Research Paper | Education

Achievement of High and Low Stressed Science Students at Senior Secondary Level

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ABSTRACT   This study attempts to assess the achievement of high and low stressed senior secondary science students. A sample of 631 students was randomly selected from different institutions of Meerut province. They were administered Psychological Stress Scale for Science Students (PSSSS) developed by the researcher himself. Mean, S.D., and t-test, were used to analyze the data. Results show that the stress dimension examination and achievement has been emerged as the major factor causing stress, while health as the least causing factor for stress. The means of achievement of low stressed students for total psychological stress and its all dimensions were higher than that of high stressed students. It leads to the conclusion that high stress affects negatively the achievement of science students.

KEYWORDS : Psychological Stress, Senior Secondary Science Students, Achievement

Introduction

Stress refers to a dynamic interaction between the individual and the environment. In this interaction, demands, limitations and opportunities related to work may be perceived as threatening to surpass the individual's resources and skills (Kohler, et al 2006). In case of disarrangement, this interaction may lead to cognitive, emotional and behavioural alterations. Some of the most common stressors are time pressures, workload, making decisions, continuous changes and economic mistakes at work. Senior secondary school years should be a new and interesting experience, but many demands and rapid changes can make them one of the most stressful times of the life. Students of this stage face increasing amounts of schoolwork, a rapidly changing curriculum, assignment deadlines and exams. Students worry about selecting careers and post schooling programmes. Getting high grades is the important source of stress for students, In addition, there are other important sources of stress such as homework, assignments and uncomfortable classrooms, relationships with faculty members and friends, eating and sleeping habits and time pressure may also be sources of stress.

Students have to balance their schoolwork with their hobbies, sports and daily life. They have conflicts with friends, siblings, parents and have to adjust themselves with other environmental demands. Further, Science students have many obstacles to overcome in order to achieve optimal academic performance as compared to humanities students. Most of the time, science students have complain of dwelling in between their efforts for better achievement and teacher's/ parent's expectations. Most of the studies in different responses to stress have been carried out in dental, medical, nursing, university and college students (Sinha, et al 2000, Lee et al 2002, Kuruppuarachchi, et al 2002, Ellison, 2004, Polychronopoulou, Argy and Divaris, Kimon 2005, Hussain, et al 2008, Kumar and Singh 2004, Kaplan, et al 2005, Chapell, et al 2005, Vijayalakshmi and Lavanya 2006, Nicholson 2009, and Hasan 2009). Many scholars in the field of behavioural science have carried out extensive research on stress and its outcomes and concluded that the topic needed more attention. The researcher found that there is no much research conducted particularly in Western U.P in India pertaining to this issue. In the present study, the researcher attempted to study the achievement of high and low stressed senior secondary students.

Objectives

1. To study the nature of psychological stress and achievement of senior secondary science students.

2. To study the significance of difference between high and low stressed senior secondary science students on achievement.

Research Methodology
Method

Methods of research are generally determined by the theory of the topic under study, objectives of the study, resources of researchers etc. These considerations have led the investigator to use the descriptive survey method of research for the present study.

Participants

For this study, science students officially enrolled in 12th standard were taken from seven types of institutions running in Meerut province. Using simple random sampling, 100 senior secondary science students were selected from each type of institutions. Out of 700 science students only 631 students were finally taken because 69 students did not fill the scale properly.

Material and Procedure

To achieve objectives of this study Psychological Stress Scale for Science Students (PSSSS) developed by the researcher was used to measure psychological stress of science students. It was structured around the 12 dimensions of psychological stress i.e. curriculum transaction in science, content of science, infrastructure for science, science teachers, peers, workload in science, examination and achievements, home and family environment, vocational aspiration, health, communication problems and society. There are 96 items in this scale. Each item was followed by five options, namely, 'Always', 'Often', 'Sometimes', 'Rarely', ans 'Never'.

Data Analysis Techniques

To study the nature of psychological stress, its all dimensions and the achievement of all the science students (N = 631), mean and standard deviation (S.D.) were calculated. To find out the difference between high and low stressed science students on achievement, scores on total psychological stress were sorted in descending order. Then upper 27% students on total psychological stress were treated as high stressed students and lower 27% students were treated as low stressed students. Out of the total sample of 631 students, 170 students each were taken in high and low stressed group. After this classification t-test was used to find out the significance of difference between high and low stressed science students on achievement. Similar process was adopted for each dimension of psychological stress. Results are presented in Table-1, 2, &3.

Results

Analysis and interpretation of results are given objective wise in following sub headings-

I. Nature of Psychological Stress among Senior Secondary Science Students

Table – 1
Statistics showing the nature of distribution of psycho-logical stress (N = 631)

Stress Dimensions	Mean	S.D.
Curriculum Transaction in Science	23.097	5.704
Content of Science	20.781	5.810
Infrastructure for Science	21.594	7.660
Science Teachers	24.071	7.318
Peers	21.204	6.591
Workload in Science	22.179	6.752
Examination and Achievement	24.727	6.639
Home and Family Environment	21.471	7.201
Vocational Aspiration	23.273	6.914
Health	19.488	7.335
Communication Problems	20.515	6.879
Society	20.187	6.903
Total Psy. Stress	262.362	58.154

It is evident from Table-1, that means of the different dimensions of psychological stress were found to vary from 19.448 to 24.716. It is also depicted from Table 1 that mean of total psychological stress score of all students was found to be 262.362 which was of moderate level. Further, mean stress score (24.727) of all the students was found to be greater on the psychological stress dimension Examination and achievement followed by the dimensions Science teachers (24.071),Vocational aspirations (23.273), Curriculum transaction in science (23.097) and workload in science (22.179) in comparison to all the other dimensions, where as the lowest mean stress score (19.488) of science students was found due to psychological stress dimension health followed by society and communication problem.

II. Nature of Achievement of Senior Secondary Science Students
Table - 2
Statistics showing the nature of achievement of science students (N= 631)

Variable	Mean	S.D.
Achievement	117.586	26.498

Table 2 shows that mean of Achievement scores of senior secondary science students was found to be 117.586 followed by the S.D. value 26.498.

III. Difference Between High and Low Stressed Science Students on Achievement
Table - 6
Difference between high and low stressed science students on achievement

Psychological Stress	Achievement of Low Stressed Students (N = 170)		Achievement of High Stressed Students (N = 170)		t-value
	Mean	S.D.	Mean	S.D.	
Total Psychological Stress	128.17	23.64	107.12	25.48	7.87**
Curriculum Transaction in Science	122.22	27.07	109.46	25.60	4.45**
Content of Science	126.19	26.87	107.49	26.63	6.42**
Infrastructure for Science	125.31	24.14	112.46	27.06	4.60**
Science Teachers	120.32	26.22	114.58	26.41	2.01*
Peers	123.66	24.04	106.54	25.92	6.30**
Workload in Science	123.53	26.01	111.75	27.00	4.09**
Examination and achievement	125.43	24.84	110.08	26.06	5.54**
Home and Family Environment	126.58	22.78	111.51	27.63	5.47**
Vocational Aspiration	124.00	25.38	107.56	26.01	5.88**
Health	125.54	24.65	109.51	25.93	5.83**
Communication Problems	127.18	24.06	108.96	28.54	6.34**
Society	121.49	24.66	111.86	27.31	3.40**

It is evident from Table - 6 that t-values between the means of high and low stressed students on achievement for total psychological stress and its all dimensions, except science teachers, were found to be significant at 0.01 level while t-value for the dimension science teachers was significant at 0.05 level. It is also depicted that means of achievement of low stressed students for total psychological stress and its all dimensions were higher than that of high stressed students. It leads to the conclusion that high stress affects negatively the achievement of science students.

Conclusions
It is apparent from the findings of this study that science students were found to be under stress in the process of studying science at senior secondary level. Out of the12 dimensions that have been considered for taking as factors responsible for causing psychological stress, the dimension examination and achievement has been emerged as the major factor causing stress. Science teachers, Vocational aspirations and Curriculum transaction in science and workload in science have also been emerged as major causing factors of stress among science students. As far as workload in science is concerned, the reason for this is very obvious. Science students as compared to arts students always have much workload. The way that science is taught seems to be a major area of concern for the students. Science students feel stressed due to additional practical and assignments. There has been realization among educationists to attempt to reduce the workload. These findings are supported by the findings of Saipanish (2003), who found that heavy work load, examinations and meeting deadlines for assignments were the most common causes of stress. Earning high grades is not the only source of stress for college students. Vocational aspiration has been emerged as another area causing stress among science students. This finding is supported by the results of Kadapatti and Khadi (2006) and Huan, et al (2008). Huan, et al (2008) showed that academic stress arises from self and other expectations, in both the boys and the girls. With changes taking place in the profile of the labor markets, fewer opportunities are available in a profession related to the pure sciences. Thus, most science students start preparing themselves for accessing suitable careers from the school level itself. This course must cover psychological, mental, social, and cultural contents and be incorporated into formal curricula of each department. The stress resulting due to the dimension health was found to be the lowest out of the twelve dimensions. The means of achievement of low stressed students for total psychological stress and its all dimensions were higher than that of high stressed students. It leads to the conclusion that high stress affects negatively the achievement of science students. It means that more psychological stress results in poor achievement. This finding is supported by the earlier findings of ISR (1996), Kumar and Singh (2004), Kaplan, et al. (2005), Chapell et al. (2005), Vijayalakshmi and Lavanya (2006), Nicholson (2009), Hasan (2009). Khalid and Hasan (2009) found that students with high academic achievement have low test anxiety scores and vice versa. Kumar and Singh (2004) indicated that the level of stress among the students interfered with the performance in examination, test etc.

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