3

METHODOLOGY

The research design pertaining to the current study "Efficacy of Stress Inoculation Training (SIT) in improving the overall well – being of school students" was a combination of two research designs as given below

1. **Survey research** – used to assess the level of stress and its repercussions among the school children

2. **Field experiment** – to analyze the effectiveness of Stress Inoculation Training (SIT) on the level of stress and its repercussions and also to adjudge its retention potential in terms of resilience, stress coping repertoires and academic performance. This design was different from the classic controlled experimental design in one way that the subjects were not randomly assigned to either the experimental and control group. Instead the lottery method was adopted to decide which group would undergo the intervention.

The methodology pertaining to the current study was briefed under the following heads.

A. Population and sampling
B. Construction of the tools
C. Conduct of the study
D. Analysis of data

A. POPULATION AND SAMPLING

Sampling is the process of selecting units (e.g. people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (Trochim, 2006).

The study was conducted in Coimbatore city of Tamilnadu. Coimbatore is the second largest city and san urban agglomeration state of Tamil Nadu after Chennai. It is one of the fastest growing Tier - II cities in India and a major textile, industrial, commercial, educational, information technology, healthcare and manufacturing hub of Tamil Nadu (https://en.wikipedia.org). This dynamic feature of Coimbatore forces both the parents working culture. According to the Census report (2011), the share of married couple families in Coimbatore, where both parents of children between 10 - 15 years work edged up to 62.9 per cent. As both the parents start working their children at this age of turbulence do not get enough or effective guidance to deal with their day - to - day challenges. Therefore Coimbatore was selected as the area of study.

However, in order to generalize the results, multistage sampling procedure was adopted and was carried out in three stages namely

Stage 1: Selection of schools

Stage 2: Selection of population sample

Stage 3: Selection of experimental and control group

The Figure 2 provide a clear picture of the three stages of multistage sampling with reference to the selection of schools and respondents both for survey research and field experiment research.

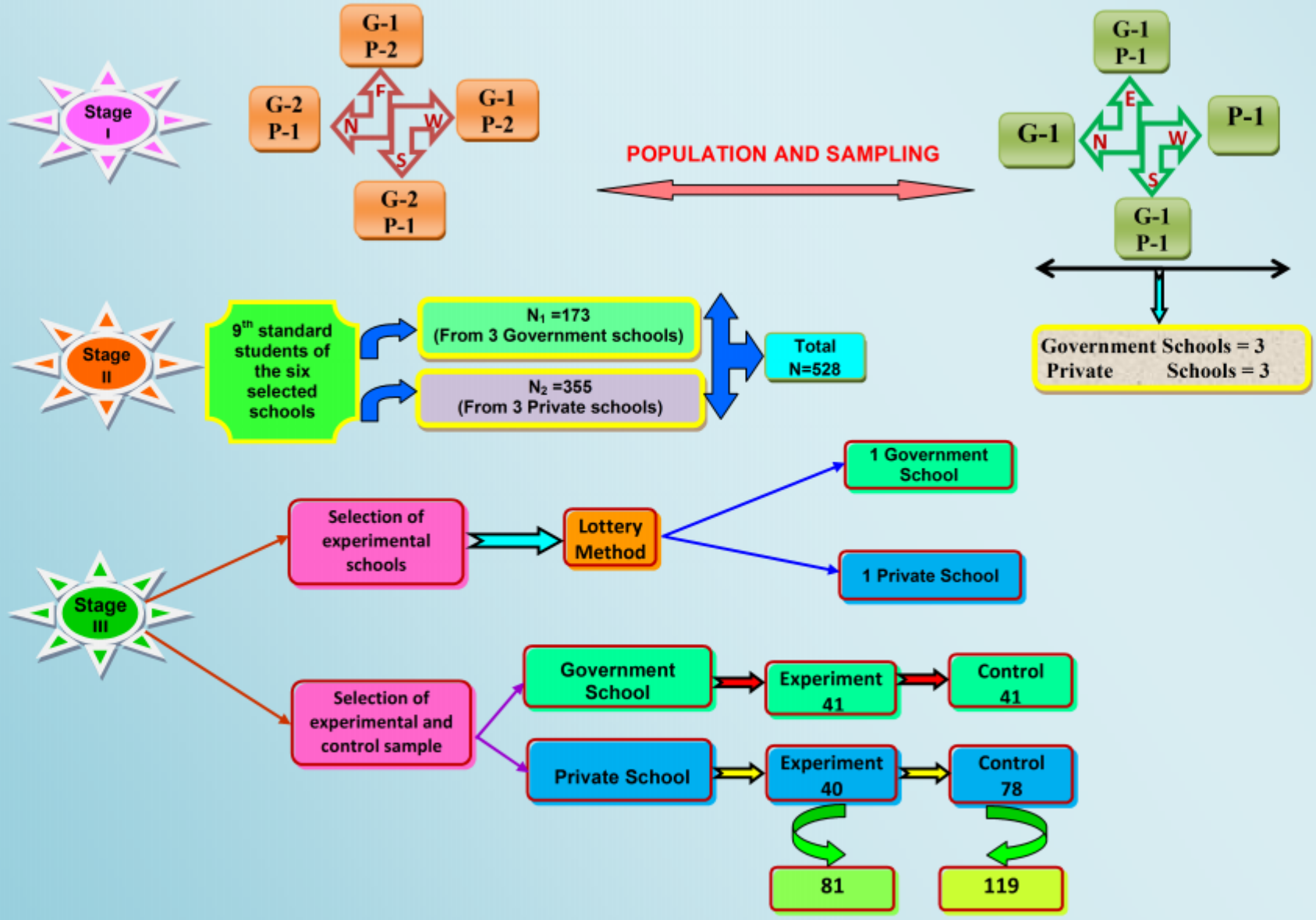

Stage I
G-1 P-2
G-2 P-1
G-1 P-2
G-2 P-1
F
N
W
S
POPULATION AND SAMPLING
G-1 P-1
G-1
P-1
G-1 P-1
E
N
W
S
G-1 P-1
Stage II
9th standard students of the six selected schools
N1 =173 (From 3 Government schools)
N2 =355 (From 3 Private schools)
Total N=528
Government Schools = 3
Private Schools = 3
Stage III
Selection of experimental schools
Lottery Method
1 Government School
1 Private School
Selection of experimental and control sample
Government School
Experiment 41
Control 41
Private School
Experiment 40
Control 78
81
119

FIGURE 2

Stage 1 : Selection of schools

Initially 12 schools administrated both by the state government as well as private organization in and around Coimbatore with a radius of 5 - 15 kilometers were shortlisted from the four zones (north, east, west and south) accounting to three schools in each zone. In order to ensure homogeneity the research set criteria to identify and select these 12 schools. The inclusion criteria were

- ***Location of the schools*** - The schools should be 5 - 15 kilometers from the heart of the Coimbatore city. The reason behind setting this criteria was that, the schools located within 5 kilometers come under the corporate limit. As the environment of the urban and rural sector would for sure exhibit differences that in turn could alter the stress level, the cent percent urban limit was excluded from the study.

- ***Type of syllabi offered*** - The three main patterns of syllabus followed in Tamilnadu education system are The Indian Certificate of Secondary Education (ICSE), The Central Board of Secondary Education (CBSE) and Samacheer pattern. As the different school environment would pose different challenges to the students, and in order to ensure homogeneity the inclusion criteria covered only schools offering Samacheer pattern of syllabus.

- ***Type of school*** - In order to uphold homogeneity and to reduce bias all the shortlisted schools were higher secondary schools in both government and private administration.

Thereby, the schools selected by multistage sampling comprised of both government and private schools totalling to 12 schools. However, when approached for their willingness and cooperation, the administration of only six schools granted approval to be a part of the research. So all these six schools were selected for the preliminary data collection which comprised of three government and three private schools distributed among the four zones of Coimbatore.

Stage 2 : Selection of the population sample

The rationale behind the present research was to design a need - based individually tailored Stress Inoculation Training Programme and find out its impact in reducing the stress levels and its related repercussions and thereby improving the overall well – being of high school students.

As the Indian educational system compels every student to undergo public exams at 10^{th} and 12^{th} standard for which the preparation starts during their 9^{th} standard itself, the stress coping and its management strategies should be learnt before stepping onto the 10^{th} grade. Hence the present study had its focus on the 9^{th} grade students as these adolescents will be facing gung ho public exams shortly. Added to the credescence an extensive Associated Press / MTV survey also shows that young people aged fifteen years experience stress at a high rate (nbcnews.com). Therefore thirteen to fifteen years of age was considered to be the right time to inoculate every school child against the dreadful disease called "stress".

Therefore, the respondents for the present study comprised of all 9^{th} standard school students from all of the six schools selected, accounting to 173 government school students (N_1) and 355 private school students (N_2) totalling to 528 students as population sample (N=528). Appendix - I give a detailed view of the population sample of the present research.

Stage 3 : Selection of the experimental and control group

The third stage of multistage sampling involves the identification of the experimental and control group, to conduct the proposed SIT, which was again done in two sub stages as discussed below.

i) Selection of schools for intervention - Though six schools (government and private - 3 each) extended their full cooperation, the SIT programme has got its own mega schedule of activities. So the investigator confined the intervention only with two schools, so that an in - depth could be brought out. Hence two schools were selected using the lottery method

from the identified six schools. The first slip picked up in both the categories (government and private) was considered to be the experimental school. Accordingly one government and one private school were identified for SIT.

ii) *Selection of Experimental and Control group of respondents* - The schools identified for the intervention had 200 respondents in total (Government School n_1 = 82, and Private school n_2 = 118) which was a huge number for the intervention programme. Thereby by means of lottery method again, only one section of the 9th standard were considered as the experimental group in both the Government and the Private school. The other sections constituted the control group in order to decrease the bias.

Hence, the experimental group of school students from each class accounted to a total of 41 from government school and 40 from private school (a total of 81 students). The control group from rest of the classes accounted to a total of 41 from government school and 78 from private school (a total of 119 students). The detailed sorting out the schools and respondents in terms of experimental and control group was given in Appendix - II.

Ethical Consideration

As a matter of ethics, the students (supposed to be the respondents) and their parents were informed about the research through a simple and clear consent form. The research participants were given the freedom to make an informed decision of whether to participate in the research. However all the students with whom the investigator requested for their consent cooperated.

The present study was also subjected to Institutional Human Ethical Committee and was approved for the same (Approval Number – AUW/IHEC - 14-15/XMT-32).

B. CONSTRUCTION OF THE TOOLS

The present study called for the development of the following tools to be administered to the school students to secure adequate information regarding their stress and its repercussions.

i. Questionnaire to elicit the general background
ii. Checklist to assess the stress level and identify the causative factors
iii. Stress indicator checklist
iv. Indicators on overall well – being of school students
v. Feedback from the student subjects

i) Questionnaire to elicit the general background

The investigator used the questionnaire as a tool for the collection of the general and personal profile of the students with relevance to age, sex, type of family, and the family background as in Appendix- III.

ii) Checklist to assess the stress level and identify the causative factors

As locally suitable relevant scales for assessing the level of stress among students of this particular age were not available, an appropriate situation based checklist was developed (Appendix - IV) after detailed review of literature and in consultation with experts. The check list was carefully formulated in such a way that it gives two important measures relevant to the study pursued.

a. Stress level of the selected students
b. The causative factors of stress among these students

a. Stress level of the selected students

This checklist had a total of 75 items. The mode of response to each of the item was in the form of a forced choice (i.e.) either 'yes' or 'no', indicating complete agreement or disagreement with the proposed statement. For the items numbered 54, 62, 64, 72, 73 the response 'yes' was indicative of no stress and 'no' for the presence of stress. For the remaining items, 'yes' provided clue for the presence of stress and 'no' for its absence. For scoring,

one mark was provided for the response indicating the presence of stress and zero for its absence. The checklist gives the total stress score based on which the levels of stress in students were divided into low, moderate and high. The Table – III presents the categorisation of the stress levels of the school students with regard to the total scored.

TABLE - III

GRADING THE LEVEL OF STRESS AMONG STUDENTS

Level of stress	Range of scores
Low	0-25
Moderate	25-50
High	51-75

b. The causative factors of stress among these children

By thorough review of literature and informal chat of the investigator with the parents, teachers and the students identified for the study, seven causative factors triggering stress were recognized in common. They were teacher, money, attitude and feelings, school work, exam, parents and friends.

The above said checklist was formed in such a way that the response identifies the stress causing factors that were being perceived as stressors by the selected students. The total of 75 items was categorized into seven common factors as specified above. The numbers of items distributed among the seven factors is depicted in Table – IV.

TABLE - IV

CATEGORATION OF ITEMS UNDER EACH CAUSATIVE FACTOR

S.No	Causative factors	Item No.	Total items
1.	Teacher	7,13,15,17,18,19,21,24,26,33,34,41,62	13
2.	Money	2,51,52,53,69,70,71,72,73	9
3.	Attitudes and Feelings	11,25,40,42,44,46,54,59,60,65,66,74	12
4.	School work	1,3,4,5,6,10,20,29,30,31,32,50	12
5.	Exam	8,9,22,27,28,43,45,48,49,57,58,	11
6.	Parents	12,16,23,35,37,39,55,61,67,75	10
7.	Friends	14,36,38,47,56,63,64,68	8

The scores were summed up for each factor and subjected to analysis in order to find out the order of prominence of the factors associated with the increased stress level of the selected school students.

iii) Stress indicator checklist

Increased level of stress among school students had been indicated through their different type of the signs and symptoms they experience and in turn manifested in their behaviour. Normally stress gets associated with physiological, behavioural and mental indicators. Hence a stress indicator checklist of 50 items (Appendix - V) that could gauge the signs and symptoms experienced by the selected students was framed. Each item was scaled as 1 (yes) and 0 (no). The total of 50 items were divided into three dimensions of stress indicators (physiological - 17 items; behavioural items - 15 and mental - 18 items). A total score was obtained from summing up of scores for each dimension and were compared for further analysis. The Table - V presents the classification of the level of stress indicator with reference to the total score on physiological, behavioural and mental indicators experienced by the students due to stress.

TABLE – V

GRADING THE INDICATORS OF STRESS

Level of stress indicator	Range of scores
Low	0-17
Moderate	18-34
High	35-50

Tool standardization

Validation

The framed statements of the tool mentioned above were scrutinized to look at the operationalization and to check whether 'on its face'. The statements appeared to measure the level of stress and identify the causative factors. Also the tool on stress indicator was subjected to face validation and it was found to measure the indicators of stress.

Both of these tools were also subjected to content validation. Five subject experts from the field of Education, Psychology and Human Development were identified to scrutinize the developed tool. The suggestions put forth by the experts were incorporated and the final version of the tool was developed.

Pilot study

The tool after content validation was subjected to translation into regional language to be used by the students of the government school. Then a pilot study on 10 students from government schools (Tamil version of the checklist) and 10 students from private schools (English version of the checklist) was carried out to gain insight on the difficulty in comprehension and phrasing of the statements. Statements which were found to be difficult to comprehend were reworded / rephrased.

Reliability

Three measures of reliability namely Spearman - Brown, Guttman and Cronbach's alpha were given to test the reliability of the check list to assess the

stress level of school students and the check list on stress indicators. The reliability of the stress level checklist was found to be between 0.74 and 0.83 which makes the constructed checklist fairly reliable. Whereas, the reliability of the stress indicator checklist was between 0.89 and 0.92 which also marks the constructed scale as fairly reliable.

iv. Indicators on overall well – being of school students

According to Angner (2008), even the philosophical literature refers to the 'simple notion' of well – being (i.e 'a life going well) in a variety of ways, including a person's good, benefit, advantage, interest, prudential value, welfare, happiness, flourishing, utility, quality of life and thriving. The present study gauges the overall well – being of the student population by means of three indicators namely resilience covering seven dimensions, stress coping repertoires and academic performance as per their marks scored in exams.

These indicators were used only with the experimental and control group of respondents both prior and six months after SIT. One reason for providing the overall well – being tools after six months of SIT was to find out the retention potential of the SIT intervention as the stress level and stress indicator checklist could gauge the effect of SIT immediately after intervention. The three overall well – being indicators and the data collection procedure were as explained below.

a. Checklist on Resilience

Resilience is defined as an individual's capacity to effectively adapt to stressful situations. It is the ability to cope with stress. The process of Stress Inoculation Training enhances resilience by training the students with both problem - focused and emotion - focused coping strategies and thereby broadly controlling the early life stress. So a checklist to appraise the resilience of the experimental group was formulated and was administered to them just before the implementation of SIT and six months post SIT.

The Resilience Checklist of 20 items (Appendix - VI) that could measure the resilience exhibited by the selected students was framed. Each item was

scaled as 1 (yes) and 0 (no). The Resilience checklist of 20 items was divided into its seven dimensions namely vision, determination, interaction, relationships, problem solving, organization and self confidence. The categorisation of items under each head was as projected in the Table - VI. A total score was obtained from summing up of scores for each dimension and were compared for further analysis.

TABLE – VI

DIMENSIONS OF RESILIENCE

S.No	Items	Item No.	Total items
1.	Vision	1,7	2
2.	Determination	8, 12, 18	3
3.	Interaction	2, 13	2
4.	Relationships	3,9,14,15	4
5.	Problem solving	4,10,19	3
6.	Organization	5,16,20	3
7.	Self-confidence	6,11,17	3

b. Checklist on Stress Coping Repertoires

Stress coping repertoires is the entire range of skills or aptitude. It is expending conscious effort to solve personal and interpersonal problems, and seeking to master, minimize or tolerate stress (http://en.wikipedia.org). One concept found in the coping literature that bears relevance to the current development of coping repertoire is the concept of coping flexibility.

Coping flexibility as defined by Cheng (2001) measures the extent to which individuals successfully engage coping strategies in controllable stressful situations and uncontrollable stressful situations. As Stress Inoculation Training helps individuals perceive stressors as more familiar, more predictable, and more controllable – which in turn reduces the stress response they experience, the investigator hoped to measure the coping flexibility of the trainees.

Hence a checklist on stress coping repertoires that had 30 questions with each statement indicating a positive strategy to cope with stress was formulated (Appendix VII) and the scores were summed across and used for further analysis. Each item was scaled as 1 (yes) and 0 (no). This checklist just like checklist on Resilience was administered just before the implementation of SIT and six months post SIT to the experimental lot of students.

c. Likert Scale on Academic performance of the students

Good academic performance or even a slight improvement in it brings immense joy to the student as well as to their parents and teachers. Bearing this verity in mind, the investigator wanted to compare the academic performance in relation to the SIT intervention. The academic performance of the selected students was rated with a four point rating scale as addressed in Appendix – VIII. The scale ranged from one used to represent below average performance to four used to represent excellent performance. The total marks of the respondents were converted to percentages and were categorized and rated into below average – less than or equal to 40 per cent; average – 40 to 60 per cent; good - 60 to 80 per cent and excellent – above 80 per cent.

The report card grades were considered as a tool for academic performance for two reasons. One was that the report cards allow teachers to account on the classroom academic performance and the second reason was that it was with this card the students were evaluated on a similar standardized grading system with uniform subjects as both the experimental schools fulfil the inclusion criteria of the syllabus pattern - Samacheer. It should also be noted that this particular data was obtained from the secondary source i.e., the record available with the class teachers of the respondents.

The academic performance in terms of total marks converted into percentages was procured from the half - yearly marks of the experimental and control group of students conducted during the month of December of the student year (i.e. before SIT) as prior data. Then the mark of the annual exam conducted during the month of April of the next calendar year was considered as the post – I

data. The marks of the quarterly exam conducted during the month of September for their next grade (i.e.) 10th standard were assessed as post - 2 data. The comparison of pre and post data on all these three overall well – being indicators speaks about the impact of SIT in terms of retention potential among the selected student sample. However the 2nd post assessment data on the marks procured checked the consistency of their academic improvement.

v. Feedback from the student subjects

Feedback form for students (Appendix - IX) who underwent the intervention was designed to obtain information about their general opinion on the SIT intervention and the impact it has made on them.

C. CONDUCT OF THE STUDY

The study was conducted in phases as described below

Phase - I - Establishing rapport

Before launching the study, efforts had been made to establish rapport with the administrative personnel of all the six schools and the school students. The parents of these students were also informed about the significance of the study and permission to collect data from their ward was sought. Then after ensuring the complete cooperation from the administrators, principals and teachers the study was conducted. The students were convinced for their benevolence by spending considerable time being seen by them as a familiar person through icebreaking sessions.

Phase II - Collection of preliminary data

Adequate data was collected from the entire population sample of all the identified six schools through the tool selected for the purpose of identifying the stress levels of high school students. Also the tool constructed for recognizing the nature of the indicators was administered.

Before administering the tool for the students, the respondents were made to relax. They were guaranteed of confidentiality. They were also assured that there were no right or wrong responses and asked to answer each statement

presented to them as honestly as possible. The researcher clarified the doubts of the students if any raised. They were then asked to tick the most appropriate response according to them for each statement presented. No time frame for the completion of the inventory was given. However the students were encouraged to work continuously and complete the inventory as quickly as possible.

Phase III - Collection of data from the Experimental and control group of the sample

Before initiating the intervention and after identifying the experimental and control group, the checklist on resilience and stress coping repertoires were administered to both the experimental and control group to adjudge their seven domains of resilience and repertoires of coping skills. At the same time the marks obtained by these students during the half yearly exams conducted in the month of December (Prior SIT) were collected from the records of the school.

Phase - IV - Designing and implementing SIT

Stress Inoculation Training recognizes that stress was transitional in nature and that there was a need work on clients (student population here) to bolster and nurture flexible coping repertoires. As SIT was designed to impart skills to enhance resistance to stress by enhancing individual's coping repertoires and empowering them to use already existing coping skills, the researcher did not involve the significant others of these students namely their parents and teachers.

As the term 'inoculation' implies, this intervention was designed to impart skills to enhance resistance to stress through three stages.

- ***Conceptualization or education phase*** – to better understand the nature of stress, its triggers and effects
- ***Skill acquisition and rehearsal*** – develop and practice a repertoire of coping skills
- ***Application and follow through*** – application and generalization of learnt coping skills

BLUE PRINT OF SIT – LEARN TO MASTER STRESS

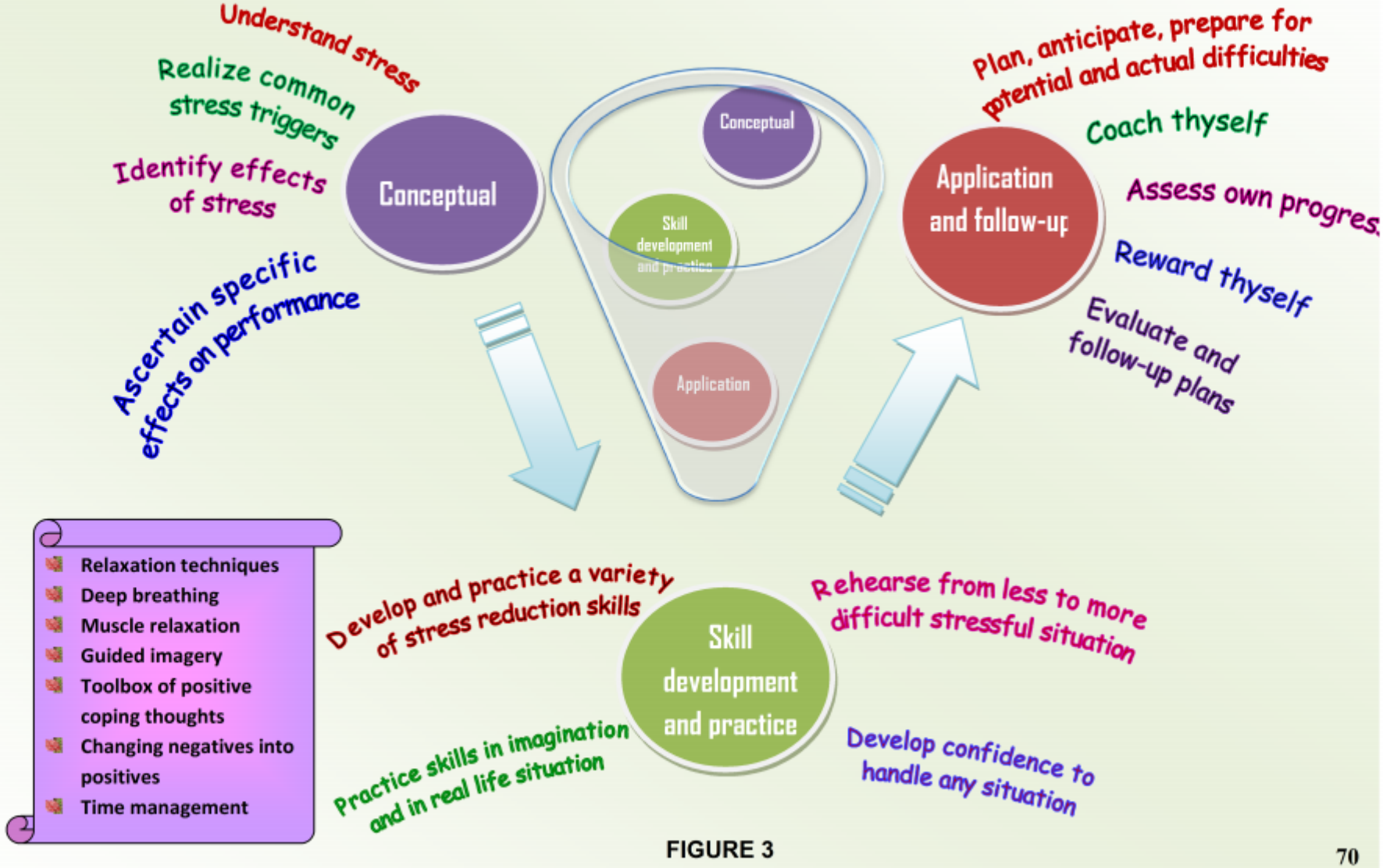


FIGURE 3

As the present study involves students for SIT, the content of the programme was formulated with the consultation of experts. Carrying over the suggestions of experts and considering the opinion of the school authorities a blue print on SIT meant exclusively for school students was designed (Figure 3). As per the blue print designed, an elaborate informational content to be covered over the three phases of SIT was framed and accordingly the sessions were conducted with the experimental group of both the schools as per the convenience of the school authorities. Accordingly during the month of February and March, the three phases of SIT was conducted and a detailed schedule with date and the content covered was enclosed in Appendix - X.

Appropriate permission was sought and the parents of all the experimental lot of children were informed of the training programme and its importance. The training programme was conducted in two batches (one in government school and the other in private school) in their own school premises. An orientation programme scheduled for one day (i.e. 6 hours) initiated the intervention wherein the students of two batches were given an orientation of what was the programme about, its importance and possible outcomes. Also they were informed about what was stress, their perceived stress level and their possible stress triggers and the signs and symptoms they experience based on the first round findings.

Following the orientation, the actual three days training programme was implemented in both the experimental government and private school. The three days training of six hours per day was conducted in both the schools as per the convenience of the school authorities.

The training session demonstrated seven coping skills namely, deep breathing, muscle relaxation, toolbox of positive coping thoughts, changing negatives into positives, guided imagery and time management. The students were facilitated to practice these skills through activities like role play, brainstorming etc. As the programme also aimed to instil confidence and motivate these children to rehearse these skills with ease, general motivation classes, confidence enhancement sessions, self awareness and empathy sessions were

organized. Rehearsal of skills was also made possible by bringing the student lot into a consultative mode wherein they explain and demonstrate the learnt skills and corrective measures were provided. The Plate I to VI depicts the photographs of students at work during the training sessions.

PLATE I

CONCEPTUALIZATION PHASE – GOVERNMENT SCHOOL

Trainer training the trainees

Investigator in action

Trainees chase for Learning

Trainees illustrating their future

PLATE II

SKILLS ACQUISITION AND REHEARSAL PHASE – GOVERNMENT SCHOOL

Trainees make and defend their choices

Trainees exploring their viewpoint

Trainees involved in a game

Trainees role playing

PLATE III

APPLICATION AND FOLLOW -THROUGH – GOVERNMENT SCHOOL

Trainees viewing their future illustration

Attentive trainees

Trainees commitment to a group effort

Confident trainees

PLATE IV

CONCEPTUALIZATION PHASE – PRIVATE SCHOOL

Trainees taking oath

Investigator helping trainees

Trainees listening attentively

Trainees planning for their future

PLATE V

SKILLS ACQUISITION AND REHEARSAL PHASE – PRIVATE SCHOOL

Trainees witnessing their near future

Role Played by trainees

Trainees motivating each other

Trainees doing outdoor activities

PLATE VI

APPLICATION AND FOLLOW -THROUGH – PRIVATE SCHOOL

Trainees giving feedback

Trainees listening to the trainer

Trainees doing group activities

Trainees in conversation

After the completion of the three day intervention in the government and private school, the follow up session was held for the experimental batches for a period of three hours. This session was conducted after three weeks of intensive training. It was during this session the application of the skills that they had learnt was evaluated based on certain assignments given to them namely the stress diary and taking up a consultative role of depicting their experience of stress and coping mechanism adopted. The follow up was just an informal interaction with the students, where they were provided with opportunities to discuss the problems they face in getting used with the coping skills, and if any new risky situation they faced after the intervention and ways to get it resolved.

Phase - V - Re - administration of tools

The checklist to assess the stress level and stress indicator, were re -administered to the experimental group and control group of both the schools after one week of the follow – up session.

The data then procured was analysed and compared with the pre data to examine the effect of SIT intervention. However in order to check the retention potential of SIT the check list on resilience and stress coping repertoires were re – administered to both the experimental and control group of the two schools after a period of six months (i.e.) in the last week of September.

Also the academic performance of the experimental and control group of students in their annual exam that followed the intervention (during the month of April) was gauged as the 1st post assessment data. However the marks obtained in their quarterly exam of next grade (in the month of September for their 10th standard) was assessed as the 2nd post assessment data to check the consistency of their academic improvement.

After the administration of all the tools the experimental students were urged to fill up the feedback form.

D. ANALYSIS OF THE DATA

The acquired data was statistically analyzed. Chi square test was performed to find the difference among the categories of the levels of stress and stress indicator of students, both before and after the intervention. Univariate Anova was used to compare the means of three variables namely the type of school and the gender with the stress score, stress indicator score and analyze the variables' effect of the stress level and its repercussions of the school students.

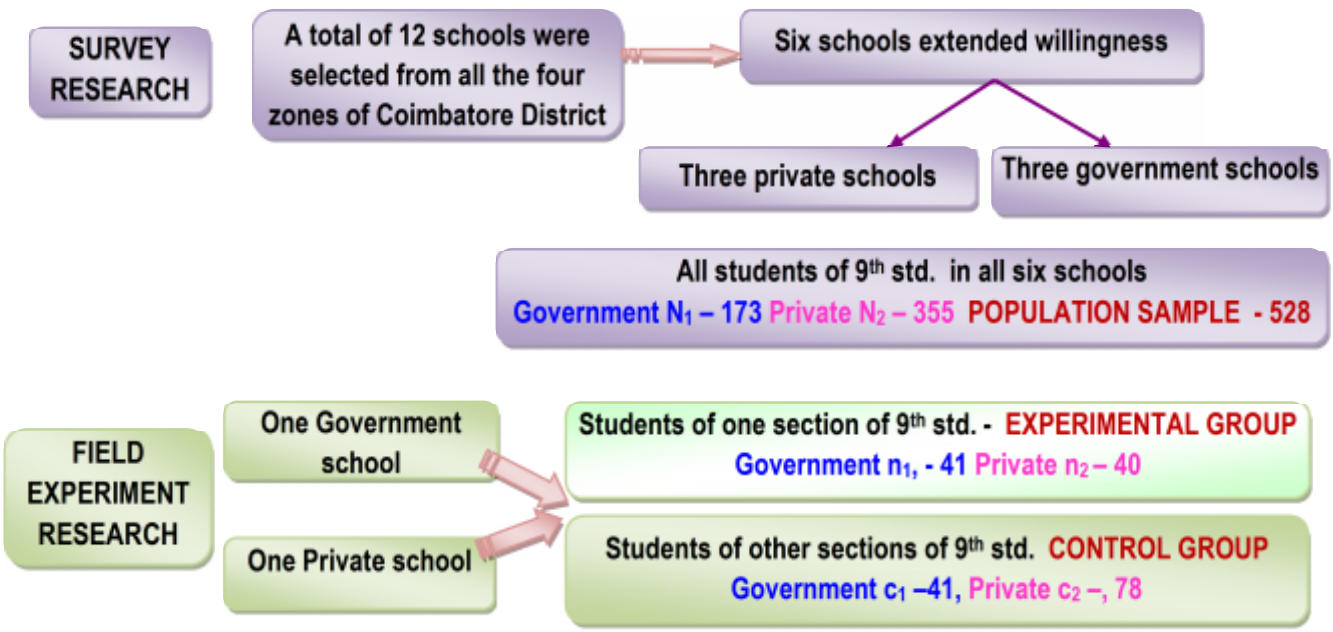
Karl Pearson's Correlation Coefficient was used to assess the relationship between the identified causative factor with the perceived stress level of the students and the reaction experienced and behaviour manifested.

Student 't' test was executed to discover the impact made by the intervention among the student population by comparing the overall mean of the control and the experimental group in the stress core, and its repercussions. The 't' test was acted upon the resilience and stress coping repertoires mean scores of the student sample before and after SIT to assess the impact as well as the retention potential of the intervention.

For all of the statistical tests the level of significance was tested at one per cent level (denoted by **) and five per cent level (denoted by *) (If not significant the value had superscript of ^{ns}). Apart from other data analyzed through percentages, the impact and the retention potential of SIT on the academic performance of students was also gauged. The methodology at a glance was projected as Figure 4a and 4b.

METHODOLOGY AT A GLANCE

1. Identification of sample



2. Construction of tools

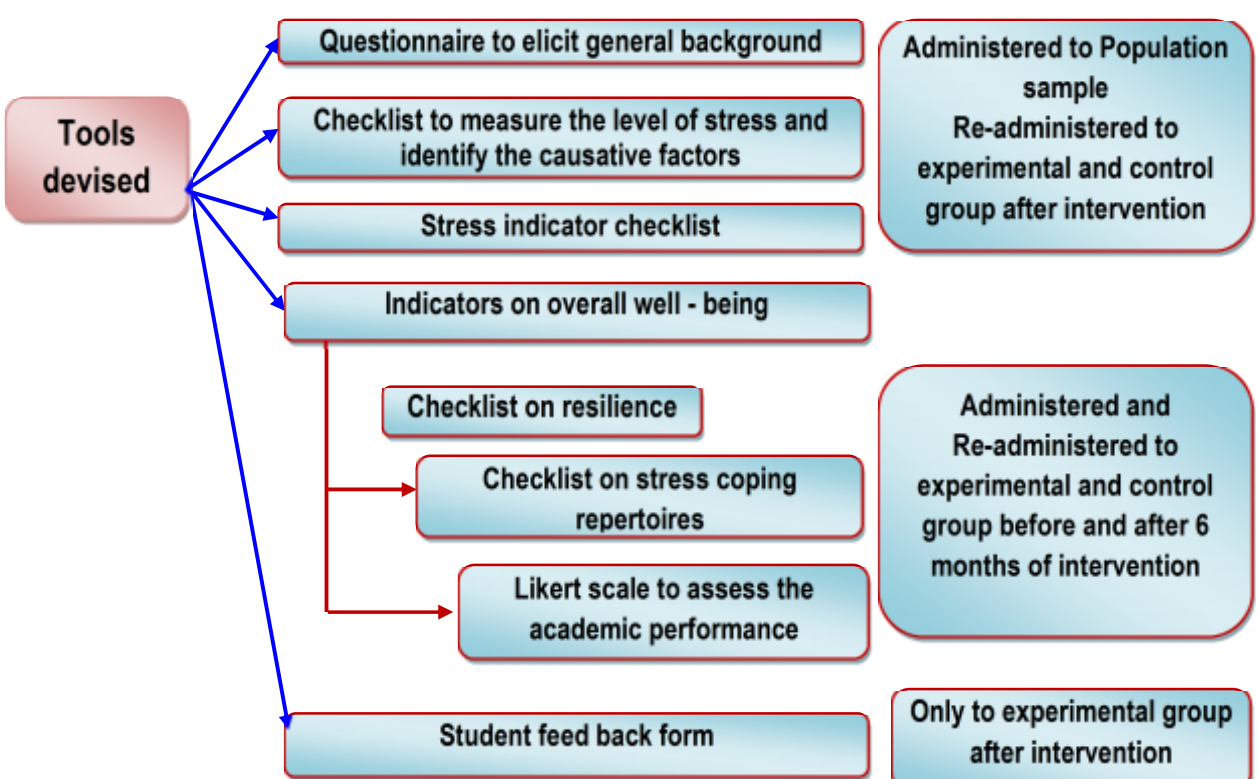
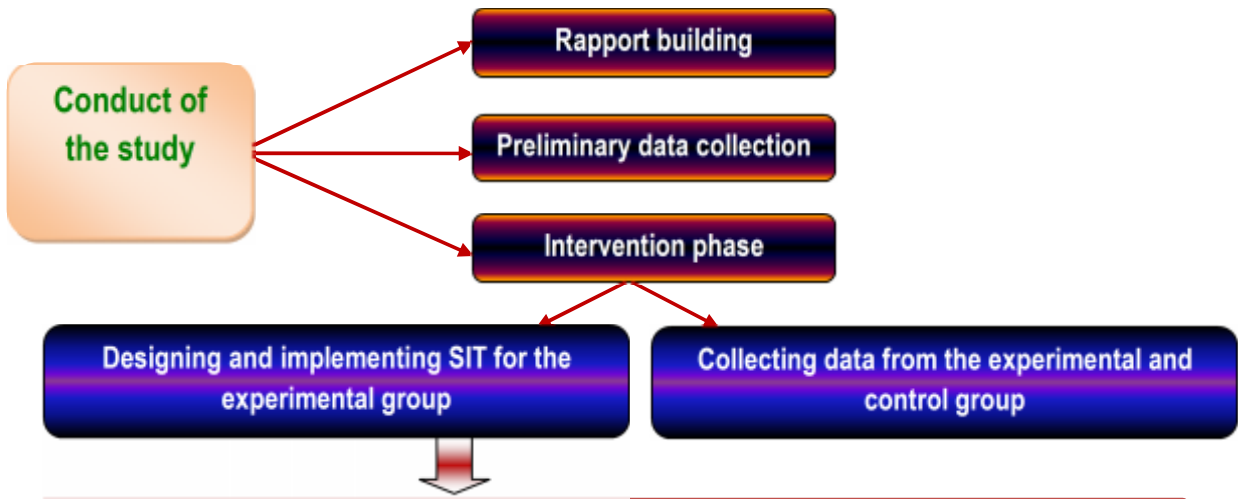


FIGURE – 4a

3. Conduct of the study



SIT

1. **Conceptualization - one day orientation**
   - Understand stress
   - Realize stress triggers
   - Signs and symptoms
   - Effect of stress on performance
2. **Skill development and practice – 3 days continuous training**
   - Demonstration of coping skills – one day
   - Practice of skills through activities – half a day
   - Instilling confidence and general tips – half a day
   - Rehearsal of skills – 1 day
3. **Application and follow-up – two half a day interaction between a time gap of six months**
   - 1st follow up, three weeks after 2nd phase of SIT
   - 2nd follow up after six months of SIT
   - Scaffolding
   - Feedback of the stress diaries
   - Sharing of experiences
   - Bolstering self - efficacy

FIGURE – 4b