FACTOR STRUCTURE OF PERCEIVED STRESS FROM DAILY EVENTS AND ITS RELATION TO PERCEIVED SYMPTOMS AMONG NINTH GRADERS IN TAIPEI CITY, TAIWAN

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This study employs a cross-sectional design to analyze the principal components of perceived stress from daily events and to examine whether certain factors are associated with the perceived psychosomatic symptoms in the ninth graders. Data were available on 469 students of a selected junior high school in Taipei City. According to the result of principal components analysis, three factors including poor parent-child relationship, concerning prospects, and study problems were defined for the perceived stress from daily events. A student's neurotic trait, poor parent-child relationship, and concerning prospects were selected as important predictors of perceived symptoms. School is suggested as a setting for delivering the parent-child education for stress coping. (J Natl Public Health Assoc (ROC): 1993; 12(3): 211-218)

Key words: stress, symptom, personal trait, social support

INTRODUTION

The impact of stress on health has drawn a considerable attention in recent years. Many researches have expanded upon Cannon [1] and Selye's [2] identification and description of the stress response. The model proposed by Wilder and Plutchik [3] summarizes multiple possible outcomes of the stress system response, including a return to prior status; an increased ability of the individual to adapt to the stressor in the future; a physiological dysfunction; an emotional disturbance; an increased predisposition to illness; or the development of a psychosomatic and/or other physical illness.

The assumption that stress can affect physical and mental processes in ways that might alter an individual's susceptibility to disease has been proven in numerous studies [4-7]. Disease has been conceptualized as an expression of "break-down" in the wake of a prolonged failure to restore the emotional homeostasis which has been disturbed due to insufficient coping with the demands of life [9,10]. Some daily events as well as adverse life events can produce ill sign and symptoms because they may bring new, intensive, rapid, sudden, or unexpected change to a person's life. How well people can contain or limit the impact of such signs and symptoms is the key to good health.

Adolescence is a period of growth between childhood and maturity. The developing child is faced with physical, cognitive, social and psychosexual changes. These developments in different dimensions are closely interwoven. Therefore, the major developmental tasks make adolescence different from adulthood. The

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stress that goes with this phase of development has been found to be associated with physical and psychological symptoms in adolescence [7,8]. The developmental pressures and developmental tasks may cause adolescents being vulnerable to life stresses.

Among the few studies that have addressed the issue of adolescents' health is a study of 2127 senior high students by Chang [11]. The impact of test anxiety upon the health of adolescents was reported. More intensive investigation for exploring additional influential factors on adolescents was also suggested.

Stress can exist when an individual is unable to respond adequately to an environmental demand. A study of life events [12] has significantly confirmed that psychosocial factors play an important etiological role in depression. Family as a basic unit of social systems is an important environment for its members' health. However, little has been done on how family affects one's health.

The present study focuses subjects on the ninth graders who are facing a common stress of entrance examination. The purpose of this study was to investigate associations between perceived stress and perceived symptoms. The questions of the study were: (1) what is the factor structure of perceived stress from daily events in the ninth graders? (2) how the personal traits and social supports correlate with perceived stress? (3) how the personal traits, social supports and perceived stress correlate with perceived symptoms?

MATERIALS AND METHODS

Sample

All of the ninth graders in a junior high school in the Taipei City Chung-Shan School District were studied, providing a sample of 469. These students were invited to participate in a 3-year program [13] since 1987 when they were seventh graders. The program was designed to conduct health risk appraisal and health intervention for the purposes of disease prevention and health promotion. The subjects included 48.0% boys and 52.0% girls. Social-economic status of the families of subjects was classified into high level (5.3%), middle level (59.5%) and low level (35.2%).

Measures

To assess student's personal traits, perceived stress, perceived supports, and perceived symptoms, a set of questionnaires were constructed. The reliability of these instruments had been verified in a pilot study [14].

Personality measures include 10 "extrovert" items, 10 "neurotic" items, and 8 "self-acceptance" items. The answers of "yes" on the questions of three scales were summed separately to yield what are purported to be scores on "extroversion", "neuroticism", and "self-acceptance". Cronbach's alpha coefficients of these scales are 0.84, 0.76, and 0.81 respectively.

The questionnaire of perceived stress from daily events consists of 50 items (PSDE-50) in 6 sources (growth and development, family adaptation, school adaptation, interpersonal relationship, concerning prospects, and heterosexual interests).

The Cronbach's alpha coefficient of PSDE-50 is 0.94. The ratings of separate items are: O=never, l=sometimes, 2=quite often, often, 3=often or continuously. Perceived stress from major life events consists of 10 items such as parents' divorce, relative's death, having to remain in original class, running away from home, etc.. The students were asked whether they had experienced any events during the past six months. For each of the "ever happened" events, students were further asked to assess their feelings (like or dislike). The score of major life events was calculated by summing the codes (2=strongly dislike, l=dislike) of negative feelings.

The supports from family members, teachers, and friends were measured by statements with 3-point scale. The support scores of these three sources were constructed by summation of the following ratings of separate items: O=do not care, l=being satisfied, 2=being very much satisfied. The Cronbach's alpha coefficient of Social Support Scales is 0.86.

In terms of perceived symptoms measure, a Brief Symptom Rating Scale (BSRS) was employed. It comprises 50 items, which best reflect the original ten symptom dimensions

from the SCL90-R [15]. Each item was self-rated by individuals on a 5-point scale of symptom severity distress. The split-half reliability coefficients of 0.96 to 0.98 for different populations were reported. The test-retest reliability coefficient of 0.91 for the seventh graders was also demonstrated in the same report. A general severity index (GSI) and 6 scores of perceived symptoms were calculated by summing the severity-codes of selections and dividing these summations by the number of items.

Procedure

All of the subjects were asked to fill in the questionnaires in classrooms at the beginning of 1990, which was six months prior to the entrance examination. During class administration, a teacher attended a researcher to the classroom. They circulated around the room answering questions and helping students complete the form.

RESULTS

1. Factor Structure of the PSDE-50

Since few of the subjects reported major life events, only the perceived stress from daily events (PSDE-50) was employed for examining the factor structure. A principal components analysis can be performed for getting simplified but meaningful scores of perceived stress.

It was found that there were twelve factors with eigenvalues larger than 1.0, accounting for 61.53% of the total variance. The largest eigenvalue (Factor 1) was 13.24, the second largest eigenvalue (Factor 2) was 2.90, indicating the first factor dominated the solution. On the one hand, only three of the eigenvalues reached the value of 2. On the other hand, the first three factors were retained on the basis of the scree test. This 3-factor solution was then applied in a further principal axis factor analysis with varimax rotation for interpretation.

Table 1 shows the factorial structure from this analysis with items of significant loadings (>0.5) on each of the factors. All the items retained were found to have high loads only on a single factor. The three factors could be defined as follows: poor parent-child relationship (Factor 1), concerning prospects (Factor 2), and study problems (Factor 3). It is noted that a poor relationship with parents is really a

Table 1. Factorial Stucture of the Perceived Stress from Daily Events (PSDE-50) after Varimax Rotation of the 3-Factor Solution

Factor 1:	20	My Parents don't understand me (.697)
poor	36	I have had a quarrel with my parents (.680)
parent-child	16	Parents strictly enforce discipline on me (.667)
relationship	34	I have been blamed by my parents (.671)
	45	My parents don't like me (.665)
	07	I hope to run away (.612)
Factor 2:	13	I am worrying if my parents' prospects can come true (.787)
concerning	11	Parents have high levels of prospects for me (.593)
prospects	19	I am worrying about the entrance examination (.567)
	35	Lack of patience for study always discourages me (.555)
	44	Competition for advancing to a senior high school is highly stressful to me (.525)
Factor 3:	08	I can't focus my attention on studying (.694)
study	03	I don't think studying is at all interesting (.693)
problems	12	I can't grasp the emphasis of my reading (.635)

Table 2. Stepwise Multiple Regression Analysis of Perceived Stress

Dependent variable	Predictor	REG	SE	STD REG	R square	F
Poor parent-child relationship	Family support	–1.97	0.18	–0.48	0.30	155.52
	Neurotic trait	2.70	0.74	0.16	0.34	18.43
	Extrovert trait	2.97	0.75	0.17	0.36	11.24
Concerning prospects	Neurotic trait	4.17	0.73	0.29	0.14	59.79
	Friend support	–0.78	0.26	–0.15	0.18	18.09
	Self-acceptance	–0.88	0.26	–0.19	0.20	8.20
Study problems	Friend support	–0.86	0.17	–0.27	0.13	53.25
	Self-acceptance	–0.51	0.16	–0.17	0.17	16.44
Major life events	Neurotic trait	1.48	0.50	0.15	0.02	8.68

REG: Regression coefficient
SE: Standard error
STD REG: Standardized regression coefficient

main source of perceived stress among the ninth graders. It is also understandable that concerning prospects and study problems are often associated with the entrance examination.

2. Predictors of Perceived Stress

Stepwise regression analysis was employed. Table 2 displays the results of this analysis combined with the researcher's judgement about the usefulness of a predictor. The analyses were conducted separately for four dimensions of perceived stress. The variables being used as predictors include personal characteristics and sources of support.

Turning first to the results relating to the prediction of "poor parent-child relationship", family support is an important determiner of it, and accounts for about 30% of the variance in it. Neurotic trait is selected to enter at step 2 and accounts for about 4% of the variance, after the contribution of the amount of family support has been taken into account. Extrovert trait enters at step 3, and is shown to account for increment of about 2% of the variance. In sum, lack of family support is the best and most important predictor of "poor parent-child relationship". Neurotic and extrovert traits are the following predictors.

For the variable of concerning prospects, neurotic trait is the most important predictor of it, and accounts for 14% of the variance in it. Additionally, friend support and self-acceptance are negatively related to the variable of "concerning prospects". For the variable of "study problems", friend support and self-acceptance are simultaneously negatively associated with it. However, friend support is more important than self-acceptance as a predictor. Although the variable of neurotic trait has been selected as a predictor of "major life events", it accounts for only 2% of the variance in it. It is therefore conceivable that supports from family/friend and personality variables (neurotic trait and self-acceptance) are good predictors of the perceived stress from daily events.

3. Predictors of Perceived Symptoms

Table 3 presents the results of stepwise multiple regression analyses and the researcher's judgement of meaningfulness. Ten

Table 3. Stepwise Multiple Regression Analysis of Perceived Symptoms

Dependent variable	Predictor	REG	SE	STD REG	R square	F
Somatization	Neurotic trait	.92	.51	.30	.14	60.51
	PPCR	.05	.01	.26	.20	26.74
Obsession	Neutrotic trait	.17	.15	.33	.22	100.03
	Concerning prospects	.06	.01	.28	.30	42.68
	Friend support	−.15	.05	−.14	.32	8.76
Sensitivity	Neurotic trait	.84	.17	.24	.20	88.82
	Concerning prospects	.05	.13	.21	.28	42.13
	Self-acceptance	−.21	.06	−.18	.33	26.04
Depression	Neurotic trait	1.11	.16	.31	.27	130.90
	PPCR	.05	.01	.24	.37	59.15
	Self-acceptance	−.18	.05	−.15	.41	21.99
	Concerning prospects	.05	.01	.19	.43	13.95
Anxiety	Neurotic trait	1.10	.15	.34	.25	119.69
	PPCR	.05	.01	.27	.32	35.77
	Self-acceptance	−.13	.05	−.12	.34	9.89
Hostility	PPCR	.07	.01	.30	.21	96.43
	Neurotic trait	.80	.19	.21	.27	28.94
	Concerning prospects	.05	.01	.18	.29	11.79
Phobia	Neurotic trait	.67	.16	.22	.13	52.29
	Concerning prospects	.05	.01	.23	.16	16.17
	Extrovert trait	−.47	.15	−.15	.19	10.26
Paranoid	PPCR	.05	.01	.27	.20	89.59
	Neurotic trait	.90	.15	.27	.30	53.69
	Concerning prospects	.05	.01	.21	.33	16.13
Psychoticism	Neurotic trait	1.04	.16	.31	.20	92.00
	Concerning prospects	.05	.01	.22	.29	42.71
	PPCR	.04	.01	.21	.32	16.53
Additional	Neurotic trait	.87	.15	.29	.19	85.51
	PPCR	.05	.01	.28	.28	46.15
GSI	Neurotic trait	.90	.12	.32	.27	135.40
	PPCR	.04	.01	.24	.38	59.16
	Concerning prospects	.04	.01	.21	.41	20.87

REG: Regression coefficient
SE: Standard error
STD REG: Standardized regression coefficient
PPCR: Poor parent-child relationship
GSI: General severity index

perceived symptoms and general severity index (GSI) were used as dependent variables. The predictors entered for selection include personal variables (gender, neurotic trait, extrovert trait, and self-acceptance), support variables (family, friends, and teachers), and stress variables (poor parent-child relationship, concerning prospects, and study problems).

Neurotic trait, poor parent-child relationship, and concerning prospects are three dominant variables which have been selected as important predictors for these symptoms. Besides, self-acceptance is negatively associated with the symptoms of sensitivity, depression, and anxiety. It was thus noted that a more neurotic student who had a poor relationship with his/her parents and showed much concern about his/her prospects and had lower level of self-acceptance was associated with more serious symptoms.

DISCUSSION

The main dimension of perceived stress from daily events is "poor pareny-child relationship". These aversive situations include: parents don't understand me; I have had a quarrel with my parents; parents strictly enforce discipline on me; I have been blamed by parents; my parents don't like me; and I hope to run away. This finding draws attention to the continuing importance of family relationships in adolescent development. Cummings and Cummings [16] noted that exposure to conflict events might engender appraisals of blame of others, that others are acting unfairly or that others have intention to hurt the individual. These appraisals may lead to the emotion of anger and to aggressive behavior.

The second dimension of stress, named "concerning prospects", consists of the following situations: I am worrying about whether my parents' prospects can come true; my parents have high level of prospects for me; I am worrying about the entrance examination for a senior high school; lack of patience for study always discourages me; competition for advancing to a senior high school is highly stressful to me. All of these statements and the third dimension named "study problems" are evidently correlated with the entrance examination. However, it is believed that the three dimensions of perceived stress from daily events are reciprocal.

The Entrance Examination is a really unique and stressful event among adolescents In Taiwan. Other sources of stress such as family and peer relationships are highly correlated with it. The ninth grade for adolescents is viewed as an important period by students, parents, school teachers, and general people. They show much concern about adolescents' prospects instead of health. Additionally, Chinese parents usually have authority over their child, a mutual communication between them is scarcely seen. Under the pressure of competition, parents have great expectations of their children. On the one hand, when a child could not demonstrate his/her abilities in school works, parent-child relationship would go from bad to worse. On the other hand, a poor parent-child relationship could cause a student's failure at school.

In order to decrease the conflicts between parents and children, parents should be encouraged to set appropriate and realistic expectations for their own children. It is imperative that both parent and child should learn how to communicate with each other. The results indicated that neurotic students who lack parents' and friends' supports are at risk for stressful daily events in general. A counselling program designed and implemented by schools would be an effective way to prevent these problems. An alternative value system, both for the parents and for the children, should be established. Since the rational-emotive therapy is the best known and most wisely practiced, individuals can be trained to recognize their own irrational beliefs and to dispute them actively.

In previous studies [11,13,17,18], the perceived symptoms including somatization, obsession, sensitivity, depression, anxiety, hostility, phobia, paranoid, psychoticism, and additional symptoms have been reported as a serious health problem in students. In this study, an essentially similar conclusion was discussed more in detail elsewhere [19]. It was found that obsession, interpersonal sensitivity, and hosti-

lity were ranked as the first three symptoms among the ninth graders. Moreover, it appears that adolscent girl exhibit such symptoms more frequently than boys.

Further, attempts were made to evaluate several predictor variables, if related to these perceived symptoms. The results indicate that stress from poor parent-child relationship and uncertainty of prospects are important predictors of perceived symptoms except a student's neurotic trait. It is critical to understand the determinants of perceived symptoms, so that these potential influences can be modified from a negative to a positive direction. The data presented here provide partial support for specific relations between certain types of perceived stress and particular symptoms. Although there is limited evidence to support specificity of event-symptomatology relations [20,21], the issue has not been thoroughly investigated. Therefore, further research is needed.

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國三學生日常壓力的因素結構及其與自覺症狀的關係

李　蘭

本研究以橫斷式調查設計，瞭解國中三年級學生自覺的日常壓力事件並分析其因素結構；同時探討與學生自覺症狀相關的因素。台北市某國民中學的469名三年級全體學生接受調查。根據主成份分析的結果，日常壓力事件可界定成三個主要因素，即不良的親子關係、耽心自己的未來、和讀書方面的困難。學生的神經質特質、不良的親子關係、和耽心自己的未來，是預測學生自覺症狀的重要變項。本研究建議以學校為實施親職教育，推動壓力調適的理想場所。(**中華衛誌** 1993；**12**(3)：211-218)

關鍵詞：壓力、症狀、個人特質、社會支持

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