

Investigation of Stress Symptoms among Primary School Children

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ABSTRACT

Introduction: Experience of chronic stress in children plays an important role in enhancing future physical, mental and social problems. It is very essential and vital that families, teachers and professional groups possess necessary abilities to diagnose stress symptoms in children. According to the statistics of Education Ministry, there were almost 5.5 million primary school students in Iran in 2008-2009. However, there are very limited studies about stress in 7 to 12-year-old children. The present study aimed to review stress symptoms in school-aged children. **Methods:** In a descriptive study, 839 third to fifth grade students were selected from five randomly chosen districts of Tabriz using random sampling method in the schools. The data were collected by means of children's stress symptom scale (CSSS) through interviewing by children. Accuracy of translation was checked and content validity and reliability were confirmed using test retest method. **Results:** The entire twenty-six items of the questionnaire were reported as stress symptoms. More than half of the study subjects reported worry, fast heart beating, being afraid, chills and feeling sad as their signs of stress. Headache (46.6%) and tiredness (41.8%) were also reported. In examining every stress symptoms, there was a statistically significant correlation between some symptoms with age, grade and type of school. **Conclusion:** Children showed a wide range of symptoms in facing with stressful events. Accurate identification of symptoms can inform parents, teachers and professional health staff about physical and mental status of school-aged children and result in interventions to reduce their stress.

Introduction

Stress is caused when requirements of a position are more than individual's ability to cope with them.^{1, 2} In fact, stress is a reaction that occurs against stressor agents.³ Response to the stressful events has three components: emotional and physical responses, coping strategies and defense mechanisms.

The first component is physical response that cause some symptoms by arousing autonomic responses,⁴ and is related to stimulation and response in hypothalamic pituitary adrenal axis that ultimately leads to mineralocorticoids and

glucocorticoids secretion from the adrenal gland and prepares body for fight-escape reactions.⁵⁻⁷ Many health care providers and adults believe childhood is the period that human is free from any pressure and problem, children's world is full of games and cheers away from sorrow, sadness and they pass this era without any responsibility.^{1, 8} However, children might also feel mental and emotional pressure due to environmental situations and certain individuals.²

Approximately 35 percent of American children experience stress-related health problems.¹ According to many psychologists, pediatricians and health care providers, expe-

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riencing stress in children plays a major role in increasing physical, mental and social problems.^{1,9} On the other hand, today there are many other issues in families and children's life which are considered as stressors. Nowadays, moving to other places and displacement are much more common that cause school and friend replacement and separating from them. It possibly may not be considered by parents very much. Moreover, the structure of families has changed. Extensive and multi-member families have altered into nuclear families. To make a living, both parents need to work outside in some families and children have to stay home alone long after they return from school.¹ All these changes are growing in developing communities as well as in our community and children are the most vulnerable group affected by these changes. The studies about stress symptom in school-aged children have shown that psychological and physical complaints in the past decade among school-aged children had an upward trend.^{10,11} Nowadays, health educators in schools as well as family counselors are considered as the most important elements of health and must have adequate information on common stress symptoms in children. That is to say that educational role of nurse appears to be more highlighted as a health care provider so that nurse teaches the related issues to school educators and parents or acts as a child's health counselor. Most of the mentioned studies related to childhood stress have been done in other countries and there are very limited studies in Iran on the stress in primary school children. According to statistics of Education Ministry, there were almost 5.5 million primary school students in Iran in 2008-2009. However, there is no accurate estimate of psychiatric¹² and psychosomatic disorders in children. Therefore, conducting a study aiming to review the stress symptoms in elementary school children seems necessary.

Materials and methods

In a descriptive study, all students studying in the third to fifth grade of primary school in

Tabriz were considered as study population. Three people in each grade (9 people from each school), from one male public school, one female public school, a male and a female non-public school were randomly selected that resulted in 180 students enrolled in the pilot study. After calculation of ICC = 0.02 in SPSS software, the effect size was estimated 1.52. The main sample size was estimated approximately 600 students using $ESS = Mk/DE$ formula. In order to prevent from sample loss, this amount was increased 20-25 percent. They could be excluded from the study provided that a student had a known physical and mental disease or his/her age was less than 9 or higher than 12 years or could not understand Persian language. Finally, a sample size of 839 people was collected.

After obtaining permission from the five Education districts, in each school (cluster) and from each grade 10 students (30 students in each cluster) were selected using random sampling method. Thereafter, they were given data collection form of demographics as well as consent form that they took home and their parents sign the consent form and answered the demographic characteristics questions. Moreover, the students and parents were informed about the voluntary nature of participation in the study. The children who returned demographic characteristics and consent forms were enrolled in the study.

The data were collected through the 24-item self-report questionnaire of children's stress symptom scale designed by Sharrer and Ryan-Wenger.³ This questionnaire assesses the experiences of stress in 7 to 12-year-old children using eleven cognitive-emotional symptoms and thirteen physical signs. Presence of a symptom scored with 1 yes = 1 and lack of symptom with zero no = 0. Two items of "nausea-vomiting" and "feeling sad" were added to other items after studying other literatures and totally 26 items were questioned. The range of obtained scores to the stress-related symptoms was from zero to 26 and stress symptoms were reported in three low, moderate and high le-

vels. The questionnaire was translated by the researcher and translation accuracy was checked and content validity were determined. The reliability of the CSSS in the study of Skybo and Buck¹¹ was obtained as 0.88 (Cronbach's alpha). The reliability of this scale in the present study was also determined 0.76 correlation coefficient using test re-test method. The data then were collected in a quiet room of school through interviewing with children in non-education hours. Data analysis was done using descriptive statistics by absolute numbers and percentages. Moreover, chi-square test was used to obtain the correlation between the variables. The analyses were done in SPSS software.

Results

There were 470 female students (56%) and 369 male students (44%). The students' average age was 10.46 ± 1.02 years (mean \pm SD). The age distribution of participants was 182(21.8%) nine-years-old children, 238 (28.5%) ten-years-old, 262 (31.4%) eleven-years-old and 153 (18.3%) twelve-years-old children.

809 children (96.4%) lived with their both parents; 21 children (2.5%) with mother, 4 children (0.5%) with father and 5 children (0.6%) with other family members. The most important events occurred for children during last year were "moving" (12.5%), "death of a close relative" (9.7%), "car accident" 4.1% and

"birth of a new brother or sister" (3.7%). Almost three percent of children [24(2.9%)] pointed out many symptoms (more than 18 items), 50.4 percent (423 children) had average number of symptoms (between 9 to 17 items) and 46.7 percent (394 children) had a low number of symptoms (less than 8 items).

The entire 26 items of the questionnaire were mentioned by the study subjects as the stress symptoms. Out of these 26 items, worry, "being afraid", "fast heart beating", "chills" and "feeling sad" were reported in more than fifty percent of children. Moreover, "headache" was reported by 46.6 percent of them. The most common stress symptoms in children are given in Table 1. It should be noted that "worry", "being afraid" and "feeling sad" are part of cognitive emotional stress symptoms and "tachycardia", "chills" and "headache" are part of physical stress symptoms. The lowest reported stress symptoms were "bad temper" (16.1%), "skin rash" (17.1%), "desire to hit someone" (17.6%), "nausea and vomiting" (18.6%) and "muscle stiffness" (23.4%). Furthermore, distribution of stress symptoms is given in Table 2 based on gender, grade and public and non-public schools. As indicated in this table, there was a significant correlation between these symptoms and some demographic factors ($p < 0.05$).

Table 1. Most common stress symptoms in primary school children of Tabriz

	Stress symptom*	No stress symptom*	Unresponsive**	Total**
Worry	580 (69.4)	256 (30.6)	3	839
Fast heart beating	458 (55.4)	369 (44.6)	12	839
Afraid	461 (55.3)	372 (44.7)	6	839
Chills	422 (50.8)	408 (49.2)	9	839
Feeling sad	418 (50.3)	413 (49.7)	8	839
Headache	384 (46.4)	444 (53.6)	11	839
Tiredness	347 (41.8)	483 (58.2)	9	839
Shame and embarrassment	340 (40.9)	491 (59.1)	8	839
Hunger	326 (39.2)	505 (60.8)	8	839
Sweating	324 (39.2)	502 (60.8)	13	839

* The data are given as n (%) **The data are given as n

Table 2. Percentage of stress symptoms by sex and grade of students, and type of schools in primary school children in Tabriz

Items	Gender			Grade				School type		
	Female	Male	P-value	3 rd	4 th	5 th	P-value	Public	Non-public	P-value
Madness	20.3	31.5	< 0.001	19.4	22.7	33.1	< 0.001	24.9	26.1	0.71
Worry	72.3	65.6	0.04	64	71.2	73	0.04	67.1	75.3	0.02
Crying	29.2	27.1	0.53	29.2	24.4	31	0.22	29.8	24.4	0.14
Early agitation	25.8	30.2	0.18	24	25.6	33.3	0.03	27.2	29.3	0.54
Being afraid	64.6	43.6	< 0.001	53.5	55	57.4	0.63	53.6	59.3	0.11
Bad temper	14.6	18.1	0.18	15.2	14.6	18.2	0.46	16.7	14.5	0.46
No clear thought	24.7	27.4	0.29	23.2	28.3	27.2	0.36	26.6	25.2	0.72
Thinking about death	22.9	27.1	0.16	18.6	23.8	31.6	0.002	25.2	23.7	0.71
Desire to hit someone	15.1	20.7	0.04	11.6	15.4	25.4	< 0.001	18.2	16	0.53
Embarrassment and shame	43.1	38.1	0.15	38.3	41.8	42.7	0.53	39.1	45.7	0.09
Feeling weird	20.4	36.4	< 0.001	26.4	26	29.8	0.53	24.9	34.2	0.009
Feeling sad	52.8	47.1	0.1	44.3	49.2	57.1	0.08	49.4	52.6	0.43
Headache	47.6	44.8	0.44	48	43.8	47.1	0.59	46.2	46.9	0.87
Stomachache	39.1	26.4	< 0.001	30.1	35.6	34.8	0.33	33.7	33	0.93
Sweating	36.4	42.7	0.07	40.4	41.9	35.7	0.29	38.8	40.4	0.69
Fast heart beating	60.5	48.9	0.001	47.5	57.1	61.5	0.003	53.3	61	0.05
Feeling unwell	30.3	28.7	0.64	32.3	30.6	26	0.23	28.6	32.2	0.3
Chills	57.5	42.3	< 0.001	50	48.9	53.4	0.52	49.1	55.5	0.1
Tiredness	39.8	44.4	0.2	39.6	45	41	0.42	41.7	42.1	0.93
Muscle stiffness	19.2	28.9	0.002	23.1	19.4	27.5	0.08	22.4	26.2	0.26
Face blushing and warmness	39.7	35	0.17	34.9	32.4	45.1	0.005	37.5	38	0.93
Weakness	34.8	31	0.26	28.4	34.7	36.3	0.11	31	38.6	0.04
Skin rash	16.2	18.3	0.45	19.8	15.4	16.1	0.33	17	17.5	0.91
Feeling cold	38.2	31	0.03	32.3	36.6	36.2	0.49	35.5	33.8	0.68
Hunger	33.5	46.6	< 0.001	38.9	39.9	38.9	0.96	40.8	35.2	0.15
Nausea and vomiting	18.7	18.5	1	24.9	15.6	15.2	0.004	18.9	17.7	0.76
Total	470	369	-	284	264	291	-	608	231	-

Discussion

This study aimed to investigate the stress symptoms in primary school children in Tabriz. Accordingly, the children showed a wide range of cognitive-emotional and physical symptoms in confrontation with stressful events. The entire twenty-six items of the questionnaire was mentioned as stress symptoms by the third to fifth grade students. More than fifty percent of children had 9 or more stress symptoms. Among cognitive-emotional symptoms of stress, worry, being

afraid and feeling sad and among physical symptoms tachycardia, chills and headache were reported by the majority of children.

There was a significant difference between male and female students in following items; madness, desire to hit someone, feeling weird, muscle stiffness and hunger which were more in males than in females. Worry, being afraid, stomachache, tachycardia, chills and feeling cold were more in females. In researcher's view, the differences between male and female students probably might be due to gender nature and characteristics.

Furthermore, there was a significant difference between grades in terms of stress symptoms. The items of madness, worry, tachycardia, thinking about death, desire to hit someone, feeling sad and early agitation, nausea and vomiting were more reported when students' grade increased. Moreover, face blush and warmth was higher in fifth grade while lower in fourth grade. The researcher believes the difference related to concern, thinking about death and sorrow was due to higher cognitive development of fifth grade students rather than third and fourth grades. However, conducting a comparative study is recommended for further investigation about these differences. Likewise, Students in non-public schools reported higher levels of "worry", "feeling weird", "fast heart beating" and "weakness" than public schools. Conducting more comparative studies also is recommended to evaluate these differences.

The findings of this study to some extent were in accordance with those of Sharrer and Ryan-Wenger³ and Skybo and Buck¹¹ but had some differences with the study of Hjern et al.¹⁰ In the study of Sharrer and Ryan-Wenger on 7 to 12-year-old American children, concern, unwell and fear were the highest cognitive-emotional symptoms and headache, stomachache, sweating and tachycardia were the highest physical symptoms.³ However, in Sharrer and Ryan-Wenger study, the items of rage and irritability considered as the highest stress symptoms but reported lesser in the present study. Skybo and Buck in their study on fourth grade primary school children in Ohio, United States, found that hunger, headache and irritability were the highest stress symptoms.¹¹ In addition, the item of "desire to hit someone" in their study was a frequently mentioned item; while in the present study, this item was one of the least reported items. In the study of Hjern et al. on 10 to 18-year old Sweden children, physical symptoms of headache, abdominal pains and other complaints such as feeling unwell, irri-

tability and rage were the most common stress symptoms.¹⁰ Hesketh et al.¹³ confirmed the prevalence of physical symptoms resulted from stress. Laessle and Lindel¹⁴ also surveyed the stress symptoms in depressed children; they also found physical symptoms of stress and subjective conception of stress feeling. Generally, in most of the mentioned studies, headache and stomachache were considered as the most common stress symptoms in school-aged children. In the present study headache was also reported in nearly half of the children and stomachache was reported in nearly one third of students.

The present study had some limitations similar to other studies as follows. Individual differences may affect on quality of responding in different ages. The subjects might not provide their real information to the researcher through the questionnaire. This problem was tried to be solved to some extent with ensuring about confidentiality of information.

Conclusion

The present study aimed to determine stress symptoms in 9 to 12-year-old children. By reviewing the obtained results of this study and other studies, we have come to realize that health educators and nurses in schools should have the necessary abilities to recognize emotional stresses symptoms and be able to provide required facilities and tools to prevent and control high-stressful situations for children and parents.² Children nurses teach children how to deal with the physical needs. Given that child's health would not be met only through biological factors and complex mental and social relations also are highly involved in children's health, nurses' functional areas would be extended from physical to social dimension and therefore social environment and schools are also included. Professional health staff must identify emotional and physical needs of children and reflect them to parents and teachers.^{1, 2, 15} Giving notice about the stress symptoms can inform parents, teachers

and professional health staff about physical and mental status of children and leads to stress reduction and its physical and mental signs.¹¹ The results of this study confirmed the presence of stress symptoms in children aged 9-12 years. Identifying these cases and future measures would be useful in order to improve children's health in these ages. On the other hand, identification of common stress symptoms can be effective in order to design school-based or family-based interventions and programs to identify common symptoms that cause many physical and behavioral problems of school-age children.¹⁶ Therefore, conducting further studies in this field and in a wider age range is recommended.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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