CHAPTER – 3
RESEARCH DESIGN & METHODOLOGY

3.1 Rationale

With the advent of positive psychology, the focus has now shifted towards positive phenomena i.e. Posttraumatic Growth (PTG). Posttraumatic Growth as a positive phenomenon has been actively studied and verified by many researchers. Though basically the concept is long-standing and written about in many ancient scriptures but the credit for empirical investigation and scientific terminology is a recent endeavor pioneered by Richard Tedeschi & Lawrence Calhoun. Similarly related constructs like benefit-finding, hardiness, resilience and thriving tend to pose a challenge to the validation of posttraumatic growth’s concept.

Diverse variables can predict posttraumatic growth, the few that have been mentioned in the literature i.e. personality characteristics, social support, coping strategies, environmental characteristics, rumination style, spirituality, optimism portray a lack of consensus about them, thus giving a feeling that there can be many more positive variables which need to be explored as predictors of posttraumatic growth.

Following trauma, posttraumatic stress disorder (PTSD) seems to be a very natural response, but literature is abounding with posttraumatic growth studies. Cognitive processing of the traumatic event also predicts posttraumatic growth, therefore if we deepen our understanding of this phenomenon it can be translated into application for counseling trauma survivors.
In the background of clinical psychotherapy, a considerable number of behavioral and cognitive approaches can be put into practice so that survivors get accustomed to deal with their trauma effectively, find and attach meaning to their traumatic event, grow wiser with every traumatic experience, thus contributing to the enhancement of posttraumatic growth.

Focus on the positive transformative processes can help to develop an overall appreciation and quality of life. Insight into PTG and its predictors can help counselors working in this field to develop interventions which can help promote posttraumatic growth. Furthermore, it is beneficial to increase awareness in several health areas and to develop an insight and appreciation of posttraumatic growth to survivor’s family and their respective social support network.

3.2 Objectives of the Study

- To study Posttraumatic Growth in victims of trauma.
- To study the relationship between Sense of Coherence (meaning making) and Posttraumatic Growth.
- To study the relationship between Wisdom and Posttraumatic Growth.
- To study the relationship between Cognitive Emotion Regulation and Posttraumatic Growth.
3.3 Hypotheses

H₁ - There will be a positive relationship between posttraumatic distress and posttraumatic growth in trauma survivors.

H₂ - There will be a positive relationship between sense of coherence and posttraumatic growth in trauma survivors.

H₃ - There will be a positive relationship between wisdom and posttraumatic growth in trauma survivors.

H₄ - There will be a significant relationship between cognitive emotion regulation and posttraumatic growth in trauma survivors.

3.4 Sample of the Study

The total sample for the present study comprised 200 trauma survivors between the ages of 30-50 having 12th as minimum qualification coming from middle socio economic background, living in urban domicile. The time gap between the traumatic event and the inclusion in the study was of 6 months to 2 years. Those with multiple traumas and undergoing any psychiatric treatment were excluded. Trauma victims included victims of the following categories:

1. Diagnosis of a life threatening illness
2. Divorce
3. Death of spouse or child
4. Major accident
5. Natural disaster
6. Sexual assault
7. Physical assault

In the present study, snowball sampling technique (non probability) was used to select the sample.
3.5 Measures of the Study

3.5.1 Impact of Events Scale - Revised (Weiss & Marmar, 1997)

Impact of Events Scale – Revised (IES-R) was prepared by Daniel Weiss & Charles Marmar in the year 1997 to reflect the DSM-IV criteria for Post Traumatic Stress Disorder (PTSD). In this study we use the English revised version of the original scale Impact of Events by Horowitz, Wilner and Alvarez (1979). It is a 22-item self-report measure that assesses subjective distress as a result of a traumatic stressor. The IES-R provides a total score as well as scores on each of its three subscales, namely avoidance, intrusion and hyperarousal.

Avoidance includes response sets like numbing of responsiveness, avoidance of feelings, situations and ideas, lessened interest in important activities, feelings of detachment, limited range of affect & sense of a foreshortened future. Intrusion includes response sets like recurrent thoughts, nightmares, intrusive feelings and imagery, dissociative-like re-experiencing, flashback episodes, intense distress and physiological reactivity at exposure to stimuli, illusions or hallucinations. Hyperarousal includes response sets to trauma like outbursts of anger, irritability, hypervigilance, difficulty concentrating, heightened startle, difficulty falling or staying asleep (APA, 2000).

Scoring and Range – The items of IES-R scale is on a 5-point Likert scale that ranges from 0 (Not at all) to 4 (Extremely). The avoidance subscale score is the total of 8 items, namely items 5, 7, 8, 11, 12, 13, 17 and 22. The intrusion subscale score is the total of 8 items, namely items 1, 2, 3, 6, 9, 14, 16 and 20. The hyperarousal subscale score is the total of 6 items, namely items 4, 10, 15, 18, 19 and 21. The
total IES-R score is obtained by adding all responses, and subscale scores by adding responses to items comprising the subscale. The total IES-R score has a probable range of 0 to 88, with higher total scores indicating presence of PTSD symptom severity in an individual.

Many researchers like (Pooley et al., 2012; Fourie, 2000) have used this scale across various samples like residents of Northwest Australia seasonally threatened and affected by cyclones, employees working in bank and police sectors reporting high alpha values i.e. 0.96 (Pooley et al., 2012) for the total scale. For the subscales high alpha values ranging from (0.73 to 0.92) Fourie, (2000) have been reported.

3.5.2 Sense of Coherence Scale (Antonovsky, 1983)

Sense of Coherence Scale (SOC) was developed by Aaron Antonovsky in the year 1983 to enhance the understanding of the concept termed “Salutogenesis” (Antonovsky, 1979). It is also known as Orientation to Life questionnaire. In this study we use the English version of the 29 item multi dimensional scale. The scale measures how an individual views life and manages resources in stressful conditions while staying positive and healthy. The SOC scale provides a composite score as well as scores on each of its three subscales, namely comprehensibility, manageability and meaningfulness.

*Comprehensibility* is the degree of confidence that individuals have in themselves from which they make sense of the stimuli approaching from their internal and external environment. *Manageability* is the degree of confidence that an individual has in self of the resources available to respond to the demands placed on them. *Meaningfulness* is the degree to which individuals recognize that their life,
and the demands or challenges that are placed on them, have meaning and as such are worthy enough to emotionally, cognitively and physically invest in them.

**Scoring and Range** – The items of SOC scale are on a 7-point semantic differential with two anchoring phrases at each extreme. The comprehensibility subscale score is the total of 11 items, namely items 1, 3, 5, 10, 12, 15, 17, 19, 21, 24 and 26. The manageability subscale score is the total of 10 items, namely items 2, 6, 9, 13, 18, 20, 23, 25, 27, and 29. The meaningfulness subscale score is the total of 8 items, namely items 4, 7, 8, 11, 14, 16, 22 and 28. Thirteen of the items, namely items 1, 4, 5, 6, 7, 11, 13, 14, 16, 20, 23, 25 and 27 are formulated negatively and as such are to be reverse scored. The total SOC score is obtained by adding all responses, and subscale scores by adding responses to items comprising the subscale. The total SOC score has a probable range of 29 to 203, with higher total scores indicating strong sense of coherence in an individual.

Many researchers like (Fourie, 2000; Forstmeier, 2009; Walsh, 2011; ) have used this scale across various samples like employees working in bank and police sector, German ex-soldiers of World War II, undergraduate students reporting high alpha values i.e. 0.94 (Fourie, 2000); 0.87 (Forstmeier, 2009); for the total scale. For the subscales high alpha values ranging from (0.66 to 0.75) Forstmeier (2009); (0.84 to 0.93) Walsh (2011) have been reported.

### 3.5.3 Three-Dimensional Wisdom Scale (Ardelt, 2003)

Three-Dimensional Wisdom Scale (3D-WS) was developed by Monika Ardelt in the year 2003 to assess the multidimensionality and the multiple facets of wisdom. In this study, we use the English version of the 39 items scale. The scale
evaluates wisdom also known as “expertise in the conduct and totaling of life” (Baltz & Staudinger, 2000 p.124); “a form of advanced cognitive functioning” (Dittmann-Kohli & Baltz, 1900 p.54). The 3D-WS provides a global score as well as scores on each of its three subscales, namely cognitive, reflective and affective.

“Cognitive” dimension of wisdom refers to a person’s ability to understand life that is to comprehend the importance and totaling of events and phenomena, particularly with regard to matters that are intrapersonal or interpersonal in nature. This also includes knowledge of the positive and negative aspects of human nature, of the inherent limits of knowledge, and of life’s unpredictability and uncertainties. Reflective dimension of wisdom refers to a person’s skill to overcome subjectivity and projections by looking at phenomenon and events from different perspectives and how much they avoid blaming other people or circumstances for their present situation. Affective dimension of wisdom refers to a person’s capability to assess the presence of positive emotions and behavior towards other beings, such as feelings and act of sympathy and compassion, and the absence of indifferent or negative emotions and behavior towards others” (Ardelt, 2003).

Scoring and Range – The items of the 3D-WS is on a 5-point Likert scale that ranges from 1 (Definitely true of myself) to 5 (Not true of myself) for 24 items and 15 items have the range from 1 (Strongly Agree) to 5 (Strongly Disagree). The cognitive subscale score is the total of 14 items. The reflective subscale score is the total of 12 items. The affective subscale score is the total of 13 items. Eight items are reverse scored. The total 3D-WS score is obtained by adding all responses and subscale scores by adding responses to items comprising the subscale. The total 3D-
WS score has a probable range of 39 to 195, with higher total scores indicating superior levels of wisdom and understanding.

Many researchers like (Neff et al., 2007; Le, 2011; Bergsma & Ardelt, 2012) have used this scale across various samples like undergraduate students, European-American adults, Dutch internet users reporting high alpha values i.e. 0.85 (Neff et al., 2007); 0.82 (Le, 2011); 0.75 (Bergsma & Ardelt, 2012) for the total scale. For the subscales high alpha values ranging from (0.67 to 0.72) Neff et al. (2007) and (0.66 to 0.74) Bergsma & Ardelt (2012) have been reported.

3.5.4 Cognitive Emotion Regulation Questionnaire (Garnefski et al., 2001)

Cognitive Emotion Regulation Questionnaire (CERQ) was prepared by Nadia Garnefski and Vivian Kraaij in the year 2001 to identify the cognitive emotion regulation strategies an individual employs when faced with negative episodes in life. In this study we use the original English version of the 36 items multidimensional questionnaire. It is a self report questionnaire that measures individual’s thoughts and emotions after having experienced a traumatic event. The CERQ provides scores on each of its nine subscales, namely self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive re-appraisal, putting into perspective, catastrophizing and blaming others.

Self-blame refers to thinking about blaming oneself for what one has experienced. Acceptance refers to thinking of enduring the experience and accepting what has happened to self. Rumination or focus on thought refers to constant thinking and reflecting about the feelings and thoughts generated by the traumatic event. Positive refocusing refers to thinking about positive events in place of
thinking about the negative event. *Refocus on planning* refers to thinking and understanding about what measures to take and how to come in terms with the traumatic event. *Positive reappraisal* refers to thinking of conferring an affirmative totaling to the event which will in turn enhance self development. *Putting into perspective* refers to thinking of reducing the serious gravity of the event by looking at it in relation to other events. *Catastrophizing* refers to thinking of explicitly laying emphasis on the fearful experience. *Blaming others* refers to thinking about blaming the environment or the another person for what one has experienced.

**Scoring and Range** – The items of CERQ scale is on a 5-point Likert scale that ranges from 1 (*Almost Never*) to 5(*Almost Always*). The scale contains nine conceptually distinct subscales each consisting of four items, which makes a total of 36 items. The self-blame subscale comprises 4 items, namely items 1, 10, 19 and 28. The acceptance subscale comprises 4 items, namely items 2, 11, 20 and 29. The rumination subscale comprises 4 items, namely items 3, 12, 21 and 30. The positive refocusing subscale comprises 4 items, namely items 4, 13, 22 and 31. The refocus on planning subscale comprises 4 items, namely items 5, 14, 23 and 32. The positive re-appraisal subscale comprises 4 items, namely items 6, 15, 24 and 33. The putting into perspective subscale comprises 4 items, namely items 7, 16, 25 and 34. The catastrophizing subscale comprises 4 items, namely items 8, 17, 26 and 35. The blaming others subscale comprises items, namely items 9, 18, 27 and 36. The total score on each subscale score is obtained by adding responses to items comprising that subscale. Each subscale score has a potential range of 4 to 20 and the subscale scores cannot be added to get a total score. The higher total score of each subscale indicates more frequent usage of a particular cognitive emotion regulation strategy.
Many researchers like (Garnefski et al., 2008; Losiak & Nikiel, 2014; Schroevers et al., 2011; Min et al., 2013) have used this questionnaire across various samples like heart patients, cancer patients, depression and anxiety patients reporting high alpha values 0.80 (Losiak & Nikiel, 2014) and 0.86 (Min et al., 2013) for the total scale. For the subscales high alpha values ranging from (0.76 to 0.88) Garnefski et al. (2008) and (0.63 to 0.88) Schroevers et al. (2011) have been reported.

3.5.5 Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996)

Posttraumatic Growth Inventory (PTGI) was developed by Richard Tedeschi & Lawrence Calhoun in the year 1996 to reflect the concept of Posttraumatic Growth as seen in the 5 domains of life. In this study, we use the original English version of the 21 item multi factor scale. The scale assesses the extent of self reported positive outcomes as a result of the experience of a traumatic event. The PTGI provides an aggregate score as well as scores on each of its five subscales, namely new possibilities, relating to others, personal strength, appreciation of life, spiritual change.

New Possibilities in an individual refers to develop a sense of new opportunities in life that have come to light as a result of traumatic experience. Relating to others refers to building stronger relationships with family, friends and sometimes also with people who suffer similar trauma. Personal strength refers to increase in one’s own convictions, beliefs and strengths as a result of traumatic event. Appreciation of Life refers to higher awareness and understanding of
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importance of one’s own life. *Spiritual change* refers to deepening of spiritual aspects and a certain positive spiritual change in some individuals post trauma.

**Scoring and Range** – The items of PTGI scale is on a 6-point Likert scale that ranges from 0 (*I did not experience the change as a result of my crisis*) to 5 (*I experienced this change to a very great degree as a result of my crisis*). The new possibilities subscale score is the total of 5 items, namely items 3, 7, 11, 14 and 17. The relating to others subscale score is the total of 7 items, namely items 6, 8, 9, 15, 16, 20 and 21. The personal strength subscale score is the total of 4 items, namely items 4, 10, 12 and 19. The appreciation of life subscale comprises of 3 items, namely items 1, 2 and 13. The spiritual change subscale comprises of 2 items, namely items 5 and 18. The total PTGI score is obtained by adding all responses, and subscale scores by adding responses to items comprising the subscale. The total PTGI score has a probable range of 0 to 105, with higher total scores indicating escalating growth intensity post trauma.

Many researchers like (Forstmeier et al., 2009; Pooley et al., 2012; Shi et al., 2015; Dekel et al., 2012, Kashdan & Kane, 2011) have used this inventory across various samples like German ex-soldiers of World War II, residents of Northwest Australia seasonally threatened and affected by cyclones, military medical students, Israeli ex-prisoners of war, college students reporting high alpha values 0.93 (Forstmeier et al., 2009), 0.96, (Pooley et al., 2012), 0.89 (Shi et al., 2015), 0.94 (Dekel et al., 2012), 0.93 (Kashdan & Kane, 2011) for the total scale. For the subscales high alpha values ranging from 0.70 to 0.88 (Forstmeier et al., 2009), 0.93 (Dekel et al., 2012) have been reported.
3.5.6 Demographic Questionnaire

A demographic questionnaire was prepared which included basic details like name, age, gender, domicile, educational qualification and occupation. A separate column indicating the category of trauma with the defined time limit, information on multiple traumas and psychiatric treatment (ongoing) or taken in the past was also mentioned.

3.6 Design of the Study

Posttraumatic Distress

Sense of Coherence

Wisdom

Cognitive Emotion Regulation

POSTTRAUMATIC GROWTH
3.7 Operational Definitions

**Posttraumatic Distress** – *Posttraumatic Distress* or PTSD, “is an anxiety problem that develops in some people after extremely traumatic events, such as combat, crime, an accident or natural disaster. People with PTSD may relive the event via intrusive memories, flashbacks and nightmares; avoid anything that reminds them of the trauma; and have anxious feelings they didn’t have before that are so intense their lives are disrupted.” (APA, 2000)

**Sense of Coherence** – *Sense of Coherence* is defined as “a global orientation that expressed the extent to which one has a pervasive, enduring though dynamic feeling of confidence that one’s internal and external environments are predictable and that there is a high probability that things will work out as well as can reasonably be expected.” (Antonovsky, 1979, p. 123)

**Wisdom** – *Wisdom* as a virtue has many definitions. An apt definition of wisdom is “the transformation of intrapersonal, interpersonal & transpersonal experiences in the domains of personality, cognition and conation.” (Achenbaum & Orwoll, 1991, p.21). Wisdom is portrayed as a combination of cognitive, reflective and affective components established on earlier endeavors by Clayton & Birren (1980) in the current study.

**Cognitive Emotion Regulation** – *Cognitive Emotion Regulation* is described as “the conscious, cognitive way of handling the intake of emotionally arousing information and can be considered part of the broader concept of emotion regulation.” (Garnefski et al., 2001, p. 141).
**Posttraumatic Growth** – *Posttraumatic Growth* can be termed as “positive psychological change experienced as a result of the struggle with highly challenging life circumstances.” (Calhoun & Tedeschi, 1999, 2001, p.160).

### 3.8 Procedure

The study was conducted in two phases:

In the first phase, based on the criteria of inclusion, the sample of the study was contacted for the purpose of data collection.

In the second phase, the tools of the study were administered on the selected sample.

### 3.9 Statistical Analysis

#### 3.9.1 Mean

Mean is defined as the sum of all the values of the items in a series divided by the number of items. It is the simplest but most useful measure of central tendency. It is represented by the symbol \( M \).

**Formula:**

\[
M = \frac{\sum X}{N}
\]

where \( N \) is the total number of measures in the series,

\( X \) stands for a score or other measure, and

the symbol \( \sum \) means “sum of”, here sum of separate measures.

#### 3.9.2 Standard Deviation

The Standard Deviation or SD of a set of scores is defined as the square root of the average of the squares of the deviations of each score from the mean. SD is
regarded as the most stable index of variability and is customarily employed in experimental work and in research studies. It is often called root mean square deviation and is denoted the Greek letter sigma $\sigma$.

Formula: $\sigma = \sqrt{\frac{\sum (x - M)^2}{N}} = \sqrt{\frac{\sum x^2}{N}}$

where, $X$ – Individual score

$M$ – Mean of the given set of scores

$N$ – Total No. of the scores

$x$ – Deviation of each score from the mean.

### 3.9.3 Correlation

Correlation can be defined as a measure of degree and direction of relationship between two variables. When the relationship between two sets of scores or variables can be represented graphically by a straight line, it is known as *linear correlation*. For expressing the degree of relationship quantitatively between two sets of measures or variables, help of an index known as *coefficient of correlation* is taken. It is a kind of ratio which expresses the extent to which changes in one variable are accompanied by changes in the other variable.

*Product moment method*, one of the two methods used for computing coefficient of linear correlation is also known as *Pearson’s correlation coefficient*. It is named after the inventor of this method Karl Pearson and is symbolically represented by $r$. 
Formula: \( r_{XY} = \frac{\sum xy}{N \sigma_x \sigma_y} \)

where, 
- \( r_{XY} \) – Correlation between X and Y (two sets of scores)
- \( \chi \) – Deviation of any X-score from the mean in test X
- \( y \) – Deviation of the corresponding Y-score from the mean in test Y
- \( \sum xy \) – Sum of all the products of deviation (each \( \chi \) deviation multiplied by its corresponding \( y \) deviation)
- \( \sigma_x \) – Standard deviation of the distribution of scores in test X
- \( \sigma_y \) – Standard deviation of the distribution of scores in test Y
- \( N \) – Total number of scores of frequencies

3.9.4 Regression

Regression can be defined as a process that allows making reliable predictions about variable “Y” based on the knowledge we have about variable “X” and vice versa. In a scatter diagram of the scores of two variables, if we try to compute the means for each of the columns, we find that they all lie on a straight line. Similarly, the means for each of the rows may also be found to fall nearly in a straight line. Each of these straight lines is known as the line of regression.

One of these regression lines is linked with the regression of Y variable on X variable and is represented by the equation

Formula: \( \frac{Y - M_Y}{\sigma_x} = r \sigma_y (X - M_x) \)

This equation helps predict the score value of Y variable in correspondence with any value of the X variable.
The other regression line is linked with the regression of X variable on Y variable and is represented by the equation

Formula: \( \frac{X-M_x}{\sigma_y} = r\sigma_x(X - M_y) \)

This equation helps to predict the score value of X variable in correspondence with any value of the Y variable.

In these equations, X and Y alternately represent a given score and a score to be predicted. Mx and My represent means for the X and Y variables, \( \sigma_x \) and \( \sigma_y \) represent the values of standard deviations for the distributions of X and Y scores, and r represents Pearson’s r for the variables X and Y.

In this way, there are two regression equations, one for the prediction of scores on Y variable and the other for the prediction of scores on X variable.

3.9.5 Multiple Regression

Multiple Regression is a powerful statistical technique used for predicting the unknown value of a variable from the known value of two or more variables also called as predictors. By multiple regression, we mean models having relationships with just one dependent and two or more independent (exploratory) variables. The variable whose value is to be predicted is called as the dependent variable and the ones whose known values are used for prediction are known as independent (exploratory) variables. The purpose of multiple regression is to find a linear equation that can best determine the value of dependent variable Y for different values of independent variables in X.

Formula: \( Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots \ldots \ldots + bNX_N \)
The value of $b_1$ is the slope of regression line of $Y$ against $X_1$. Same is the case with $b_2$, $b_3$ and so on. These values are then used to minimize the difference between actual and expected value of $Y$. The difference gives rise to another parameter called *Coefficient of multiple regression* ($R^2$) whose value can range from 0 (for no relationship between $X_i$ & $Y$) to 1 (perfect relationship between $X_i$ & $Y$). Only those independent variables with high values of $R^2$ are included in the equation of multiple regression.

SPSS 17 was used to conduct all the statistical analysis used in hypothesis testing.