INTRODUCTION

Adolescence is a time of transition, which happens to place an individual on those transverse paths where adjustments and coping becomes difficult. Change by itself is stressful and when this change happens to be a part of a growing youth's physiological, psychological, social and environmental scenario, it is surely to increase the intensity of anxiety and stress. Anxiety, stress, negative mood, low achievement motivation and self-esteem are allied with all the age groups but these are higher in intensity in adolescence, primarily due to immense changes that are unfolded in their lives everyday.

Adolescence has been termed as the period of stress, storm and strain and has also been termed as the terrible teens (Mythili, Bharathi & Nagarathna, 2004). Though people's perceptions have changed, yet adolescent female students in India even today deal with higher authoritative practices and restrictions imposed on them by their parents and teachers. Making adjustments with one's own self, family, peers, teachers and society at large, imposed demands and their inability to stand up to all the expectations further results in anxiety, stress, negative mood, low achievement motivation and self-esteem.

Keith, Hodapp, Schermellich-Engle and Moosbrugger (2003) explain that according to Spielberger personality states are conceptualized to be mainly determine by situational characteristics and the personality traits are viewed as relatively enduring inter individual differences in tendencies to react and behave in a particular personality trait. The stronger a particular personality trait, higher is the probability that an individual will experience the emotional state corresponding to this trait. Test anxiety is a situation specific trait and is conceptualized to capture inter individual differences in
the general tendency to react with anxiety in certain situations (Hodapp, Glanzmann & Laux, 1995). State, trait and test anxiety are inevitable regular components affecting their performance and relations too.

Stress is an unpleasant state of emotional and physiological arousal which individuals experience in situations that they perceive as threatening to their well being (Singh, Tomar & Khokhar, 2005). Stressors are apart of the daily lives of adolescents encompassing difficulties with their parent’s expectations, teacher’s authority, peer’s rejection and arguments, failure in academic performance, dealing with opposite gender relations, personal inadequacies and illness. Negative affectivity is pervasive negative mood marked by anxiety, depression and hostility (Watson & Clark, 1984), mood fluctuations and unexplainable behaviours too hinder the adolescents performance and life.

Achievement motivation involves accomplishing and organizing the physical and social involvement, overcoming obstacles and competing to maintain high standards of work (Lindgren, 1993). Adolescent’s achievement motivation is much seen in their academic and curricular performance. Though the desires to achieve and prove oneself are very high during this phase. Self-esteem involves the values that an individual places in himself and is a judgment of whether his abilities and qualities accomplish or not, the standards on believes to be ideal (Pope, McHale & Carigheal, 1988). Adolescent’s self esteem is easily susceptible to being thwarted due to their failures, rejection by peers, criticism faced from teachers and family, low achievement and felling of hopelessness.

State anxiety, trait anxiety, test anxiety, stress, negative mood, low achievement motivation and low self esteem do not exist as segregating components but are instead a multidimensional construct affecting each
other and the adolescent personality and well being. Holistic approaches are thus needed to deal with adolescent’s multi unified tribulations such that they develop into a healthy positive generation of tomorrow.

Yoga offers a way out of the whirlpool of stress and is a holistic solution to stress (Bhavanani, 2004). Yoga is an efficient holistic therapy taking into consideration the unity of the mind and body in dealing with an individual. Yoga includes rhythmic breathing, postures, conscious concentration, mediation, healthy habits and thought rectification. It also serves as a devise for an individual’s well being, by serving as a preventive, curative and promotive therapy. Stress of the modern world is making adolescents its victim, who thus they must learn to be more self controlled and calm to fight back all the hardships, for which yoga serves as their redeemer and serves as an indemnity for their future.

PRESENT STUDY

The present study is an attempt to understand how yoga therapy can help in dealing with anxiety, stress and other components such as negative mood, achievement motivation and self-esteem of adolescent female students. It also aims at knowing if there is a significant relationship between the state anxiety, trait anxiety, test anxiety, stress, negative mood, achievement motivation and self-esteem. The present study also attempts to know whether there is any difference among the Science and Arts adolescent students with regard to their anxiety, stress, negative mood regulation, achievement motivation and self-esteem levels. Yoga involves every aspect of existence, spiritual, emotional, mental and physical. It is a system of conscious evolution or self-improvement, which has been cherished over
thousand of years of its documented existence and this present study attempts to find its effectiveness on the psychological variables undertaken in this study.

**OBJECTIVES**

(I) The aim of the present study is to know whether there is any difference among the Arts and Science adolescent subjects with regard to their state anxiety, trait anxiety, test anxiety, stress, negative mood regulation, achievement motivation and self esteem.

(II) The study also aims to study the relationship among the state anxiety (STAI-XI), trait anxiety (STAI-X2), test anxiety (TAI-H), stress (SI), negative mood regulation (NMRS), achievement motivation (AMS) and self esteem (SEI).

(III) The prime objective of the present study is to know the effect of yoga therapy in curtailing state anxiety, trait anxiety, test anxiety and stress and in enhancing negative mood regulation, achievement motivation and self esteem of the adolescent female subjects.

**HYPOTHESES**

(1) The Arts and Science subjects will differ on all the dependent variables used in this study.

(2) State anxiety, trait anxiety, test anxiety, stress, negative mood regulation, achievement motivation and self-esteem are interrelated.
(3) Yoga therapy will be effective in curtailing state anxiety, trait anxiety, test anxiety and stress.

(4) Yoga therapy will be effective in enhancing negative mood regulation, achievement motivation and self-esteem.

**METHODOLOGY**

**SAMPLE:** The sample comprised of a hundred female adolescent +1 and +2 students, within the age range of 16-19 years from Auckland House School of Shimla. The randomly selected sample had fifty Arts and fifty Science female adolescent subjects out of which twenty-five Arts and twenty-five Science subjects participated in yoga therapy treatment workshop. The rest twenty-five Arts and twenty-five Science female subjects were taken as no treatment control group. The factors that are controlled are educational qualification, gender, age and institute, such that the activities being faced by the subjects are more or less similar during the time of yoga therapy workshop.

**EXPERIMENTAL DESIGN:** A (2x2x2) AXBXC analysis of variance design is used in this study. ‘A’ here denotes two class of subjects (Arts and Science), ‘B’ denotes the two groups (Yoga therapy treatment group and no treatment control group), and ‘C’ denotes the two trials (pre and post).

**PREPARATION AND STANDARDIZATION OF THE STRESS INVENTORY:** The Stress Inventory has been prepared for the purpose of knowing the stress causing factors of the female adolescent students. For this purpose eleventh and twelfth grade female science students were used, as it
was assumed that perhaps these students experience greater levels of anxiety and stress.

On analyzing the stated stress items with the help of adept psychologists thirty stress causing items were short listed under the five categories with 'Family', 'Education', 'Friends' and 'Health' comprising of five items each and 'Behaviour and Personal' category comprising of ten items. A three-point scale was used whereby every item had three optional responses 'Never Stressful', 'Sometimes Stressful' and 'Always Stressful'. 'Never Stressful' is scored (0), 'Sometimes Stressful' is scored (1) and 'Always Stressful' (2). The highest score a subject can get is sixty and the lowest one can get is zero.

The Stress Inventory is standardized by assessing its reliability and validity for the female adolescent subjects used as the sample for the present study (Arts and Science, N=100). In order to measure the internal consistency reliability Cronbach's alpha has been calculated for the whole Stress Inventory and also for the sub categories of 'Family', 'Education', 'Friends', 'Health', 'Behaviour and Personal' of this inventory. All these values are highly significant at (p<.001) level. The test- retest reliability of .69 has turned out to be significant at (p<.001).

The construct validity of the Stress Inventory calculated by Pearson Product Moment correlation shows that there is a high positive correlation between SI and STAI-XI, STAI-X2 and TAI-H and high negative correlation between SI and NMRS and SEI (p<.001). The reliability and validity performed for the Stress Inventory standardization proves the Stress Inventory to be reliable and valid.
INVENTORIES USED

1. (STAI-X1) State Trait Anxiety Inventory X-1 (Spielberger, Gorsuch & Lushene, 1970) consists of twenty items indicating statements so as to how one 'feels at that moment' measuring the state anxiety. Each statement has four response options 'Not at all', 'Somewhat', 'Moderately so', and 'Very much so'.

2. (STAI-X2) State Trait Anxiety Inventory X-2 (Spielberger, Gorsuch, and Lushene, 1970): consists of a form comprising of twenty items each. The STAI-X1 form indicates statements so as to how one feels 'generally' measuring the trait anxiety. Each statement has four response options 'Not at all', 'Somewhat', 'Moderately so', and 'Very much so'.

3. (TAI-H) Test Anxiety Inventory (Sud and Sud, 1997): comprises of twenty items, each consisting of four response options 'Almost never', 'Sometimes', 'Often', and 'Almost always'. The inventory assesses individual differences in anxiety proneness in test or examination situations.

4. (SI) Stress Inventory (prepared in English by the investigator of this research herself): comprises of thirty items, consisting of three response options 'Never Stressful', 'Sometimes Stressful', 'Always Stressful'. This inventory assesses the stress level of the adolescent female students only, with regard to issues of the family, education, friends, health, behavioural and personal.

5. (NMRS) Negative Mood Regulation Scale (Catenzaro and Mearns, 1990): comprises of thirty items, each consisting of five response options 'Strongly Disagree', 'Mildly disagree', 'Agree Disagree Equally', 'Mildly Agree', and 'Strongly Agree'. This questionnaire
seeks to find out what people believe they can do about upsetting emotions.

6. **(AMS) Costello Achievement Motivation Scale** (Misra, and Srivastava, 1990): comprises of twenty-four items each consisting of two response options ‘Yes’ and ‘No’. This questionnaire is used to assess the achievement motivation of a person.

7. **(SEI) Self - Esteem Inventory** (Coopersmith, 1975): comprises of twenty-five items, consisting of two response options ‘Like Me’ and ‘Unlike Me’. This is used to measure evaluative attitudes towards the self in social, academic, family and personal areas of experience.

**INTERVENTION**

1) **Yoga Therapy Programme**: Most of the problems pertaining to the students were dealt with in this workshop. The workshop included ‘Pranayama’: suryabedi, sitali, sitkari, bhashrika, bhramri, ujjai and kapalbhati. ‘Sukhsham vyam’: ‘Mudars’: kaki, shambhavi, bhujangi, yoni and taragi. ‘Asanas’: bhujang, nauka, aeri darshan, kon, trikon, pawanmukt, vriksh, ushtra, shalabh and shav asana/yoga nidra. ‘Meditation’.

   Everyday prior to the actual session ‘Om Chanting’ was carried out by the subjects in a relaxed posture. Every session ended with five to ten minutes of interactive session where students discussed their problems. The subjects were well informed about the precautions that they have to bear in mind while performing yoga.

   The workshop was for four weeks with six days and forty five minutes daily in hand to carry out the schedule. That which was performed
one day was rehearsed the next day, which helped the subjects to rehearse on what had already been taught previously. New add-on was also included.

2) No Treatment control Group: these groups of subjects are not given any intervention in between the pre and post assessment trials for all the inventories used. These no treatment control group subjects fill up the inventories at the same time as that of the yoga therapy treatment group subjects, that is, prior to beginning of the yoga therapy workshop and when it is over after a period of one month without being given any intervention.

INSTRUCTIONS: The instructions imparted to the subjects of yoga therapy treatment group and no treatment control group with regard to filling up the inventories were administered in the same manner. The instructions are written clearly in the beginning of every inventory for the convenience of the subjects. The subjects were asked to read these instructions carefully before providing their respective answers.

PROCEDURE: The Arts and Science treatment group subjects [TG1(A), TG2(S)] were administered all the inventories prior to the yoga therapy workshop, and were given a theoretical summary of all that was going to be conducted in the one month session. For a time period of one month, the sessions on yoga therapy were carried out for forty-five minutes daily excluding Sundays. The same inventories were administered to the Arts and Science treatment group subjects after the one month session was completed.

The Arts and Science no treatment control group adolescent subjects were not given any treatment session for that period of one month.
but were administered the inventories before and after the one month period. The subjects were asked to read instructions and items carefully and fill in the inventories by being utmost true to themselves.

STATISTICAL ANALYSIS

(1) PEARSON PRODUCT MOMENT CORRELATION: has been employed to find out the test-retest reliability and the construct validity of the Stress Inventory (Bruning & Kintz, 1987). It has also been used to find out the inter relation among the dependent variables (STAI-X1, STAI-X2, TAI-H, SI, NMRS, AMS, SEI) used in this study.

(2) CRONBACH’S ALPHA: This internal consistency method of correlation is used to find out the reliability of the Stress Inventory prepared. The Cronbach’s alpha for the whole test and its sub categories were calculated and reported in the relevant text (Carmines & Zeller, 1983).

(3) ANALYSIS OF VARIANCE (ANOVA): This statistical analysis is employed to know the difference among the Arts and Science adolescent female subjects on all the dependent variables.

Further one ways analysis of variance has been employed to find out the pre differences existing among the treatment and control groups for the two class of subjects (Arts and Science) for all the dependent variables individually.

Preliminary one way analysis of variance is then calculated on the pre and the post scores of all the treatment and control groups of the two class of subjects (Arts and Science) for each dependent variable as a
prerequisite before performing the analysis of covariance (Garrett and Woodworth, 1981).

Single group method of analysis of variance is then used to find out the pre to post mean score differences among the treatment and control groups for the two class of subjects (Arts and Science) for all the dependent variables.

(4) ANALYSIS OF COVARIANCE (ANCOVA): Analysis of covariance has been used to control the initial differences and further adjust the post scores. Here post (adjusted) F value is calculated by adjusting among and within variances of the post scores. Analysis of covariance is used to determine whether the groups differ in the post scores as a result of the intervention (Garrett and Woodworth, 1981). Analysis of covariance has been performed due to the pre differences reported by the one way analysis of variance carried out on the treatment group and control group for the two class of subjects individually.

(5) DUNCAN’S MULTIPLE-RANGE TEST: All the post hoc comparisons among the post (adjusted) means have been made by Duncan’s Multiple-Range Test (Bruning and Kintz, 1987).

RESULTS AND DISCUSSION

Analysis of the difference among the Arts and Science adolescent students on all the dependent variables used in the study

There was no significant difference seen in the scores of Arts and Science female adolescent subjects on the state anxiety, trait anxiety, test anxiety, stress, negative mood regulation and self-esteem measures used as
dependent variables of this study. There is a significant difference seen among the Arts and Science subjects only in their scores of achievement motivation scale (p<.025). The Science females show a higher level of achievement motivation than their Arts counterparts.

Though it has been assumed that the science students are more stressed and have a higher level of state, trait and test anxiety due to their difficult study course, more study pressure as compared to the Arts students, this has not been so as revealed by the present study. Whether the student has Arts or Science as a subject choice their anxiety and stress level in toady’s times of tough competition is the same.

The anxiety faced on giving a test, worrying about the results or else the pressures felt due to the high stressors of daily life are same for the adolescents regardless of the subject choice that they make. However, the Science subjects show higher achievement motivation, which could be a result of their focused goal of wanting to clear their entrances after completing their twelfth.

**Analysis of the interrelation among state anxiety, trait anxiety, test anxiety, stress, negative mood regulation, achievement motivation and self-esteem**

There is a high correlation seen among all the dependent variables used in this study. A positive high correlation is seen among the state anxiety, trait anxiety, test anxiety and stress measures of the female adolescent students. Thus revealing that a high test anxious student is likely
to have higher stress levels or else that those female students who have a higher trait anxiety are more likely to have higher state anxiety or stress.

The results also reveal a high negative correlation among the measures of state, trait, test anxiety, stress and that of negative mood regulation and self-esteem. An individual’s ability to regulate his mood and possess a high positive self-esteem is surely to evade or reduce his stress and anxiety to a certain level.

There was no significant relationship seen among achievement motivation and state anxiety, trait anxiety, test anxiety, stress, negative mood regulation and self-esteem. This variable has been reviewed with a lot many other variables such as success and failure, achievements already made, agency and communion, parents and child attachment, teachers role serving as the related components. Academic performance, which is viewed in the light of achievement motivation for the adolescent students, could be related to anxiety and stress but not achievement motivation.

**Analysis of the effect of yoga therapy in curtailing the state anxiety, trait anxiety, test anxiety and stress of the adolescent female students**

Yoga therapy has been effectual in curtailing the state anxiety, trait anxiety and stress of the Arts and Science adolescent female students. The yoga therapy involving pranayama, sukhsham vyam, asanas, mudras and meditation has been effective in relaxing the students such that they have shown a decrease in their state anxiety involving how they feel at that time.
Yoga therapy has also shown a decrease in their trait anxiety revealing a positive trend in which the students report of having lower levels of trait anxiety or how they generally feel. The results have also shown that yoga therapy has helped them in decreasing their general stress levels pertaining to their health, education, peers, family, personal and behavioural.

It is however seen that with regard to test anxiety only the Science students have shown a significant decrease after the yoga therapy. The Arts students have shown a decrease but this decrease is not significant.

**Analysis of the effect of yoga therapy in enhancing negative mood regulation, achievement motivation and self-esteem**

The results show a significant increase in the scores of negative mood regulation and self esteem of the Science female students only after the yoga therapy. Though an increase is seen in the scores of the Arts students for the negative mood regulation and self esteem measures the change is not significant.

The female students have been able to believe that they can regulate their negative mood more effectively after Yoga therapy. The subjects have shown a higher trend in perceiving themselves positively and being viewed positively by the others by showing an increase in their self-esteem score.

The results obtained have shown that the Science subjects have shown higher significant reduction in test anxiety and enhancement in their negative mood regulation and self esteem as compared to their Arts.
counterparts. This thus reveals that the Science subjects are more receptive to the yoga therapy given to them.

The Arts as well as Science control groups as expected, to show no significant difference in their pre to post trial scores for not being given any intervention during the one month time span have shown a significant decrease in their negative mood regulation scores. A variety of activities taking place in that one-month which could have overburdened the students did not make them show an increasing trend in their anxiety or stress but made them lower their belief about their ability of regulating their mood. It can thus be inferred that mood fluctuations are very frequent during adolescence.

With regard to the achievement motivation the results of the study reveal that yoga therapy has been ineffectual in enhancing the subjects achievement motivation. Previously it has been seen that achievement motivation has not shown any correlation with the other dependent variables in this study. Thus revealing that yoga has not been able to enhance the drives, need or motive to achieve in the adolescent students. Though there has been reported evidence of students showing improvement in their performance due to yoga therapy, which could be associated to achievement motivation.
MAIN FINDINGS OF THE STUDY

The Arts and Science female adolescent students have not shown any difference on measures of state anxiety, trait anxiety, test anxiety, stress, negative mood regulation and self-esteem. They have revealed a significant difference only with regard to the achievement motivation scale. Higher achievement motivation is seen among the Science subjects as compared to their Arts counterparts. All the dependent variables, state anxiety, trait anxiety, test anxiety, stress, negative mood regulation and self-esteem significantly correlate with each other. The only variable, which has not shown any relation with the other variables, is the achievement motivation scale.

The treatment and control groups differ significantly as a result of the yoga therapy intervention as revealed by the significant post adjusted F value through analysis of covariance. Significant pre to post score differences are revealed after the yoga therapy intervention on state anxiety, trait anxiety, and stress among the Arts and Science treatment groups. Whereas significant pre to post scores differences are revealed only for the Science subjects and not for the Arts treatment group subjects, after the yoga therapy intervention on test anxiety, negative mood regulation and self-esteem. No significant pre to post changes have been seen for the achievement motivation scale after the yoga therapy intervention for Arts as well as Science treatment groups.

Yoga therapy has been effective in curtailing the state anxiety, trait anxiety, and stress of all the subjects undertaken, and has been partially effective for fifty percent of the treatment subjects, in curtailing their test anxiety and enhancing their negative mood regulation and self-esteem. However Yoga therapy has not shown any efficacious results for achievement motivation.