instability. We thereby concluded that students who were included in regions Ⅲ and Ⅳ were emotionally unstable.

Procedure and statistical analysis

We asked the students to complete a questionnaire in their class rooms in April and May, 1986, under their teacher's supervision. No names were written on the questionnaire which was self-administered. We recovered all questionnaires but excluded 90 students (40 boys and 50 girls) who had only one parent and 29 students who had given inadequate or frivolous answers to questions. We had data for 902 students, 388 boys and 514 girls, which we analyzed statistically.

For statistical evaluation the chi-square test and t-test were used. In all analyses, differences were considered significant if the significant level was <0.05.

RESULTS

The frequency of the groups according to perception levels of school and home is presented in Table 5. There were no differences by sex in groups S, F, B, HF, and HB. Group HB had the highest percentage, whereas group F and B had the lowest, and group S, n, and HS had intermediate frequencies.

Psychosomatic symptoms by type, the frequencies of which were calculated by the method reported in our previous paper[7], are presented in Table 6. The psychosomatic symptoms reported significantly more often by girls

Table 4. Psychosomatic symptoms by type.

A) Upper digestive symptoms: abdominal pain, nausea, vomiting, anorexia, belching, heartburn, heavy stomach.
B) Lower digestive symptoms: diarrhea, constipation, alternating diarrhea and constipation.
C) Upper respiratory symptoms: nasal discharge, frequent sneezing.
D) Lower respiratory symptoms: difficulty in breathing, wheezing, frequent cough, feeling a lump in the throat.
E) Cardiovascular symptoms: vertigo, light headedness on standing up, feeling dizzy, fainting when in standing position, palpitation, dyspnea after mild exercise, lethargic in the morning.
F) Nervous symptoms: headache, sweating without exercise, syncope, convulsion, tremor of the limbs, numbness of the limb, eyestrain.
G) Mental symptoms: feeling unwell, quick tempered, tears without sorrow, thumb-sucking, nail biting, and fingering eyes.
H) Skin symptoms: red rash on the skin with itching, hives.
I) Urinary symptoms: pollakiuria, polyuria.
J) Others: having too many likes and dislikes in what you eat, overeating, red or white spots with pain in the mouth, unexplained fever, limb or joint pain.

Table 5. Frequency of group according to perception of school and home.

Group	Male(n=388)		Female(n=514)	
	N	%	N	%
S	68	17.5	105	20.4
F	13	3.4	27	5.3
B	17	4.4	24	4.7
n	79	20.4	77	15.0
HS	39	10.1	31	6.0
HF	63	16.2	102	19.8
HB	109	28.1	148	28.8

Groups S, F, B, n, HS, HF and HB are the same as those in Table 1.

than boys were upper digestive, lower digestive, cardiovascular, nervous and mental symptoms ($p < 0.01$). Those symptoms selected most commonly by all students were upper digestive symptoms, cardiovascular symptoms, which are equal to orthostatic dysregulation (OD), and those selected less commonly were nervous symptoms.

Psychosomatic scores for the main distress factors are presented in Table 7. Students with human relation problems such as distress in relationships with family, peer or the opposite sex

Table 6. Frequency by type of main psychosomatic symptoms.

	Male(%)	Female(%)
1. Upper digestive symptoms	20.9	28.2
2. Lower digestive symptoms	11.2	18.0
3. Lower respiratory symptoms	10.8	11.4
4. Cardiovascular symptoms(OD)	18.0	25.2
5. Nervous symptoms	14.3	21.3
6. Mental symptoms	11.0	16.9
7. Urinary symptoms	12.8	15.6

OD: Orthostatic dysregulation.

Table 7. Psychosomatic symptom score for distress factor.

Distress	N	Score Mean ± S.D.	
R. with family	85	12.68 ± 9.26	
R. with peer	69	12.80 ± 8.70	
R. with the opposite sex	90	12.36 ± 8.24	
Personality	238	10.89 ± 7.80	
Appearance	174	10.95 ± 7.20	*
Club activity	103	9.54 ± 7.20	
Study	475	9.03 ± 7.20	
Decision about study after graduation	494	9.05 ± 7.37	
No distress	243	6.60 ± 5.63	

R. : Relationship.

* : $p<0.02$

reported more psychosomatic symptoms than students with other concerns. Especially significant was the difference in distress related to club activities and study, or for those who reported no distress ($p<0.02$).

Distress scores for perception groups and JCMI regions were presented in Table 8 and 9, respectively. Girls of all groups had higher distress score than boys. Groups B, F, and S among boys and girls tended to have higher scores than other groups ; especially significant was group B and F ($p<0.05$ and 0.01). There was no significant difference according to sex in regions Ⅱ and Ⅲ&Ⅳ. Boys and girls in region Ⅲ & Ⅳ had higher scores than those in regions Ⅰ and Ⅱ ($p<0.01$).

Table 8. Distress score for perception group.

Group	N	Score (Mean ± S.D.) Male	Female
S	173	2.90 ± 3.00	3.31 ± 3.00
F	40	3.00 ± 2.96	5.52 ± 3.40
B	41	4.06 ± 3.32	5.21 ± 3.35
n	156	2.75 ± 2.81	3.01 ± 2.68
HS	70	2.85 ± 3.11	3.32 ± 2.82
HF	165	2.48 ± 2.70	2.53 ± 2.33
HB	257	2.16 ± 2.45	2.39 ± 2.45

Groups S, F, B, n, HS, HF and HB are the same as those in Table 1.
*:p<0.05 **:p<0.01

Table 9. Distress score for JCMI region.

Region	N	Score (Mean ± S.D.) Male	Female
Ⅰ	539	1.86 ± 2.32	2.31 ± 2.36
Ⅱ	263	3.05 ± 2.84	3.75 ± 3.02
Ⅲ&Ⅳ	100	5.43 ± 3.00	5.41 ± 3.09

JCMI : Japanese Edition Cornell Medical Index Health Questionnaire.[3]
**:p<0.01

The correlations between distress scores and psychosomatic scores among groups F & B, S, and region Ⅲ & Ⅳ are presented in Table 10. The correlations, especially in region Ⅲ & Ⅳ were low, but in groups F & B and S the correlations were significant ($p < 0.005$ and 0.001, respectively).

Table 10. Correlation between distress scores and psychosomatic scores.

Group	r	P
S (n=173)	0.30	<0.001
F&B (n=81)	0.31	<0.005
JCMI region		
Ⅲ & Ⅳ (n=100)	0.11	N.S.

N. S. : not significant.

DISCUSSION

Adolescents have a variety of problems, which are roughly classfied into mental, somatic, and behaviour categories[8]. For example, the mental category includes emotional lability, change of personality, and psychoses ; the somatic category includes hypochondriasis and physical conditions affected by psychological factors (psychosomatic disorder). The behavior category includes school refusal, deterioration of daily living, and antisocial behavior. Concerns in adolescence appear to be closely associated with these problems, because high school students experience a great variety of concerns regarding study, decision about study or position after graduation, entrance examination, life goals, relationships with family, friends and teachers, identity formation, human life, thought, personality, body, sexual matters, etc.[9),10)] Since distress differs from individual to individual in kind and severity, when we study distress, we need to weigh the seriousness. In this research, we rated high scores to human relation problems such as concerns in relationships with family, peers and the opposite sex, in spite of their low frequencies, because those concerns are specific to adolescents themselves and are thought to be an important factor in psychosomatic symptoms of adolescents[2)]. Meanwhile we rated low scores to concerns pertaining to study and decisions about study after graduation, appearance etc. because of their commonness and rated intermediate scores to distress in personality and conflicts with teachers etc. because of their relative seriousness.

In relationship to distress scores and the perception group of school and home, or regions of JCMI, students with little pleasure in school and/or home (group S, F, and B), or those with emotional instability (region Ⅲ & Ⅳ) are likely to have high scores of distress. There are significant correlations between distress scores and psychosomatic scores in groups B & F, and S, where there is no correlation in region Ⅲ & Ⅳ. This suggests that the perception level concerning school and home environments has a stronger influence on the onset of psychosomatic symptoms through a distress factor than does emotional instability, which may have an influence through mental states such as anxiety, hypochondriasis or depression.

In conclusion, high school students who are bothered by human relation problems (concerns regarding relationships with family, peers, and the opposite sex) tend to have many psychosomatic symptoms. The seriousness of the distress which is experienced by students with little pleasure in school and/or home is correlated with the severity of psychosomatic manifestations. The findings of this investigation suggest that distress is an important etiological factor in psychosomatic symptoms of adolescence and that the concerns of students with those symptoms are associated with their perception of

school and home; moreover it appears that the rating of distress according to seriousness is an available factor for screening adolescents with those symptoms.

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