

III. METHODOLOGY

Youth wellbeing has always been the major concern of every society. Empowering youth for the betterment of society is one of the most vital challenges for any country, particularly for a developing nation like India.

Literature reviewed in both national and international studies brings out the picture that youth practice risk behaviours and are also unaware of the resilience they need to enhance and develop. Changed youth lifestyles have become a concern due to the vulnerability of youth towards health risks and trauma, peer pressure, fear of rejection, habits, stress, depression and anxiety, associated poverty, lack of coping skills and emotional deprivation. Changes in youth lifestyles have increased unhealthy behaviours, such as lack of physical activity, excessive use of screen time, skipping breakfast, and lack of sleep (Carson et al., 2017), leading to higher risk of obesity and cardiovascular disease, psychological disorders, visual acuity problems, poor sleep, poor cognitive function and behavioural problems. Tobacco use and substance abuse, on the other hand, pose a significant risk for severe respiratory and cardiovascular diseases, risky sexual behaviours and exposure to violence (Arafa, 2024). Hence, the need arises to identify resilience to help them make better decisions and enhance the existing protective factors with collective patterns of thinking, preferences and behaviours. A sustainable future is important to understand the risks faced by youth and prepare for those risks through adaptation and mitigation measures. Resilience is crucial in this endeavour as it is the capacity to cope with both expected events and surprises, eventually indicating the need to provide support to the youth to be able to bounce back from the negative risks they face in their life. Hence, finding the interrelationship of risk and resilience among youth will support the activities in intervening towards preventing risk and promoting resilience.

With this backdrop, the current study focused on risk and resilience, where they tend to prevail collectively and co-exist in many ways. The importance of studying both concepts simultaneously is seen as a holistic approach to challenges. The integration of risk and resilience studies provides a comprehensive framework for understanding and addressing the complexities of challenges faced by individuals and communities, enabling the development of strategies that not only mitigate risks but also enhance

adaptive change capacities for sustainable recovery and growth. With this, the research questions were set up:

Research Questions:

Similar to how the study addresses objectives on the concepts of risk and resilience through a literature review, the study has tried to answer the following questions concerning risk and resilience among youth after an in-depth literature review:

1. Whether the various risk factors and elements of resilience prevail collectively?
2. If risk and resilience co-exist, what is their interrelationship?
3. Whether socio-demographic conditions determine risk and resilience factors?
4. Does sensitising youth enhance resilience and reduce risk?

Studying the risk and resilience among youth involves an extensive methodology that consolidates various approaches in understanding both the risk and resilient protective factors influencing young people. There's a structured methodology that researchers often employ in the formulation of the dependent and the independent variables. The current research study's dependent and independent variables were identified:

- **Dependent variables:** The dependent variables for the study were the risk behaviours such as safety issues, attempting suicide, substance use, sexual behaviour and health issues of youth. Resilience factors such as self-belief, optimism, ingenuity, adaptability, challenge orientation, purposeful direction, emotional regulation and support seeking among youth
- **Independent variables:** Socio-demographics such as age, gender, educational qualification, area of residence, father's and mother's education, father's and mother's occupation, and family annual income were the independent variables selected for the research study.

Research design: A research design is a structured plan or framework used to conduct a research study. It outlines the overall approach and methods used to collect and analyse data to answer research questions or test hypotheses (Singh, 2023). The current research study was an action-based cross-sectional study. Surveys, questionnaires and interview

methods were predominantly adopted to collect the data. With the objectives identified and research questions formed, the research study was framed under five phases:

I. Phase I: The first phase was conducted under the following subheads:

- A. Review of literature
- B. Population and Sampling
- C. Selection of Assessment Tools
- D. Obtain Institutional Human Ethical Clearance: *Ethical consideration*

II. Phase II: Data collection, data before the sensitisation (Pre-sensitisation data)

III. Phase III: Data analysis- Analysis of pre-sensitisation data

IV. Phase IV: Conduct of sensitisation programme and data collection (Post-sensitisation data)

V. Phase V: Data analysis- Analysis of post-sensitisation data

Phase I:

- A. **Review of literature:** A literature review is a comprehensive analysis and summary of existing research on a specific topic. It is an important component of academic research since it summarises the present state of knowledge in a certain subject and helps to direct future studies. The main goal of literature reviews is to identify major significant themes and topics in the literature, as well as gaps in the literature and possibilities for future research. It is also intended to assess and integrate previous studies to uncover trends and patterns. This involved comprehensively collecting, gathering and evaluating information from various sources such as books, journals, articles, thesis and web sources.

Books provide an immense background information, in-depth analysis presenting a deep plunge into belief, psychological theories and concepts. Books offered a comprehensive overview of the subject, facilitate a deeper exploration of ideas, and can even highlight areas where further research is needed. Articles provide a primary channel for researchers to communicate their findings to the wider scientific community. Articles allow for rapid exchange of ideas and

discoveries, enabling researchers to learn from another researcher's work and potentially build upon it. Journals contain current information and provide detailed reports of the methodology and results of research, case series reports, clinical trials, programme evaluation and other kinds of research studies. Thesis, on the other hand, generates new knowledge and insights with an in-depth exploration of research topics. Thesis leads to more rigorous and reliable research practices, also illustrates what the study does and reflecting the statement of the research problem. Lastly, web sources contribute access to a vast and diverse range of information that enables researchers to explore different perspectives, identify emerging trends and connect with other researchers. Overall, these resources help spot the research gaps, clarify the study's focus and notify the operation of an assessment tool, making sure the research is reasonable, logical and addresses the pending and unresolved research questions.

In the current study, the investigator conducted a thorough review of existing literature on risk and resilience factors among youth. The reviews were selected from both the Indian and global studies. Identified the key theories, studies, and methodologies in the research of risk and resilience and their inter-relationship and co-existence. Further, literature survey helped navigate to culminate the risk behaviours under specific issues of risk such as safety issues, attempting suicide, substance use, sexual behaviours and health issues by CDC and resilience component such as self-belief, optimism, purposeful direction, adaptability, ingenuity, challenge orientation, emotional regulation and support seeking assessed by assessment and developmental consultant (a&dc). The researcher identified the objectives and formulated clear research questions that address a few specific aspects of risk factors that increase vulnerability and resilience components that promote positive adaptation among youth.

- B. Population and sampling-** Based on the study purpose, the population and sampling methods for the current study are discussed, and the simple random sampling procedure was adopted for the first phase of the study, which was carried out in two stages: A-selection of area, B-selection of sample

Stage A- Selection of area: The study was conducted in Coimbatore city of Tamil Nadu state. Tamil Nadu is the southernmost state of India (Public Election Department, Government of Tamil Nadu, 2021). The tenth largest Indian state by area and the sixth largest by population, Tamil Nadu is the home of the Tamil people, who speak the Tamil language, the state's official language and one of the longest surviving classical languages of the world (Chief Electoral Officer, Tamil Nadu, 2021). The capital and largest city is Chennai (Ministry of Education, Government of India, 2025).

Tamil Nadu covers an area of 130,058 km² (50,216 sq mi) and is the tenth-largest state in India (Demography of Tamil Nadu Report, Government of India, 2023). Located on the south-eastern coast of the Indian peninsula, Tamil Nadu is straddled by the Western Ghats and Deccan Plateau in the west, the Eastern Ghats in the north, the Eastern Coastal Plains lining the Bay of Bengal in the east, the Gulf of Mannar and the Palk Strait to the south-east, the Laccadive Sea at the southern cape of the peninsula, with the river Kaveri bisecting the state (Patrick, 1907). Politically, Tamil Nadu is bound by the Indian states of Kerala, Karnataka and Andhra Pradesh, and encloses a part of the union territory of Pondicherry (Aiyappan, 2025). In 2022-23, Tamil Nadu's per capita income stood at ₹2.78 lakh, 1.6 times the national average of ₹1.69 lakh. It has consistently exceeded the national average over the years. This makes Tamil Nadu the fourth-largest state in per capita income. The state's per capita income is significantly above the national average (State Planning Commission, Government of Tamil Nadu, 2025). As of December 2023-24, the state's GSDP stood at 27.22 lakh crore, registering a real economic growth rate of 8.23 percent, making it the second-largest economy amongst the 28 states of India (Rao, 2024).

Tamil Nadu is a highly industrialised state, contributing 12.25 percent of the manufacturing real GDP of the Country, and its share of India's real GDP is 9.08 percent in 2022-23 (Rangarajan & Shanmugam, 2024). With its diverse culture and architecture, long coastline, forests and mountains, Tamil Nadu is home to several natural resources, ancient relics, historic buildings, multi-religious pilgrimage sites, beaches, hill stations, forts, waterfalls and eight UNESCO World Heritage sites (Gupta, 2015). The state's tourism industry is the largest among the Indian states. The state has

three biosphere reserves, mangrove forests, 5 National Parks, 18 wildlife sanctuaries, 17 bird sanctuaries, 3 conservation reserves and 5 Tiger reserves (Rajendran, 2025).

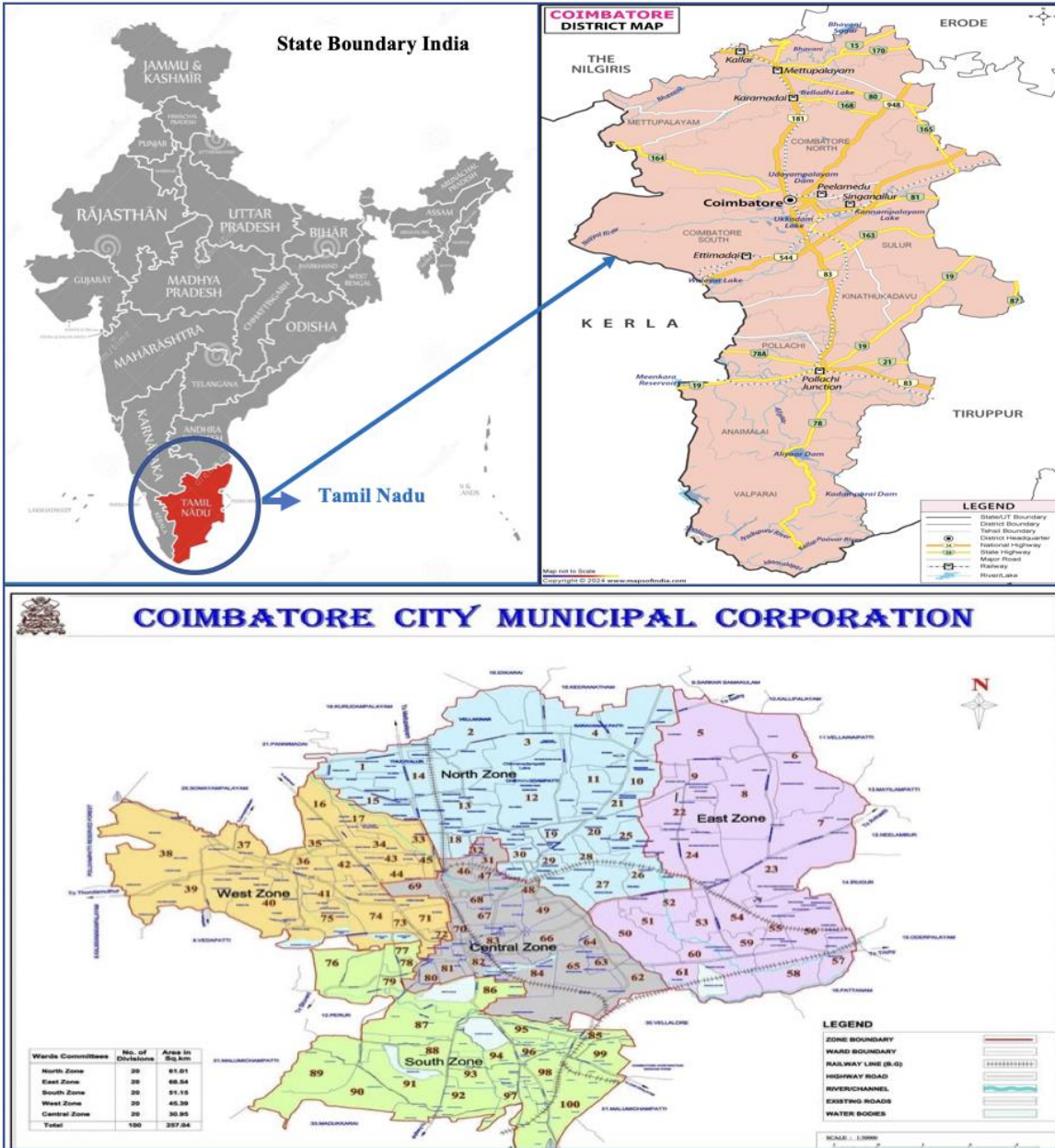
As per the 2011 census, Tamil Nadu had a population of 72.1 million and is the seventh most populous state in India (Office of the Registrar General & Census Commissioner, India, 2022). The population was projected to be 76.8 million in 2023 and to grow to 78 million by 2036 (Population projection report 2011-36 Report, Government of India, 2020).

Tamil Nadu has a literacy rate estimated to be 82.9%, higher than the national average of 77.7% as per the 2017 National Statistical Commission survey. As of October 2021, the state had over 37,211 government schools, 8,403 government-aided schools and 12,631 private schools, which educate 5.47 million, 2.84 million, and 5.69 million students respectively (School Education Department, policy 2023-24 Report, Government of Tamil Nadu, 2023 & The Hindu, 2023). As of 2023, there were 56 universities in the state, including 24 public universities, four private universities and 28 deemed-to-be universities (AUBSP, 2023).

Coimbatore, a city in Tamil Nadu which is also known as the “Kovai”, is one of the major metropolitan cities and the second largest city in Tamil Nadu after Chennai in terms of population, and the 16th largest agglomeration in India as per the 2011 census. It is located 11°16'N, 76°58'21"E in southern India at 427 meters (1,401 feet) above sea level on the banks of the Noyyal River, in North Western Tamil Nadu (City Population, 2016). The Noyyal River forms the southern boundary of the city, which has an extensive tank system fed by the river and rainwater (Wilbur Smith Associates, 2014). It covers an area of 642.12 km². It is surrounded by the Western Ghats mountain range to the west and the north, with reserve forests of the Nilgiri Biosphere Reserve on the northern side (Reginald et al., 2007).

As per the District Census Book 2011, Coimbatore district had a population of 3,458,045 with a sex ratio of 1,000 females for every 1,000 males. The population of the urban agglomeration as per the 2011 census was 2,136,916, with males constituting 50.08% of the population and females 49.92%. Coimbatore has an average literacy rate of 89.23%, higher than the national average of 74.04%. Male literacy is 93.17% and

female literacy is 85.3%, with 8.9% of the population under six years of age. The sex ratio was 964 females per 1000 males (Population Census, 2025). In 2011, the population density in the city was 10,052 per km² (26,035 per mi²) (The Registrar General & Census



Source: Coimbatore Municipal Corporation

Figure 2: Area of the study - Location of Coimbatore district and Coimbatore city with 5 zones in Tamil Nadu, India.

Commissioner, Ministry of Home Affairs, Government of India, 2011). Around 8% of the city's population lived in urban slums. As of 2013-14, the state had over 6 Universities, with 28,723 students studying respectively. There were a total of 189 colleges that educated 74,490 college students, and there are also a total of 1,858 of schools in the district of Coimbatore (District Statistical Handbook, Government of Tamil Nadu, 2018).

In 1804, the Coimbatore district was newly carved out and was established as the capital of the newly formed district. The city experiences growth in population due to rapid industrialisation and emerging educational institutions, both in the urban context and the outskirts, leading to an increase in land use. The city's east zone has seen a rise in commercial land use, while the north and west zones have witnessed a steady increase in residential land use (Rishab et al., 2018). Being a hub of the textile industry in South India, the city is referred to as the "Manchester of South India" (The Indian Express, Government of Tamil Nadu, 2011).

India by India Today the 2014 annual survey has ranked Coimbatore as the best emerging city and fourth among Indian cities in investment climate by the Confederation of Indian Industry, and 17th among the top global outsourcing cities by Tholons. Coimbatore has been selected as one of the Indian cities to be developed as a smart city under the Smart Cities Mission and AMRUT by the Government of India (Ministry of Housing and Urban Affairs, Government of India, Coimbatore, 2015).

Stage B- Selection of Sample: The calibre of a country's youth is a crucial determinant of its future. The sample for the present study included youth between the ages of 18-22 years following a simple random sampling technique. The age range of 18-22 years comes under 15-24 according to WHO, and 15-29 years as per the youth population statistics of Tamil Nadu. In the present study, 18-22-year-old youth were chosen because it was feasible to choose the youth population in college/university in the age group of 18-22 years, because of accessibility for conducting a sensitisation programme.

Youth were selected from the Coimbatore city/district limits. Youth were recruited for the study from the college in and around Coimbatore. Coimbatore has five zones, namely east, west, north, south and central zones. To have an equal

representation of youth from all zones of Coimbatore, a total of 15 colleges were selected from all five zones. Three colleges were approached from each zone. These colleges were selected based on the strength of the students, zonal representation and distance of 25 km from the institute, constituting a total of 2584 students. Co-education institutions were included in the present study to maintain homogeneity. Both government and private sector institutions were selected for the study, with English as a learning medium.

However, after the process of seeking permission from the college authorities, only 6 colleges - 2 colleges from the north zone and 1 college each from the south, central, west and east zone expressed their willingness to participate in the study and permitted the researcher to meet the youth of their college and collect the data. The investigator ensured the smooth conduct of the research by seeking voluntary participation and wholehearted cooperation from all 6 selected colleges.

Accordingly, undergraduate and post-graduate students from all 6 colleges constituted a population sample of 1710 students who consented to participate in the study. Out of which 468 students were from the north zone, 218 students from the south zone, 235 students from the central zone, 375 students from the west zone and 414 students from the east zone. These participants came from both rural and urban areas, belonging to joint and nuclear families, studying in colleges of Coimbatore city. On the whole, the total population sample covered a total of 1710 youth/students, comprising of 799 females and 911 males.

The inclusion criteria for the sample selection were – the youth should be between the ages of 18-22 years, and should be able to read and write English as the assessment tools (written) were communicated in English. The exclusion criteria were – the youth with special needs who were physically challenged, as well as those undergoing any psychological and psychiatric treatments. They were excluded from the study based on the observation of the researcher, seconded by teachers' and parents' concurrence.

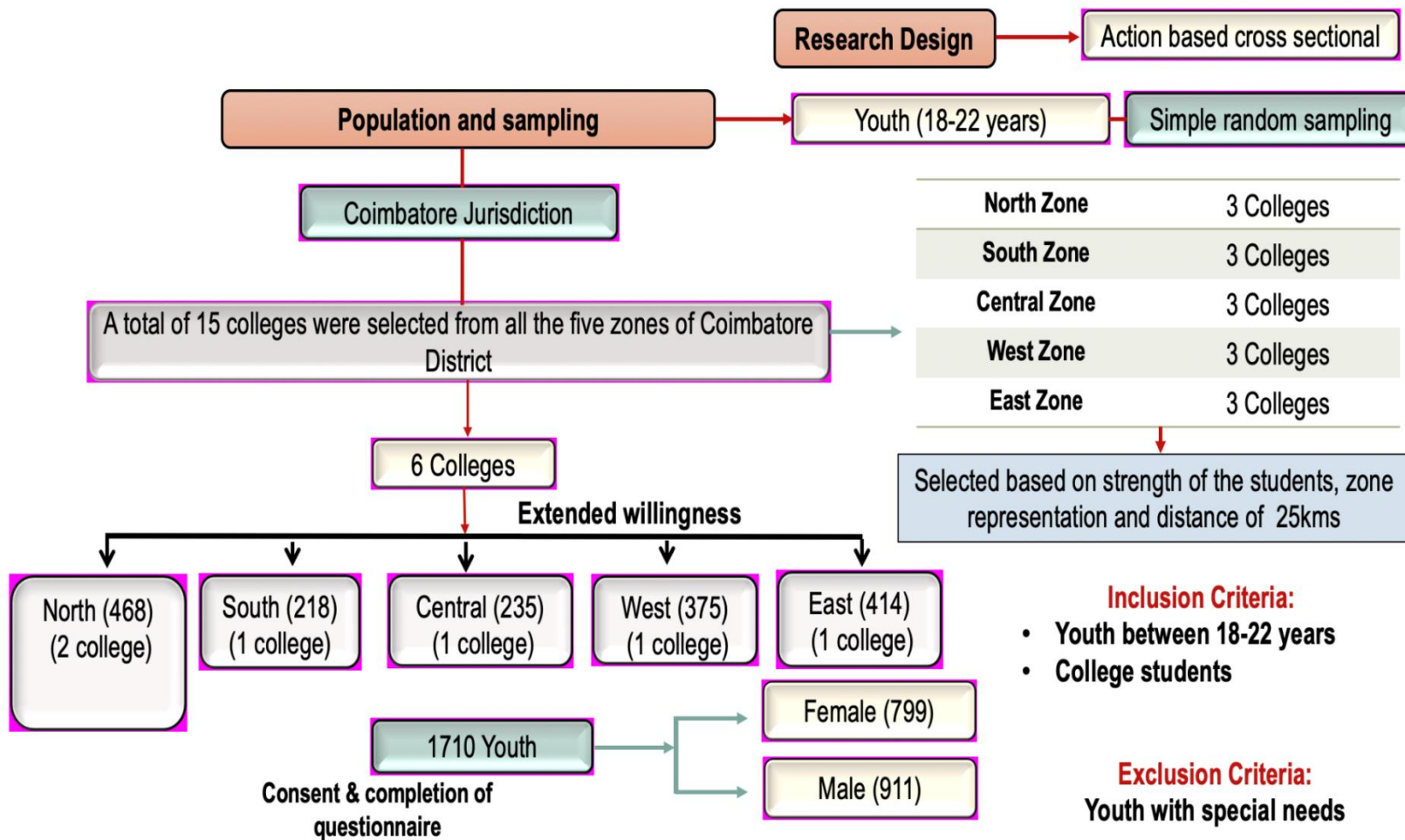


Figure 3
Population and Sampling -At a Glance

C. **Selection of Assessment Tools-** Selecting an appropriate assessment tool in a research study is crucial for obtaining valid and reliable data, ensuring meaningful results and informing research conclusions, allowing the researcher to accurately measure what they intend, reduce bias and provide data that can be used to answer specific research questions. Selecting the right tool in research involves carefully considering the research question, the target population and the desired outcomes. The following three questionnaires and tools were used for the study:

- A self-developed questionnaire to elicit information on the socio-demographic conditions
- The 2019 Youth Risk Behaviour Surveillance by the Centers for Disease Control and Prevention (CDC)
- The Resilience Scale 2017 by the Assessment and Development Consultants (a&dc)

Socio-demographic questionnaire: A self-developed questionnaire was administered to elicit information on the socio-demographic conditions. The information on the socio-demographic conditions provides insights into the personal and family background of the individual as well as their living conditions that possibly may influence their behaviours and opinions contributing towards valuable comprehension for research purposes. The questionnaire consisted of information regarding the age, gender, educational status, types of family, area of residence, zone representation, father's and mother's education, father's and mother's occupation, and family annual income.

Youth Risk Behaviour Surveillance System (YRBSS): The 2019 YRBSS is a self-report scale that was developed by the Centers for Disease Control and Prevention (CDC) to track a broad range of behaviours, experiences and conditions among youth risk behaviour over time, it was directed to a sample of youth between the age range of 10-29 years, planned to monitor health behaviour trends and identifying youth risk-behaviours. The Centres for Disease Control and Prevention (CDC) tracks certain youth-at-risk behaviours that they have deemed important and observable in their Youth Risk Behaviour Surveillance System (YRBSS). The Youth Risk

Behaviour Surveillance System (YRBSS) has multiple purposes. The system was created and designed in such a way to enable and empower public health professionals, educators, policy makers, and researchers to 1) describe the prevalence of health-risk behaviours among youth, 2) assess trends in health-risk behaviours over time, and 3) evaluate and improve health-related policies and programmes.

Tool Description: YRBSS assesses five risk behaviours grouped under safety issues, attempting suicide, substance use, sexual behaviour and health issues.

- Safety issues: comprising risk of driving and safety, violence and bullying, with 17 items, with a score of 1 for each item marked. The sum of the scores shows the level of risk concerning safety issues, with 17 being the lowest score and 50 the highest.
- Attempting suicide: considered to be a single major risk among youth comprises 5 items, to be answered only in “Yes” or “No”, with a score of 1 for each item marked. The sum of the scores shows the level of risk in attempting suicide, with 5 being the lowest score and 10 the highest score.
- Substance use: includes smoking, use of tobacco, alcohol consumption, drug use and self-medication with 30 items, with a score of 1 for each item marked. The sum of the scores shows the level of risk towards substance use, with 30 being the lowest score and 151 the highest.
- Sexual behaviour: a major risk among youth with multiple factors contributing, with 9 items, with a score of 1 for each item marked. The sum of the scores shows the level of risk on sexual behaviour, with 9 being the lowest score and 39 the highest score.
- Health issues: encompasses body weight, diet, concussion, physical activities and other health-related issues, with 31 items, with a score of 1 for each item marked. The sum of the scores shows the level of risk on health issues, with 31 being the lowest score and 145 the highest. Table 1 shows the classification of risk factors based on low, moderate and high levels.

Table I

Classification of the Level of Risk Behaviour

Risk Behaviour	Min. and Max. score	Low	Moderate	High
Safety issues (17)	17-50	17-30	31-40	41-50
Attempting suicide (5)	5-10	(NO) 1-7	-	(YES) 8-10
Substance Use (30)	30-151	30-84	85-117	118-151
Sexual Behaviour (9)	9-39	9-13	14-29	30-39
Health Issues (31)	88-145	88-107	108-126	127-145

The Youth Risk Behaviour Surveillance System (YRBSS) tool was checked for validity and reliability. The tool was pilot tested with 124 youth. The scores of validity and reliability (Table 1) showed that the tool is well suited for the intended use, with the scores of reliability and validity (KMO and cumulative percentage) indicating acceptable levels.

Table II

Reliability and Validity Scores of Risk Scale (YRBS)

Reliability	Validity		
Cronbach's Alpha	KMO	Bartlett's Test of Sphericity-Sig	Cumulative
.68	.712	.000	65.918

The Resilience Scale: The Resilience Scale 2017 was developed by assessment and development consultants (a&dc), used to assess the quality of resilience/ response of resilience. It includes measures of resilience within self, and in family, school, peer, and community domains. Resilience has been identified as a key factor in determining how people adapt, interpret, and respond to situations, while the challenges may differ across contexts.

Tool Description: The resilience scale comprises eight components, namely- self-belief, optimism, purposeful direction, adaptability, ingenuity, challenge orientation, emotional regulation and support seeking.

- Self-belief- The extent to which youth have confidence in their ability to address problems and obstacles that they encounter
- Optimism- The extent to which youth believe that they will experience good outcomes in life
- Purposeful direction- The extent to which youth have clear goals that they are committed to achieving
- Adaptability- The extent to which youth are willing to adapt their behaviour and approach in response to changing circumstances
- Ingenuity- The extent to which youth perceive they are capable of finding solutions to problems they encounter
- Challenge orientation- The extent to which youth enjoy experiences that challenge them and perceive stretching situations as opportunities to learn and develop
- Emotional regulation- The extent to which youth can remain calm and in control of their emotions in stressful situations
- Support seeking- The extent to which youth are willing to ask others for help and support when dealing with difficult situations

There are a total of 10 items in each component, and items are measured on a 5-point rating scale with 5,4,3,2, and 1 scores for “Always”, “Often”, “Sometimes”, “Rarely” and “Never”, with 10 as the lowest score and 50 as the highest. The sum of the scores for each component indicates the level of resilience according to the measuring scale. Table III shows the classification of resilience factors based on high, moderate and low levels, fixed according to the standardised scale norms by assessment and developmental consultants (a&dc).

Table III**Classification of Levels of Resilience**

Resilience components	Min. And max. Score	Low	Moderate	High
Self-belief (10)	10-50	1-4	5	6-10
Optimism (10)	10-50	1-4	5	6-10
Purposeful direction (10)	10-50	1-4	5	6-10
Adaptability (10)	10-50	1	2	3-10
Ingenuity (10)	10-50	1-3	4	5-10
Challenge orientation (10)	10-50	1-4	5	6-10
Emotional regulation (10)	10-50	1-5	6	7-10
Support seeking (10)	10-50	1-3	4	5-10

The Resilience Scale tool was checked for validity and reliability. The tool was pilot tested with 124 youth. The scores of validity and reliability (Table IV) showed that the tool is well suited for the intended use, with the scores indicating good levels of reliability and validity (KMO and cumulative percentage).

Table IV**Reliability and Validity Scores of Resilience Scale**

Reliability	Validity		
Cronbach's Alpha	KMO	Bartlett's Test of Sphericity-Sig	Cumulative
.79	.768	.000	76.698

Institute Human Ethical Clearance: Ethical approval was obtained from the Institutional Human Ethical Committee. Accordingly, permissions were obtained from the college administration to conduct the research. The higher authorities of the colleges selected and the class tutors of the identified students were informed about the study.

The study also allowed voluntary choice for participants. Further, the students and their parents were informed about the research and their participation was taken through a written consent form. The application form explaining the design and the protocols used in the research study was subjected to the Institutional Human Ethical Committee (IHEC), and clearance was obtained. The approval number for the study was AUW/IHEC/HD-19-20/XPD/44. The clearance certificate issued by the Institutional Human Ethical Committee was furnished as Appendix I

Phase II: Data collection, data before the sensitisation (pre-sensitisation data)

- 1. Building rapport for collecting preliminary data:** After acquiring the Institutional Human Ethical Committee (IHEC) and permission, frequent visits were made to colleges to enhance rapport with the students before data collection. Rapport building took place between the students and the researcher, where a good introduction was made, small talks to break the ice, engaged in questions and looked for shared interests or common ground to build the trust and relationship with the students. Further, the researcher continued having effective communication, avoiding barriers between the researcher and the participants, listened actively and asked open-ended questions for in-depth responses by demonstrating empathy and respect. The researcher paid close attention to non-verbal communication, such as facial expressions and mannerisms of the students. Establishing rapport with the selected youth was essentially carried out to have active participation of the youth in a smooth and with a maximum level of valid response.
- 2. Seeking consent:** Adhering to ethical guidelines when conducting research involving the youth, particularly the vulnerable populations, consent was acquired from all participants and the colleges. Since the survey consisted of few sensitive questions regarding substance abuse, violence, and sexual behaviour; a sense of confidentiality was developed and the participants were assured of protecting their identity.
- 3. Data collection:** Data collection on the college campus was started soon after the rapport building and obtaining consent. Before administering the socio-demographic questionnaire and the risk and resilience scales, the procedure for providing the information and the time of completion were explained and illustrated clearly to the

participants. Questionnaire and scales were distributed, and the participants took 15 minutes to 35 minutes maximum to complete the three compiled questionnaires and the scales. The researcher was available for the participants to give clarifications for any queries. The process of data collection had to pause (for the last few numbers of data) for some months in the academic year 2019-20 and 2020-21 due to the COVID-19 pandemic lockdown and continued on a hybrid mode at the end of the academic year 2020- 21 due to the restrictions of the pandemic.

Phase III: Data analysis of pre sensitisation data

Analysing data, applying statistical and logical techniques to illustrate and evaluate the pre-sensitisation data from youth based on their risk behaviours and resilience components.

Data analysis: The first set of data (before sensitisation) collected in phase II was coded and consolidated for further analysis. Statistical techniques such as frequency and percentage, multiple linear regression and canonical correlation were applied to interpret the numerical data.

Frequency and percentage: Frequency (f) is the number of times the value occurs in the data, and percentage is defined as by hundredth of a number used in data analysis that helps in calculating information and comparison. Frequency and percentage were used to understand the magnitude of risk and resilience levels among the selected youth in the city of Coimbatore. The socio-demographic distribution of age, gender, educational qualification, types of family, area of residence, parents' education, parents' occupation and family income was done using frequency and percentage calculations.

Multiple linear regression: Multiple Linear Regression is an analysis used to describe relationships between variables by fitting a line to the observed data, a functional relationship between two or more correlated variables that is often empirically determined from data and is used especially to predict values of one variable when given values of the others. It allows for estimating how a dependent variable changes as the independent variable(s) change. In the current study, multiple linear regression was done to identify the predictive capacities of socio-demographic markers such as age, gender,

educational qualification, types of family, area of residence, parents' education, parents' occupation and types of family on the risk factors and resilience components of youth.

Canonical correlation analysis: Canonical correlation analysis (CCA), developed by Hotelling in the 1930s, also called canonical variate analysis, is a way of inferring information from cross-covariance matrices. Canonical correlation analysis, a statistical technique to identify and qualify the association between two sets of variables, was performed to assess and explore the significant relationship of risk factors with the resilient elements among youth, all measured on the same individual/observation using the correlation technique. CCA creates pairs of linear combinations of the variables that have maximal correlation. Risk factors being the predictor variable and resilience components being the outcome variable, the data were analysed.

Phase IV: Conduct of sensitisation programme and data collection (Post-sensitisation data)

Developing youth sensitisation modules, conducting the sensitisation programme and collecting data after the sensitisation (Post-sensitisation data)

Sensitisation is the phenomenon in which responsiveness is enhanced, generally in a nonspecific manner, usually by an intense event. An educational sensitisation was planned for behavioural change among the participants, which included educational activities, interactive sessions designed to educate, and workshops to raise awareness among the selected youth based on the findings of the data analysed before sensitisation.

A sensitisation programme was conducted for the youth in one of the colleges in the central zone of Coimbatore city based on the prevalence of risk among the youth and the permission granted. A total of 184 youth were selected for the sensitisation programme using a controlled randomised selection technique, where 122 youth were taken as the experimental group based on their willingness to participate in the programme, and 62 youth were taken as the control group (waitlist). The sensitisation programme was conducted for 2 weeks (4 days per week), consisting of 16 sessions (2 sessions per day). Each session lasted for one and a half hours, including questioning and focus group discussion. Data was collected from the experimental and control groups after the sensitisation programme (post data). Post data collection was done at two intervals. The first post-data was collected after 10 days of the programme, and follow-up

data was collected after a gap of a month. The pre-sensitisation scores were taken from the data collected during the II phase (before sensitisation). The sensitisation programme was conducted by the investigator with the help of a trained clinical psychologist.

Conceptual framework of the sensitisation programme: The conceptual framework informs about reaching out to youth with a focus on promoting protective factors that build capacity in youth-at-risk and enhancing resilience. Regulating the most pertinent instrument to be aware of the existing risk factors and behaviours, and finding techniques and ways to combat risk. Therefore, an effort was taken to accumulate literature about protective factors that could intervene early and at the same time prevent the development of risk behaviours among youth. The constructs behind the development of the sensitisation programme are the state of youth today and the results of the pre-sensitisation data of the current study.

i) State of the youth today: A look into the available data on the prevalence of risk behaviours among youth is very alarming. A rapidly growing and urbanising society has kept today's youth in the most vulnerable position, with the world at their fingertips. This vulnerability draws the focus on youth as central to the success of many public health agendas, aiming to reduce health risks, especially reproductive health and mental health. So, focusing on risks related to health, safety, substance abuse, and emotional well-being provides important opportunities to improve health and well-being both in their present youth life and later in their future life.

ii) Results of the pre-sensitisation data of the study: The study strived to identify the level of risk and resilience among the youth from various colleges. The results of the pre-sensitisation served as a base to build a layout of the framework of the sensitisation programme. The key findings of the study highlighted that smoking, tobacco, alcohol, drugs and self-medication risks were seen to be higher and are of more concern among youth. Also, the study indicated that the majority of the youth experienced a low level of resilience. The answer to the question of how to combat the prevailing risk factors was to magnify their resilience. Also, by figuring out the strategies for preventing risk at an early stage, and the idea of helping them to practice the protective factors as a routine, was through a sensitisation programme.

Content development and activities for sensitisation programme: To reach out to the youth effectively and to enhance feelings of control, meaning and connectedness, certain activities were planned, like having face-to-face communication related to making decisions, skills and knowledge which can contribute to building resilience and competencies among youth.

Session modules were planned accordingly based on the needs of the participating youth. Sessions on various topics such as unhealthy and abusive risks, addictions, building self-love, strengthening self-efficacy, and strengthening protective factors were planned. Ice-breaking activities, focus group discussion, quiz, panel discussion, and simulation exercise were conducted for positive awareness. The planned activities and events were arranged accordingly to the given schedule of the institution.

Conduct of the sensitisation programme: The programme was carried out during college working hours with both the experimental and wait-list control groups. An orientation was conducted to familiarise the youth with the programme and the study. The clinical psychologist played a crucial role in conducting the sensitisation programme for the youth using the validated educational content, delivering lectures/awareness, clearing doubts, tailoring messages to the students to make them aware, and providing counselling sessions as per the need and requirement. The role of the researcher was to conduct focus group discussions, exercises, and activities for the students and completely assist and facilitate the clinical psychologist, provide accurate information, carry out evaluation, and conduct impact assessment. Session-wise, the sensitisation programme is detailed in Table V

Table V: Session-wise Description of Sensitisation Programme

Session no.	Topics	Name of the activity / activities	Objectives / goals	Actions
Session 1	<ul style="list-style-type: none"> • Snowball, Self Portrait and Who Am I? • What is risk & resilience? 	<ul style="list-style-type: none"> • Ice-breaking activities • Lecture 	<p>To help create an open environment in which all participants are willing to open up and participate, have overall classroom experience and contributing to a positive learning environment.</p>	<p>Before starting the actual session, the youth were given a scale on risk and resilience and were then collected back. This session was provided with a lecture on the Topic- “Risk and Resilience-the actual concept”, “the crisis of risk and the stability of resilience”.</p>
Session 2	<ul style="list-style-type: none"> • Healthy, unhealthy and abusive risk 	<ul style="list-style-type: none"> • Lecture 	<p>To help people recognize the ways abuse and unhealthy relationships can impact or destroy their lives.</p> <p>To improve societal understanding,</p> <p>To know how violence has enormous health and social consequences even death.</p>	<p>The psychologist gave a lecture on the difference between healthy behaviours, unhealthy and abusive behaviours in any relationships, kinds of abuse which includes physical abuse-hitting, slapping, shoving, spitting, kicking, choking, causing any other kind of physical pain, etc., sexual abuse- unwanted touch including kissing, sexual assault, forced intercourse, being drunk or drugged before intercourse etc. emotional abuse-jealousy, anger, dishonesty, name-calling, dependence, threats. Violence in the form of bullying, increased substance use, and sexual behaviour under the influence of alcohol that may result in violence in the form of sexual assault. (Appendix VI)</p>

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Session 3	<ul style="list-style-type: none"> • Reduce addiction 	<ul style="list-style-type: none"> • Lecture 	<p>To educate and prevent the use and misuse of drugs.</p> <p>To understand the development of substance use disorders and premature death.</p>	<p>The psychologist spoke about drugs, smoking, alcohol, tobacco use. Highlighted on the addiction that comes in different stages - from initial use to addiction till the stage it relapses. Sensitised on the cycle of psychological addiction - the eight stages- frustration, fantasizing, obsessing, begin opioid use, loss of control, consequences, discontinue opioid use and time pass. (Appendix VII)</p>
Session 4	<ul style="list-style-type: none"> • Building self-love 	<ul style="list-style-type: none"> • Lecture • Find yourself - quiz activity 	<p>To learn to treat oneself with compassion and love.</p> <p>To support their life satisfaction and overall-wellbeing.</p> <p>To motivate students on positive behaviour while reducing harmful behaviour.</p>	<p>The participants was asked to write about their own story, their experiences about self-love. Their doubts on self-love were answered. The psychologist gave a motivational speech about how to practice self-love, where even if one doesn't feel particularly powerful, one needs to think about how far they have come, how they have survived. (Appendix VIII)</p>
Session 5	Strengthening self-efficacy	<ul style="list-style-type: none"> • Question answer round • Lecture 	<p>To empower and to believe in their abilities and tackle challenges with confidence and resilience, to accomplish tasks and achieve goals.</p>	<p>Few questions were asked by the psychologist such as what is self-efficacy, why is self-efficacy important for well-being? What is the role of self-efficacy? Why believing in yourself matters?</p> <p>The psychologist talked about high vs low self-efficacy, self-efficacy vs self-esteem vs self-confidence. How does self-efficacy develop? impact of self-efficacy, evaluating self-efficacy, strengthening and building self-efficacy.</p>

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Session 6	4 ways to increase self-efficacy	<ul style="list-style-type: none"> • Lecture • Discussions 	To empower youth by enhancing self-efficacy, to become competent and improve self-belief.	<p>Discussions were held on certain topics such as 1. getting out of the comfort zone-, 2. set SMART goals, 3. Look at the bigger picture and 4. reframe obstacles. Youth were given few ideas to help in the form of a lecture.</p> <p>Take-home messages as steps to increase self-efficacy was given - step1- acknowledge contributors to low or high self-efficacy, step 2-implement organizational practices that build self-efficacy. How can you spot if you have low self-efficacy? –steps to identify self-doubt, procrastination, avoiding challenges, impact on interpersonal relationships, reduced work performance was also highlighted.</p>
Session 7	More on Self-efficacy	<ul style="list-style-type: none"> • Letter to yourself activity 	<p>To understand and accept oneself, helping youth achieve greater academic outcomes, to set challenging goals.</p> <p>Writing letters to themselves can help them build these essential skills.</p>	<p>Students were asked to write a letter about their achievements, things that they are proud of themselves, the mistakes they have learned from and what they can do differently forward.</p> <p>The letter if it brings any negative feelings remind them it is not too late to make changes.</p> <p>Students were asked to write a letter to their future self about what they would like to do and accomplish by the end of the year and lastly to write a thank you letter to themselves about the qualities they are happy to have and achievements they are proud of.</p>

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Session 8	On Resilience	<ul style="list-style-type: none"> Lecture 	<p>To teach students about how challenges and resilience work together.</p> <p>To spread awareness and gain skills on how to manage distress and stress.</p> <p>To help manage the feelings of anxiety and uncertainty.</p>	<p>The psychologist talked about what is resilience, the three domains of resilience such as adaptability, flexibility and learning. Lecture was delivered on adaptability, flexibility and learning skills such as- active listening, asking questions, expanding your comfort zone, willing to change directions and make mistakes, understanding your strengths and knowing how to self-regulate in uncomfortable situations. (Appendix IX)</p>
Session 9	Protective factors	<ul style="list-style-type: none"> Activity (Brainstorming) 	<p>To make youth become aware about the skills, strength, resources, supports, or coping strategies that can help them with stressful events and lower the risk of sickness or injury.</p>	<p>Students were divided into small groups of 3-4 students, an activity sheet was given to each group to brainstorm all the protective factors they can think of to counteract the risk factors of mental health challenges, physical pain and social pressures. Further they were asked to discuss and put forth their views on whether one is at risk through strong friendships, counselling, taking prescribed medication, seeing a doctor, learning refusal skills, avoiding situations.</p> <p>In the next step, students were asked to respond to two questions</p> <p>1. What protective factors exist in my life to help me keep safe when it comes to experimenting with drugs like prescription pills? (Reponses might fall into these categories- family support, strong friendships, social norms, extracurricular activities, culture, faith practices, academic goals, future goals, etc.)</p>

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				2. What can you do to help protect a friend who might be at risk of experimenting with drugs?(responses might fall into these categories- talk to them, encourage them to get help, give them information, include them in some activities to keep them busy, etc.)
Session 10	The 7'Cs Model of Resilience	<ul style="list-style-type: none"> • Lecture • Know your triggers–activity 	<p>To enhance competences, connection and coping strategies for a healthy development.</p> <p>To help one identify themselves whether they are being passive, assertive or aggressive.</p>	<p>What are 7 Cs- control, competence, confidence, connection, character, contribution and coping. The psychologist explained the importance of the model that together allow an individual to show resilience in the face of life's challenges- in believing in one's abilities and self, having the skills to thrive, in working, growing and learning together, being a good person, helping others helps you, having and making a choice. (Appendix X)</p> <p>The activity showed participants how it could be helpful by revealing their abilities, skills, personality, and talents-both on the inside and outside. This helps the youth know their strengths, weakness, opportunities and threats that may come their way.</p>
Session 11	Problem solving	<ul style="list-style-type: none"> • Lecture 	To help students understand the problem objectively.	<p>In this session the participants are taught about the STEP to problem solving-</p> <ul style="list-style-type: none"> • S: say the problem without blame • T: think of a solution safe and respectful • E: explore consequences, what could happen if...

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			<p>To help them analyse their surrounding environment, to identify things they want to change and figure out the things that need to be done to create the desired outcome. To promote happiness and pleasure while reducing stress, depression and anxiety.</p>	<ul style="list-style-type: none"> • P: Pick the best solution, make your plan. (Appendix XI) <p>In this session the psychologist talked about the happy brain chemicals dopamine, oxytocin, serotonin and endorphins and - explains how and why these chemicals are important and how they can affect an individual in many ways. Lastly in this session the psychologist spoke about what can one do to increase their happiness levels through these various chemicals, by meditating, having balanced diet, good food, indulging in developing hobbies and interest in writing, music, exercise, taking cold showers, eating dark chocolate, a massage, etc., (Appendix XII)</p>
Session 12	Circadian rhythm, help addiction and Gratitude	<ul style="list-style-type: none"> • Lecture • Counsellor-client session play • Gratitude journal activity 	<p>To help students prepare their body for expected changes in the environment, To help explore their feelings, beliefs, behaviours, work through challenges and influential memories,</p>	<p>This session started with tips for healthy sleep following the circadian rhythm to have a good sleep and healthy lifestyle. (Appendix XIII)</p> <p>In this session the psychologist discussed about how to talk to someone with addiction- to be kind and accepting, to be consistent, to listen more than to speak, to help them find support and set clear boundaries. A counsellor client session was played (role play) among the participants. In this session an activity was conducted on “let’s do something wonderful” where the youth were shown an attitude of gratitude towards themselves.</p>

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			<p>To identify aspects of their lives they would like to change, better understand themselves and others, set personal goals and work towards desired change,</p> <p>To help practice to handle hard moments without turning to addictive behaviours.</p> <p>To have positive benefits for physical health and psychological well-being, To reduce stress, have improved relationships, to acknowledge and appreciate the people in life.</p>	<p>They were asked to write down the people they are grateful for and things they are grateful to have and the great things that happened in their life today (on the particular day).</p>

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Session 13	Reflection of personality	<ul style="list-style-type: none"> • Activity (Name personality test) 	<p>To promote self-awareness and self-improvement among students and to identify their strengths and weaknesses to improve their learning outcomes.</p>	<p>The session started with an instruction to the participants to spell their names in vertical order and write a word (adjective) reflecting their personality against each spelling of their names. (Appendix XIV)</p> <p>The next activity followed where the participants were asked to think about the feelings for each difficult situation they are dealing at present and to write them down, this activity was to make participants to recognise the feeling and to name it under happy, peaceful, fear, surprise, sad and anger. (Appendix XV)</p>
Session 14		<ul style="list-style-type: none"> • Worry -Iceberg activity • Outside and inside mask activity 	<p>To provide a way into thinking about the underlying factors and distinguishes between what is visible and what is aware of (behaviour and competencies - what is invisible; beliefs and values – what is aware of).</p> <p>To identify the thought and behaviours that they show in different</p>	<p>In this session the participants were given a sheet of paper a part of the activity on “Worry - depicting Iceberg”. This activity has the picture of an iceberg where there is a different level and depth based on the size of the ice berg, Here the participants were asked to write down about themselves in the top part/tip of the iceberg which is visible, where everyone knows about them, in the middle part of the iceberg that submerged is about what not many people know about them and in the lowest part of the iceberg (deeper)is the part where no one knows about them. The last part that is deeper inside is something private which no one knows and it is OK to have it deeper, where some things are meant to be private. (Appendix XVI)</p>

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			environment.	<p>The next activity was called outside mask and inside mask. In the outside mask the participants were asked to put on the faces where they show to their friends, family, teachers, etc. and participants were asked to show these behaviours in the way they like dusting pictures, poetry, colours, words, slogans, phrases, etc.</p> <p>Whereas for the inside mask the participants were asked to express the inside part which they masked all the time, which was who they really are. Similarly like the outside mask, participants were asked to illustrate their true self in any way they liked with pictures, poetry, colours, words, slogans, phrases, etc. (Appendix XVII)</p> <p>These activities helped the participants to understand and to realise about their hidden thoughts, desires, capabilities, and talents as well which can bring out the best in them.</p> <p>On the other hand thoughts, desires and behaviours that can also destroy and ruin their relationships and their personality were also realised, helping youth to think about the changes that they may have to bring in their thoughts and behaviours</p> <p>.</p>

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Session 15	Think before you act and speak	<ul style="list-style-type: none"> Simulation Exercise: Nails in the fence activity 	<p>To help youth to see the damage they can cause if they lose control of their emotions.</p> <p>To learn the importance of self-control.</p> <p>To value people around you who share your everyday life, encourage to succeed, lend an ear, share words of praise, comfort and hold you up just when you need it most.</p>	<p>In the beginning, the participants were asked to form a circle. The investigator created a listening climate and read the story titled 'Nails in the Fence'. After the fourth paragraph, the investigator stopped and asked the students how they think the story will end. Following a short discussion, the teacher read the end of the story and asked a few questions, like</p> <ul style="list-style-type: none"> Do they feel the story has a good ending and why? What does it mean to be impulsive, like the boy in the story? How do they feel when they are angry? And what goes on in their mind and body when they are angry? Is it easy to control and remain calm when angry? Why? How? What are some ways that can help us remain calm when we get angry? How do we feel when we are able to control our anger and remain calm? What goes on in our mind?

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				<p>Further, the participants were asked whether they have the ability to control their impulsiveness like the boy in the story who has learned to stay calm. If any participant has responded they have to give examples of how they have improved. This simulation exercise for impulsiveness was conducted to describe what and how one feels when angry and to find ways to help control one's anger and to describe what one feels when able to control one's anger. (Appendix XVIII)</p>
Session 16	Zentangle Method and traditional letter	<ul style="list-style-type: none"> • Meditative drawing activity 	<p>Zentangle Method is an art therapy practice that helps the participants be calm, to relax, stay focus and gives stress relieving effects. It improves one's confidence and concentration. In addition to the mental health benefits, the participants also get a fun-looking tile at the end.</p>	<p>In this session, a white sheet was distributed among the participants to do an activity. The activity explained a freehand, using a pencil, lightly to draw a square and then border around the inside edge of the square. Draw a string using a pen or pencil inside the border. According to the Zentangle Method, a string is a curved line or squiggle that will lend structure to one's design. Then start creating a "tangle" which is a pattern drawn in a pen or pencil along the contours of a string. This activity worked as a means to release the pent up emotions such as anger, frustrations, aggression and stress. At the same time, when it becomes a design made it gives a sense of happiness also, that relaxes the mind and the body.</p>

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			<p>This method combines simple drawing techniques with meditative, relaxing therapy enhancing creativity and support a greater freedom of expression.</p> <p>The traditional letter is the key to writing a letter to our own emotions communicating our thoughts and feelings.</p>	<p>The last activity was given to the participants where it is similar to writing a traditional letter. One can start by addressing it to someone-or instance, some feelings. One can, of course, select whichever emotions one feel that are most prominent in their life, but a few common ones they will dig into are hope, fear, ambition, stress and love. To do so, one has to ask oneself intentional questions about how this particular emotion has recently surfaced in their life. Then, write down the answers as though you are taking to the emotion itself. The participants while doing the activity had a self-awareness about their own emotions and feelings, their interactions, relationships, their expressions, questions about how, why and when this emotion has affect them. Writing to themselves about their emotions, they have a sense of belongingness and gave a feeling of relaxation of understanding themselves. (Appendix XIX)</p>

Post data collection: Two weeks of the sensitization programme was concluded for the experimental group, the control (waitlist) group was also given one session of awareness on risk and resilience and the post data collection was carried out. Data from both the experimental and control group were collected to assess levels of risk and resilience involving similar measures used in the pre-sensitization phase in order to enable direct comparisons of the data. Data was collected in two intervals, the post data was collected after a period of 10 days and the follow up data was collected after a period of 30 days of sensitisation programme.

Phase V: Data analysis- Analysing post sensitisation data

Analysing data (post sensitization), applying statistical and logical techniques to illustrate and evaluate data from youth based on their risk behaviours and resilience factors before and after the sensitization (pre, post and follow-up data)

In this phase statistical analysis was used to see the effectiveness of the sensitization programme among the selected youth in the pre, post and follow-up data and the sustenance of the effect of the sensitisation programme. Statistical calculations such as paired sample t test, Cohen's D test, independent t test, and Multivariate Analysis of Variance (MANOVA) were applied to identify the significant differences between the risk behaviours and resilience among the experimental and control groups in their pre and post-sensitization scores.

- A. **Paired sample t test:** paired sample t test analysis examines the within-group differences of a single group, in this study it was used to investigate the efficacy of the sensitization programme at post- sensitization condition. It was done to identify the immediate effect by comparing the means of pre and post sensitization data on the risk and resilience factors.
- B. **Cohen's D:** Cohens d is a standardised effect size for measuring the difference between two related group means. Cohen's D was used to calculate the effect size to quantify the magnitude of change between pre and post-sensitisation scores among the youth following the paired sample t test.

C. **Multivariate Analysis of Variance (MANOVA):** Multivariate Analysis of Variance (MANOVA), is a procedure for comparing multivariate sample means by considering situations where there are multiple response variables. MANOVA enables to explore whether significant differences exist between groups across a combination of dependent variables simultaneously. It was carried out as a procedure for comparing multivariate sample means and to identify the significant mean differences in the scores of risk behaviours and the resilient factors among youth in the pre-data, post-data and follow-up data and measure the proportion of variance of the changes in the dependent variable and measure the impact size.

D. **Independent t test:** The Independent T test is an inferential statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups. The test was used to assess the effect of sensitization programme by identifying the significant differences between the mean scores of risk behaviours and resilience among the experimental and controlled group in pre and post sensitisation.

In summary, the methodology adopted for this study offers a comprehensive framework to investigate the complex interrelationship between risk factors and resilience components among youth. The goal was to seek, understand and explore the measurable factors and the detailed personal stories that influence youth resilience. The selection of diverse participants, the use of validated measurement tools, and ethical considerations tailored to working with young populations enhance the reliability and relevance of the findings. This methodological framework not only supports a robust analysis of risk and resilience patterns but also contributes to the development of targeted sensitisation programmes, interventions and policies that can effectively support at-risk youth in varied contexts.