CHAPTER 3
METHODOLOGY, DATA COLLECTION AND DATA ANALYSIS

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CHAPTER 3
METHODOLOGY

The methodology section deals with the statement of problems, objectives of study, variables, operational definitions of terms used, design of study, the sample used in this study, hypotheses involved, tools used, and lastly, data collection, procession, and analysis of results.

3. METHODOLOGY
3.1 Objectives of Study:
The objectives of the study were as follows:

3.1.1 To examine the difference in adolescent stress along grades.
3.1.2 To examine the difference in adolescent stress along gender.
3.1.3 To study a relation between adolescent stress and the school environment.
3.1.4 To study a relation between adolescent stress and the home environment.

3.2 Research Design: Co-relational research design was used for this study (Kumar, 2005).

3.3 Variables under Study:
The variables were as follows (Kumar, 2005; Aron et al., 2006):

3.3.1 Adolescent Stress
3.3.2 School Environment
3.3.3 Home Environment
3.3.4 Consideration of demographic variables: Grades IX and XI; Genders Female and Male;

3.4 Operational Definitions:
The operational definitions were as follows:

3.4.1 Adolescence: In one’s life span the period between 12 to 18 years is termed adolescence. This is a transition period; ending of childhood and beginning of early adulthood.

3.4.2 Stress: A state of emotional, behavioural and physiological strain which imposes demands for adjustment upon adolescent students.

3.4.3 Adolescent Stress: A person in the stage of adolescence who is required to respond to stimuli or pressures of emotional, behavioural and physiological strain, and the ability to adapt or cope with these pressures; to measure dimensions namely, the stress of home life, school performance, school attendance, relationships, peer
pressure, teacher interaction, future uncertainty, school and leisure conflict, financial pressure and lastly emerging adult responsibility.

3.4.4 Grade: An educational year is a grade.

3.4.5 Gender: A term used for Female and Male genders.

3.4.4 School Environment: It is the psycho-social environment in the school encompassing components namely, Creative Stimulation, Cognitive Encouragement, Acceptance, Permissiveness, Rejection, and Control.

3.4.5 Home Environment: It is the environment at home comprising of dimensions namely, Control, Protectiveness, Punishment, Conformity, Social Isolation, Reward, Deprivation of Privileges, Nurturance, Rejection, and Permissiveness.

3.5 Hypotheses:
The Hypotheses, as derived from the literature review, were as follows:

3.5.1 Adolescent Stress would be significantly higher for Grade XI students as compared to Grade IX students.

3.5.2 Adolescent Stress would be significantly higher for Female students as compared to Male students.

3.5.3 There would be a significant positive correlation between Adolescent Stress and School Environment.

3.5.4 There would be a significant positive correlation between Adolescent Stress and Home Environment.

3.6 Sampling Procedure:

3.6.1 Stratified random sampling method was used for this study. The student population for this study was taken from the city of Aurangabad, Maharashtra, India. A student population of Grades IX and XI was chosen because these students would be appearing for a Board Exam the following year (in Grades X and XII respectively). Schools and colleges were identified from the city of Aurangabad. Proportionate geographical stratified sampling was done based on a map of Aurangabad (Appendix G) and dividing it into four parts, namely North, South, East and West. Schools were identified in each of the four parts (five schools from each part of Aurangabad). Twenty schools in all were approached with letters and several follow-up phone calls. Finally, six English-speaking medium schools agreed to participate in this study. Three schools were under State Board (Saraswati Bhavan School, Deogiri College and Shivaji Chattrapati College; two schools were under the CBSE Board (Stepping Stones
and Nath Valley School); and one school was under the ICSE Board (Poddar International).

3.6.2 The sample of this study constituted 620 students with a break-up as follows: In all, 353 students attempted the four inventories from Grade IX (156 Females and 197 Males) with a mean age of 13.89; and 267 students attempted the four inventories from Grade XI (136 Females and 131 Males) with a mean age of 15.96.

3.7 Tools:
The tools used were as follows:

3.7.1 Adolescent Stress Questionnaire (ASQ) (Byrne, Davenport & Mazanov, 2007):
The ASQ is a broadly based instrument which allows adolescents to report their own exposure to a wide span of stressors and to report, as well, the extent to which any stressor experience has constituted a psychological challenge for them as individuals. The 10 dimensions reflect adolescent stress, which are qualitatively consistent with the contemporary literature on the stressfulness of adolescence (Byrne et al., 2007). The ASQ has one scale, a 5-point Likert type scale from (1=Not at all stressful (or is irrelevant to me); 2=A little stressful; 3=Moderately stressful; 4=Quite stressful; and 5=Very stressful) was used for scoring., with 58 items belonging to 10 dimensions namely: Stress of Home Life, Stress of School Performance, Stress of School Attendance, Stress of Romantic Relationships, Stress of Peer Pressure, Stress of Teacher Interaction, Stress of Future Uncertainty, Stress of School/Leisure Conflict, Stress of Financial Pressure, Stress of Emerging Adult Responsibility. The minimum possible score is 0 point and the maximum possible score is 296 point. Approximately 25 minutes is required to attempt this inventory.

Test-retest reliability over a single week time period showed correlations ranged between 0.68 (Stress of Financial Pressure) and 0.88 (Stress of Home Life). Three criterion measures (anxiety, depression and self-esteem) correlated strongly and in the expected directions with one another showing concurrent criterion validity of the ASQ. The instrument shows good reliability both internally and across repeat testing.

The researcher has conducted a pilot study to check the relevancy of the contents in the test, to check language difficulty, understanding of contents and timing, from four different schools from each of the four areas on the map of Aurangabad. This was conducted on 20 participants; 10 from Grade IX and 10 from Grade XI. Participants were able to understand the questionnaire well and attempted the ASQ without any
problem. It was felt that since participants did not have a problem attempting the ASQ, a further adaptation of the test would not be required.

3.7.2 Adolescent Life Events Stress Scale (ALESS) (Aggarwal et al., 2007):
The 41 item-containing adolescent life event stress scale based on Holmes and Rahe's (1967) - social readjustment rating scale and student stress scale (DeMeuse, 1985) was administered to the students by the investigators using an ‘independent’ measure. The ALESS was administered to 156 adolescents for formulation and 102 adolescents for validation. A third set of 112 adolescents was used to compare ALESS scores with child behavior checklist scores and parental stress scores due to life events or life-change. Life-change unit scores are used in this study; one composite score could be safely calculated. The minimum possible score is 0 point and the maximum possible score is 1353 points. Approximately 15 minutes is required to attempt this inventory.

The comparison showed a strong positive correlation with Child Behaviour Check List (Achenbach, 1983 - CBCL) scores, a model fit of \( r^2 = 0.32 \) and an ability to predict the CBCL scores (above cutoff value) using the stress scores = 37.5 + 0.05; and a weak positive correlation with parental stress (Pearson's coefficient = 0.011) due to life events.

The researchers (Agarwal et al., 2007) found Cronbach's alpha for all domains in excellent range except for the relocation domain for which it was in the fair to good range. Thus, the instrument is satisfactorily valid.

3.7.3 School Environment Inventory (SEI) (Mishra, 2002):
The School Environment Inventory (SEI) is an instrument designed to measure the psycho-social environment of schools perceived by the students. It provides a measure of the quality and quantity of the cognitive, emotional and social support that has been available to the students during their school life in terms of teacher-pupil interactions. The SEI can be used to appraise the perceptions of students, and to measure the quality of the learning environment that pervades the classroom. The SEI has one scale with 70 items belonging to six dimensions of the school environment – Creative Stimulation, Cognitive Encouragement, Permissiveness, Acceptance, Rejection and Control. The instrument requires individuals to tell the frequency with which a particular teacher - student interaction or behaviour is expressed in his or her school. They had to assign 4 marks to ‘Always’, 3 marks to ‘Often’, 2 marks to ‘Sometimes’ and 1 mark to ‘Rarely’ and zero to no responses. The minimum possible score is 0
point and the maximum possible score is 395 points. Approximately 25 – 30 minutes is required to attempt this inventory.

The split-half reliabilities for various dimensions of the school environment ranged between .67 and .92. The scale inter-correlations for SEI scores were between -.01 to .77. Examination of the SEI revealed that a composite score can be safely calculated. The SEI possesses content validity as measured with the help of views expressed by judges; criterion-related validity could not be established. Thus, the instrument is satisfactorily valid.

3.7.4 Home Environment Inventory (HEI) (Mishra, 2003):

The Home Environment Inventory (HEI) is an instrument designed to measure the psycho-social environment of home as perceived by children. It provides a measure of the quality and quantity of cognitive, emotional and social support that has been available to the child within the home environment.

The instrument requires students to tell the frequency – multiple choice type items - with which a particular parent-child interaction behaviour has been observed by them in their homes, that is, he/she is requested to tell whether a particular parental behaviour (as mentioned in the item) occurs – ‘mostly’, ‘often’, ‘sometimes’, ‘least’, and ‘never’. The HEI has one scale with 100 items belonging to ten dimensions – Control, Protectiveness, Punishment, Conformity, Social Isolation, Reward, Deprivation of Privileges, Nurturance, Rejection and Permissiveness. There are 5 cells where frequency of occurrence of a particular behaviour had to be given. The individual had to assign 4 marks to ‘mostly’, 3 marks to ‘often’, 2 marks to ‘sometimes’ 1 mark to ‘least’ and, 0 marks to ‘never’ responses. The minimum possible score is 0 point and the maximum possible score is 395 points. Approximately 25 – 30 minutes is required to attempt this inventory.

Split half reliabilities (corrected for length) were worked out separately for all the ten dimensions and ranged from .73 to .95. Inter-correlations among HEI scales were between -.04 to .88. Observations show that eight coefficients of correlations are moderate/high. One composite score could be safely calculated. The HEI possesses content validity as measured with the help of views expressed by judges. Criterion related validity could not be established because of the lack of appropriate external criteria. Thus, the instrument is satisfactorily valid.
3.8 Data Collection:

3.8.1 The standard procedure of collection of data was done. Data was collected from a cross section of students from six different schools and colleges in the city of Aurangabad, in the form of questionnaires. High schools and secondary colleges in both sectors are largely autonomous for administrative purposes and so invitations (Appendix F), to participate were sent to those selected (in sampling procedure), to reflect a broad socio-demographic spread of the population (Appendix E).

3.8.2 Questionnaire administration was conducted in whole class groups during class time and fully supervised; so far as possible, this was undertaken at the same time for all classes participating within a single school (to avoid the possibility of collusive responses). This was done by the researcher alone, in calm, quiet surroundings.

3.8.3 All standard procedures of test administration was maintained, data was collected over a period of two to two-and-a-half hours in each school. It took the researcher approximately three months (between June to September 2010) to finish the data collection.

3.8.4 The objectives and relevance of the study was explained to respondents in all schools, in simple terms. Respondents were willing to share information. The respondents read the statements, interpreted what was expected and then wrote down the answers or ticked statements accordingly. The statements themselves were clear and easy to understand. The researcher was present and answered any queries that arose during the administration of the questionnaire. The name, age and sex of each participant were taken on the front page of all four inventories namely the ASQ (Appendix A), ALESS (Appendix B), SEI (Appendix C) and HEI (Appendix D).

3.8.5 The layout of the questionnaire was such that it was easy to read and pleasant to the eye; the sequence of questions was easy to follow. The questionnaire was developed in an interactive style i.e. the respondents would feel that someone was talking to them. Any sensitive questions were dealt with by the researcher on the spot. There were no major problems that occurred during this session. All measures were computed and the results were analysed using SPSS 17.0.

3.8.6 Oddities or difficulties encountered: One area of difficulty that arose was getting more schools to agree to participate in the study. Twenty schools (five schools from each of the four areas of the map of Aurangabad) (Appendix G) were approached with letters and phone calls. Six schools responded from this cluster. The Principal of one school was unavailable to speak to or un-contactable and the basic message given by
their secretary was that they were not interested! This was stated without even knowing the purpose of the study, or the reason for the phone call!

The following shows the number of students that attempted the:

- ASQ inventory: 605 students
- ALESS inventory: 600 students
- SEI inventory: 620 students
- HEI inventory: 620 students

**3.9 Procedure for Data Processing:**

**3.9.1 Editing:** The first step in processing the data was to ensure that the data is ‘clean’ - that is free from inconsistencies and incompleteness. It was not possible to go back to the respondents in the case of missing data, particularly from the ALESS and ASQ questionnaires, as schools and colleges were not able to reschedule another testing session just for missing answers as their school schedules were very tight already!

**3.9.2 Coding:** Having cleaned the data, the next step was to code it. All respondents were given serial numbers from 1 to 620. Data from each booklet was coded quantitatively/categorically in the form of numerical codes, so that the information could be analysed by a computer; SPSS 17.0 was used in this analysis. A fixed format of coding was used wherein the piece of information obtained from a respondent was entered in a specific column. Each column has a number/title and the information is entered in a row comprising these columns. Each row relates to information on a particular respondent. Hence a code book was developed for each test and each respondent. There were no open-ended questions to decipher in this study.

For the ASQ, ALESS, SEI and HEI serial numbers 1,2,3,4, etc were coded; each student’s name was represented by a code number from 1 to 620; each student’s age was represented by the original number; female was represented by F1 and Male was represented by M2; Grade IX was represented by the figure 1 and Grade XI was represented by the figure 2. Each school that a student went to was represented by a code number, for example, Saraswati Bhavan School 1, Deogiri College 2, Shivaji Chattrapati College 3, Poddar International 4, Stepping Stones 5, and Nath Valley School 6.

**3.9.3 Scoring:** The researcher followed the manual while scoring the data entries. The ASQ had 10 dimensions, the ALESS had 40 items, the SEI had 6 dimensions and the HEI had 10 dimensions.

The scoring for the ASQ was entered for each student individually into the computer. There were five areas ranging from ‘No Stress, Almost Stressed, Medium Stress, Quite
Stressed and Very Stressed’. Individual total and five separate totals were added up. These scores were fed into a computer for further analysis. The ALESS had a series of about 40 items with each item having a predetermined score attached to it. Depending on which statements were ticked by each student, the scores were collated with a final unit score being given for each student. The lowest score on this test being ‘0’ and the highest score being ‘1354’.

For the SEI raw scores were obtained which were then transferred into stanine scores as per the SEI stanine scores. These scores were fed into a computer for further analysis.

For the HEI raw scores were calculated for each of the above areas and totals were done. This was fed into a computer into excel sheets for further analysis.

3.9.4 Recording: All scores and information was done precisely for each student by feeding in the information into a computer. This took a few months but the end result was extremely satisfactory.

3.9.5 Checking: All scores and entries were cross-checked to ensure absolute accuracy in the final analysis.

3.10 Procedure for Data Analysis: Data was entered on Excel sheets. Both Classes IX and XI data was entered in separate books of Microsoft Excel. Analysis was done along the Hypotheses. The data was checked for normality (Skewness, Minimum scores and Maximum scores); Means, SDs, t-test values and Pearson’s correlation were computed using SPSS 17.0 for Windows. Responses to certain statements that were left out by the student’s were not included.

The analysis of the scores for the ASQ, ALESS, SEI and HEI was done by obtaining the Mean and Standard Deviation, the scores t-test for independent samples and Pearson’s Correlation Coefficient was computed between the scores for the ASQ and SEI, ASQ and HEI; between the scores for the ASQ and HEI, ASQ and HEI.

3.11 Summary:

The objectives of the present study were to examine the difference in Adolescent Stress as related to Grades (IX and XI) and Genders (Female and Male); to find a correlation between Adolescent Stress and the School and Home Environments. A correlational research design was used. The variables included Adolescent Stress, School Environment, Home Environment and demographic variables such as Grade and Gender. Operational definitions included Adolescence, Stress, Adolescent Stress, Grade, Gender, School Environment and Home Environment. Four hypotheses were
derived from the literature; these were: Adolescent stress would be significantly higher for Grade XI students as compared to Grade IX students; Adolescent stress would be significantly higher for female students as compared to Male students; There would be a significant positive correlation between Adolescent Stress and School Environment; There would be a significant positive correlation between Adolescent Stress and Home Environment. A stratified sampling method was used. 620 students took part in the study from five different schools from the city of Aurangabad. In all, 353 students attempted the four inventories from Grade IX (156 Females and 197 Males) with a mean age of 13.89; and 267 students attempted the four inventories from Grade XI (136 Females and 131 Males) with a mean age of 15.96. The tools used in the study were the Adolescent Stress Questionnaire, the Adolescent Life Events Stress Scale, the School Environment Inventory and the Home Environment Inventory. A standard procedure for data collection and data processing was done. Data analysis included Means, Standard Deviations, t-test values and Pearson’s Correlation Coefficient. SPSS 17.0 for Windows was used in this study.