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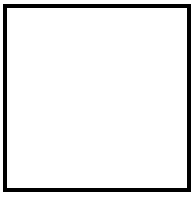

# Development of a scale for assessing academic stress: a preliminary report

**Dr. Uday K. Sinha**[1]
**Dr. Vibha Sharma**[2]
**Dr. Mahendra K. Nepal**[3]

## ABSTRACT

**This article describes the process of development and standardization of the Scale for Assessing Academic Stress (SAAS) on a sample of 400 high school and college students of different grades. Thirty item scale prepared based on 'yes' and 'no' format was found to have high test-retest and split-half reliability, adequate internal consistency, adequate validity against Academic Anxiety Scale for Children (AASC) and Beck Depression Inventory (BDI), and ability to yield normally distributed data on academic stress. Separate norms for boys and girls of different grades (grade VIII to grade XII) were developed. Clinical, research, educational and other implications of the scale is discussed along with the need for further studies on different population.**

*Key words: Scale; academic stress; reliability; validity; norm; internal consistency.*

## INTRODUCTION

It is a "cultural truism" that stress is associated with impairment of health and the negative emotional experiences associated with stress are detrimental to “quality of life and sense of wellbeing” (Sinha, 2000). Out of number of stress faced by adolescents and young adults, academic stress emerges as significant mental health problems in recent years (Rangaswamy, 1995). It has been estimated that 10% to 30% students experience academic related stress that affects their academic performance (Johnson, 1979; Hoghughi, 1980; Brackney & Karabenick, 1995), psychosocial adjustment (Phillips, 1978) along with their overall emotional and physical wellbeing. Information load, high expectations, academic

[1] PhD, Department of Psychiatry & Mental Health, Institute of Medicine, Kathmandu, Nepal.
[2] PhD, Department of Psychology, St. John's College, Agra, India.
[3] MD, Department of Psychiatry & Mentl Health, Institute of Medicine, Kathmandu, Nepal

burden or pressure, unrealistic ambitions, limited opportunities, high competitiveness are some of the important sources of stress which creates tension, fear, and anxiety. Poor academic performance, diminished peer popularity, depression, attention difficulties, somatic complaints, substance abuse are commonly observed problems among the victims of academic stress without being aware of how to cope with them (Sinha, 2000; Rangaswamy, 1995; Brackney & Karabenick, 1995; Rao & Parthasarathi, 1993; Strauss, 1990; Segal, Hobfoll, & Cromer, 1984). Stress and such problems usually form a "positive feedback loop or vicious circle" as they themselves act as significant sources of stress and sensitize the students to the other sources of stress by reducing his or her ability to cope (Kiselica et al, 1994). Hence, management of academic stress becomes essential in the process of producing quality human resources for the nation.

Assessment is very important aspect of understanding and managing stress and its complications. Being a subjective experience, stress can be better assessed through self-report of the concerned individual. In this study an effort has been made to develop a self-administered scale for assessing academic stress and to standardize it on high school student population.

## MATERIAL AND METHOD

### Sample

A random sample of 400 (male 200, female 200) school students studying in grades VIII to XII was selected from different schools and colleges of Kathmandu City and used in the study. The schools from which the sample was selected were English medium schools having students from middle to higher middle socio-economic background.

### Tools

1. **Scale for Assessing Academic Stress** (SAAS): A 30-item self-report measure developed to assess all possible major indicators of academic stress in terms of their presence or absence. The subject has to select one out of two alternative responses (*yes* and *no*) for each item of the scale. All yes responses are given 1 point each and summed-up to get total stress score.
2. **Academic Anxiety Scale for Children** (AASC): AASC is a 20-item scale developed by Singh & Sen Gupta (1984) for measuring anxiety related to academics and academic situations. It has 16 positive and 4 negative items for which responses are given either in 'yes' or in 'no'. For positive items 1 point is given to each *yes* response and for negative items 1 point is given to each *no* response. Total score is converted into percentile score to find out the descriptor of anxiety. The scale has adequate reliability and validity.
3. **Beck Depression Inventory** (BDI): Developed by Beck et al in 1961 and reviewed several times since then (Beck, Steer, & Garbin, 1988), BDI is a 21-item self-report measure to identify presence and severity of different symptoms of

depression. It is widely used tool with well proven psychometric properties.

**Procedure**

Initially a 45-item scale was prepared on 'yes' and 'no' format after reviewing literature on academic stress and consulting experts in the area. Items of the scale were written in simple English language that can be easily understood by students with VIIth grade education in English medium. The scale was then given to a sample of 100 students studying in different grades (VII-XII) to give their responses individually. After item-analysis which was done using the data of 100 subjects, 15 items were dropped out and 6 items were modified according to the need felt. Thus the remaining 30 items were retained in the final form of the scale.

The final form of the Scale for Assessing Academic Stress (SAAS) was administered on the randomly selected sample of 400 students after seeking permission of the school and the college authorities. After completing SAAS, all the subjects were given Academic Anxiety Scale for Children (AASC) and Beck Depression Inventory (BDI) to complete. The obtained data on all the three measures were subjected to appropriate statistical analyses.

## RESULTS

Principal Component Analysis (PCA) of the SAAS data with Varimax rotation revealed five independent factors explaining more than 83% of the variance (Table I). These five factors are five components of academic stress indicating expression of academic stress through different channels: cognitive, affective, physical, social/interpersonal, and motivational. Table II depicts the items of SAAS responsible for each factor with their factor loading. All the items under each factor have fairly high loading ranging from 0.60 to 0.85.

**Table I:** Principal factors emerged for SAAS

| Factors | Name of the Factors | Eigen Values* | Percentage of Explained Variance | Cumulative Percentage of Explained Variance |
|---|---|---|---|---|
| 1 | Cognitive | 14.77 | 47.90 | 47.90 |
| 2 | Affective | 8.63 | 14.20 | 62.10 |
| 3 | Physical | 5.40 | 10.50 | 72.60 |
| 4 | Social/Interpersonal | 2.15 | 5.70 | 78.30 |
| 5 | Motivational | 1.03 | 4.80 | 83.10 |

* Eigen values greater than one are considered significant in determining the factors

**Table II:** Items of factors with their factor loading

| *Items under the factors* | *Loading* |
|---|---|
| **Factor-1 (Cognitive Indicators)** | |
| 1. difficult to concentrate | .78 |
| 3. forget easily | .67 |
| 22. day dream a lot | .65 |
| 24. difficulty in problem solving | .71 |
| 27. don't answer | .60 |
| 28. doubt my abilities | .68 |
| 29. hesitate in asking | .63 |
| **Factor-2 (Affective Indicators)** | |
| 4. feel inferior | .68 |
| 7. lack confidence | .82 |
| 10. feel under pressure | .77 |
| 13. feel failure | .71 |
| 14. worry about parents' expectations | .69 |
| 30. feel sad about | .76 |
| **Factor-3 (Physical Indicators)** | |
| 2. get headache | .75 |
| 6. get nervous | .63 |
| 16. less desire to eat | .71 |
| 20. loss of sleep | .78 |
| 26. heart beats fast | .69 |
| **Factor-4 (Social/Interpersonal Indicators)** | |
| 12. no body to help | .61 |
| 15. get irritated with everyone | .72 |
| 17. not feel like talking to | .68 |
| 18. like to stay alone | .70 |
| 25. nobody understands me | .72 |
| **Factor-5 (Motivational Indicators)** | |
| 5. lack interest in | .85 |
| 8. not enjoy extracurricular activities | .61 |
| 9. difficulty in completing lessons | .77 |
| 11. get bored easily | .80 |
| 19. feel to discontinue | .71 |
| 21. not feel like going to school/college | .65 |
| 23. feel sleepy | .78 |

The test-retest reliability of SAAS over the period of one month is 0.88 and split-half reliability is 0.75 indicating adequate reliability of the scale (Table III). Internal consistency of the scale is also adequate being in a range of 0.30 and 0.81 (Table IV). The correlation coefficient of SAAS with AASC and BDI were found to be 0.54 and 0.43 respectively (Table V). Its correlation with AASC is statistically significant at 0.05 level, however with BDI it is not statistically significant.

When the pattern of distribution of SAAS scores of all the subjects was analyzed, the mean score was 5.06 with standard deviation of 2.78 and the pattern of distribution of score followed the pattern of *normal distribution* (Table VI). A grade wise norm in terms of mean and standard deviation for both genders is given separately in Table VII.

**Table III:** Reliability coefficients of SAAS

| *Types of Reliability* | *Values* |
|---|---|

| | |
|---|---|
| Test-retest reliability<br><br>(one month interval) | .88 |

| | |
|---|---|
| Split half Reliability | .75 |

**Table IV:** Internal consistencies of SAAS items

| *Items* | *Correlation coefficient* | *Items* | *Correlation coefficient* | *Items* | *Correlation coefficient* |
|---|---|---|---|---|---|
| 1 | .81 | 11 | .33 | 21 | .40 |
| 2 | .56 | 12 | .39 | 22 | .65 |
| 3 | .48 | 13 | .72 | 23 | .58 |
| 4 | .52 | 14 | .58 | 24 | .52 |
| 5 | .66 | 15 | .49 | 25 | .38 |
| 6 | .45 | 16 | .30 | 26 | .75 |
| 7 | .61 | 17 | .38 | 27 | .45 |
| 8 | .52 | 18 | .35 | 28 | .40 |
| 9 | .39 | 19 | .44 | 29 | .55 |
| 10 | .55 | 20 | .68 | 30 | .74 |

**Table V:** Validity coefficients of SAAS

| *Criteria* | *Values* | *P values* |
|---|---|---|
| Academic Anxiety Scale for Children (AASC) | .54 | .0512 |
| Beck Depression Inventory (BDI) | .43 | .0601 |

**Table VI:** Distribution of the subjects according to the distance of their scores from the Mean SAAS score (Normal Distribution)

| *Distance from the Mean SAAS Score (5.06 ± 2.78)* | *Number of the Subjects (N=400)* | *Percentage of the Subjects* | *Cumulative Percentage* |
|---|---|---|---|
| ± 1 S. D. | 268 | 67 | 67 |
| ± 1 S. D. – ± 2 S. D. | 82 | 20.5 | 87.5 |
| ± 2 S. D. - ± 3 S. D. | 27 | 06.75 | 94.25 |
| > ± 3 S. D. | 23 | 05.75 | 100 |

**Table VII:** Norms for SAAS across grades and genders (SDs are given in parentheses)

| *Grades** | *Male (N-200)* | *Female (N=200)* |
|---|---|---|

| | | |
|---|---|---|
| VIII (N=70) | 3.80 (3.18) | 4.75 (2.66) |
| IX (N=100) | 5.12 (3.04) | 4.86 (2.17) |
| X (N=100) | 5.75 (2.08) | 5.03 (3.02) |
| XI (N=80) | 5.52 (2.35) | 4.96 (2.76) |
| XII (N=50) | 5.63 (2.01) | 4.85 (1.96) |

* *Equal number of male and female subjects across the grade*s

## DISCUSSION

The very need of having an assessment tool to measure academic stress in school and college students which is capable of measuring maximum number of stress indicators, has been the basic motivation behind this project. As results of PCA indicated, the scale had been able to extract five major dimensions of stress reaction related to academics and academic environment. These dimensions cover the whole range of stress reaction in human being described in the literature on human stress (Wilkins, 1982; Jenkins, 1979). Items of the scale included under these five dimensions were found to have large factor loading indicating high strength of items in measuring these dimensions. Because of these characteristics, SAAS can be said to have adequate content validity.

Psychometric properties of any scale are the real criteria for adequacy and strength of that scale. Reliability coefficient was found very high by either of two methods: test-retest and split-half method. High test-retest reliability hints two possibilities; first, the characteristic of the scale and secondly, the persistence of stress over long time period or the stress is not self-remitting. Thus, it provides strong suggestion for timely intervention to manage academic stress. The scale has shown moderate correlation with Academic Anxiety Scale for Children and insignificant correlation with Beck Depression Inventory. This does indicate that the concept of stress is different from anxiety and depression, though they are very common affective symptoms of stress reaction; and SAAS is developed to measure stress not anxiety or depression. Thus the validity of the scale becomes more specific. Moderate correlation of SAAS with AASC may be explained on the basis of common contextual factor, i.e. academic situation.

The scale has shown adequate capacity to draw normally distributed data with regards to academic stress in school and college students. The percentage of students scoring within one standard deviation from mean is 67%, between one standard deviation to two standard deviations from mean is 20.5%, between two and three standard deviations from mean is 6.75%, and beyond three standard deviations from mean is 5.75%. These figures are very near to the range of normal distribution curve making the mean score 5.06 a valid norm for the SAAS score with standard deviation 2.78. This norm can be used for interpreting score of the students of grade VIII to grade XII. As grade increases, the difficulty level of the curriculum also increases needing more effort and more time

of the student. Thus the stress level will definitely vary according to the grades, lower grade having chances of less stress and higher grade having chances of more stress. Based on this common assumption, the grade wise responses of the subjects were analyzed, which went along with the assumption. The mean SAAS score of grade VIII was definitely less than the mean SAAS score of grade XII. Similarly, gender also accounted for difference in normal academic stress level across the grades. Male students have more academic related stress than female students from grade IX onwards. This may be because of gender specific expectations of the society where expectations are more from the male. Since the grade wise norms are drawn from the normally distributed data, the applicability of these norms to general student population is very high.

With all its psychometric properties and simplicity the scale (SAAS) can be used in various setting including clinical, educational, and guidance & counseling for different purposes like identifying and estimating academic stress among students, planning and monitoring intervention strategy, developing research in the area of academic stress, evaluating the efficacy of counseling for coping with academic stress, and sensitizing students, parents, and teachers with academic stress.

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