CHAPTER 3
METHODOLOGY

The present study aims to investigate the moderating effect of psychological capital on reactions to stress. This chapter gives a detailed account of the research method used to carry out the study. The description of various methodological aspects has been presented under various headings:

- Sample
- Measuring Instruments
- Administration and scoring of the measures
- Statistical Analyses

Sample:

The sample of the study consisted of 400 (172 males and 228 females) participants from Delhi, National Capital Region (NCR) and Haryana. Of 400, Sample comprise of 84 (51 males, 33 females) students; 94 (32 males, 62 females) Teachers; 92 (38 males, 54 females) Health Care Professionals (HCPs); 80 (51 males, 29 females) in service and 50 Housewives. The sample was drawn using random sampling from various institutions and organisations such as Amity University Noida, Guru Jambheshwar University Hisar, Govt. P. G. College Hisar, Vaish College Bhiwani, Vaish Sr. Sec. School Bhiwani, Govt. schools of Hisar and Bhiwani, L.I.C. of India Hisar, various hospitals of Haryana and NCR. The age of the participants ranged between 18 and 65 years. The education of both male and female participants ranged from higher secondary to doctorate degree. The participants belonged to varied socio-economic backgrounds ranging from lower middle to higher classes. The table (i) below provides the detailed distribution of sample:
Table (i): Distribution of sample

<table>
<thead>
<tr>
<th>Profession</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>32</td>
<td>62</td>
<td>94</td>
<td>23.5%</td>
</tr>
<tr>
<td>Health Care Professionals (HCPs)</td>
<td>38</td>
<td>54</td>
<td>92</td>
<td>23%</td>
</tr>
<tr>
<td>Students</td>
<td>51</td>
<td>33</td>
<td>84</td>
<td>21%</td>
</tr>
<tr>
<td>Service</td>
<td>51</td>
<td>29</td>
<td>80</td>
<td>20%</td>
</tr>
<tr>
<td>Housewives</td>
<td>-</td>
<td>50</td>
<td>50</td>
<td>12.5%</td>
</tr>
<tr>
<td>Total sample</td>
<td>172</td>
<td>228</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

Measuring Instruments:

Psychological Capital – The following four separate measures i.e. self-efficacy, hope, optimism, and resiliency were used to measure psychological capital:

Hope Scale

The Hope Scale is a 12-item measure of a respondent’s level of hope. It was developed by Snyder, Harris, Anderson, Holleran, Irving, Sigmon, Yoshinobu, Langelle and Harney (1991). The purpose of the scale was to assess respondent's level of hope. The scale is divided into two subscales that comprise Snyder's cognitive model of hope: (1) Agency (i.e., goal-directed energy) and (2) Pathways (i.e., planning to accomplish goals). Out of the 12 items, 4 make up the Agency subscale and 4 make up the Pathways subscale. The remaining 4 items are fillers. Each item is answered using an 8-point Likert-type scale ranging from Definitely False to Definitely True. Item numbers 2, 9, 10, and 12 make up the agency subscale (e.g. I energetically pursue my goals, My past experiences have prepared me well for my future, I've been pretty successful in life, I meet the goals that I set for myself). Item numbers 1, 4, 6, and 8 make up the
pathway subscale (I can think of many ways to get out of a jam, There are lots of ways around any problem, I can think of many ways to get the things in life that are important to me, Even when others get discouraged, I know I can find a way to solve the problem). The scale can be scored for two subscales as well as for total scale. Using an 8-point continuum, scores can range from a low of 8 to a high of 64 for the total hope score and scares can range from a low of 4 to a high of 32 for the subscales.

The alpha coefficient for scale is .80 for several studies; moreover, the four agency items load principally on one factor and the four pathways items load principally on another. Likewise, the dispositional hope scale has evidenced construct and discriminant validity through several studies (Snyder et al., 1991).

**General Self-efficacy Scale (GSE)**

General Self-efficacy Scale is a 10-item scale designed to assess a general sense of perceived self-efficacy and to assess optimistic self-beliefs used to cope with a variety of demands in life. The scale was originally developed by Jerusalem and Schwarzer in 1981 in Germany and has been translated into many languages. Subjects were asked to respond for self-efficacy, i.e., the belief that one's actions are responsible for successful outcomes, on a four point continuum (1 = not at all true, to 4 = exactly true), such that scores can range from a low of 4 to a high of 40. Higher scores indicate stronger belief in self-efficacy.

Studies have shown that the GSE has high reliability, stability, and construct validity (Leganger et al., 2000; Schwarzer, Mueller, & Greenglass, 1999). The scale was found to be configurally equivalent across 28 nations, and it forms only one global dimension (Leganger et al., 2000; Scholz et al., 2002). Cronbach alpha ranges from 0.75 to 0.94 across a number of different language versions (Rimm & Jerusalem 1999; Luszczynska et al., 2005). Relations between the GSE and other social cognitive variables
(intention, implementation of intentions, outcome expectations, and self-regulation) are high and confirm the validity of the scale (Luszczynska et al., 2005). The scale's alpha reliability is reported 0.85 by the author. Criterion-related validity is documented in numerous correlation studies where positive coefficients were found with favourable emotions, dispositional optimism, and work satisfaction. Negative coefficients were found with depression, anxiety, stress, burnout, and health complaints.

Research and clinical use - Consisting of only 10 items, the GSE is easy to administer and interpret. The scale measures one global dimension of self-efficacy with high reliability and validity.

14-item Resilience Scale (RS-14)

The RS-14 was developed by Wagnild (2009) and consists of 14 items. The scale is intended to assess the capacity to withstand life stressors, to thrive and make meaning from challenges. Each item is rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The total score range from 14 to 98. This short form of the scale is an offshoot of the 25 items scale and measures similar psychological concept.

The original 25-item Resilience Scale (RS) was developed by Wagnild and Young (1993) to evaluate the levels of resilience in the general population. The RS is a reliable and valid tool to measure resilience that has been used with a wide range of study populations and regarded as the best assessment method to evaluate resilience in the adolescent population, due to good psychometric properties and applications in a variety of age groups (Ahern et al., 2006; Wagnild, 2009). The short version of the RS (RS-14) was developed to provide clinicians and researchers a shorter instrument to reduce participant’s burden.

The Cronbach's alpha coefficient for the scale is 0.81. The internal consistency of the RS-14 has been reported to be excellent (α = .93) and it correlates strongly (r = .97) with the original RS (Wagnild, 2009). The
factor analysis of the RS-14 resulted in one strong factor solution (Wagnild, 2009) which was also found in a later study (Nishi et al., 2010). The RS-14 has shown similar negative correlations with depression and anxiety (Abiola & Udofia, 2011), and positive correlations with self-actualization and stress management (Wagnild, 2009) as the original RS.

The scale has content and constructs validity demonstrated by Wagnild (2009). The RS-14 is strongly concurrent correlated with the RS (r=.97, p<.001) and moderately correlated with depressive symptoms (r=-.41) and life satisfaction (r=.37) (Wagnild & Young, 1993). A study was conducted to determine the reliability and validity of RS and RS-14 in Nigerians as a tool that can assess protective factors or resources (Nishi, Uehara, Kondo, & Matsuoka, 2010). They found resilience as measured by both the RS and RS-14 to be negatively correlated with both depressive and anxiety symptoms.

**Life Orientation Test – Revised (LOT-R)**

The Life Orientation Test – Revised (LOT-R) was developed by Scheier, Carver and Bridges in 1994. The scale consists of 10 items and purports to assess individual differences in generalized optimism versus pessimism. This measure has been used in a good deal of research on behavioural, affective and health consequences of the Optimism/Pessimism dimension.

LOT-R is a revised version of the original LOT (Scheier & Carver, 1992). The original LOT had 12 items: 4 worded positively, 4 worded negatively, and 4 fillers. In LOT-R, there are 10 items, out of these four are filler items and six are scale items where 3 items measure optimism and 3 items measure pessimism. Every item on the LOT-R is just an easy explanation of a symptom of either optimism (In uncertain times, I usually expect the best) or pessimism (I hardly ever expect things to go my way).

Respondents are asked to indicate their level of agreement with each of the items on a 4-point scale, using the response format, “strongly agree” to
“strongly disagree”. Each symptom item has five possible answer choices: 0 = strongly disagree (I disagree a lot), 1 = disagree (I disagree a little), 2 = neutral (I neither agree nor disagree), 3 = agree (I agree a little), and 4 = strongly agree (I agree a lot). The test includes three positively worded and three negatively worded items (these are reverse coded). Items 3, 7, and 9 are reverse scored (or scored separately as a pessimism measure). Items 2, 5, 6, and 8 are fillers and should not be scored. This gives a possible range of 0-24, with higher scores indicating more optimism. For each assessment, there is a scoring algorithm leading to one of the three acuity ranges: low, moderate or high. A total score of ‘19-24’ indicates ‘High Optimism’; score of ‘14-18’ indicates ‘Moderate Optimism’ and a total score of ‘0-13’ indicates ‘Low Optimism’.

Cronbach’s alpha for the entire 6 items of the scale was .78, suggesting the scale has an acceptable level of internal consistency for LOT-R for an undergraduate sample. The internal reliability coefficients for subscales were .62 (Optimism) and .78 (Pessimism). The test-retest correlations were .68, .60, .56 and .79, suggesting that the scale is stable across time.

**Perceived Stress Scale (PSS)**

The Perceived Stress Scale was developed by Cohen, Kamarck and Mermelstein (1983). It consists of 10 items to measure participants’ appraisal of situations in their life as stressful perceived in last one month. In each case, respondents are asked how often they felt a certain way. The items are simple and very easy to understand and the response alternatives are even easy to catch and understand. Further, the questions are simple and of general nature and relatively, they are free of content associated to any population group.

To assess the degree to which people perceive their lives as stressful, respondents are asked to indicate how often they have found their lives
unpredictable, uncontrollable, and overloaded in the previous month (e.g., How often have you been upset due to something that happened suddenly?, “In the previous month, how often have you were nervous and “stressed”?”). These items assess the frequency of stressful events that occurred in the past month on a scale from 1 (never) to 5 (very often). Each item has 5 possible answers choice: 0 = Never; 1 = Almost Never; 2 = Sometimes; 3 = Fairly often; 4 = Very often. PSS-10 scores are received by reversing the scores on the four items, 4, 5, 7, and 8 e.g., 0=4, 1=3, 2=2, etc. and then adding all 10 items. A higher total score indicates more stress.

The scale demonstrated good internal consistency (Cronbach’s alpha = .78) and was predictive of psychological symptoms, physical health symptoms, and use of health care services. Researchers have demonstrated that the Perceived Stress Scale (PSS) can be used to determine if stress is an etiological risk factor in disorders or disease (Cohen et al., 1983). As far as validity is concerned, PSS correlates in a predicted way with other measure of stress such as Job Responsibilities Scale and life events scales.

**Daily Hassles scale**

The daily hassles scale was developed by Lazarus and Folkman in 1989 and consists of 117 items. It was developed to measure the frequency and severity of a person's transactions with the environment that are considered by the person to be stressful events. Respondents are asked to indicate the severity of the daily hassles as they have faced in the past month. The scale takes roughly 5-10 minutes to complete. It can be administered individually or in group setting. The simplicity of the directions and item wording makes the instrument easy to self-administer. For the Daily Hassles Scale respondents use the following four-point scale: 0 = none or did not occur, 1 = somewhat severe, 2 = moderately severe, 3= extremely severe.

To determine the stability of the hassles scores, scores from each successive pair of time periods in the Kanner et al. (1981) study were
correlated and then averaged over the nine month period. Hassles
frequency score were quite stable over this time period \( r = .79 \),
suggesting that hassles scores have both trait and state characteristics,
each reflecting, empirically and theoretically, a different side of the same
coin. The average of the correlations between monthly frequency scores \( r 
= .79 \) was significantly higher than the average monthly severity scores \( r 
= .48 \). This difference may have resulted from the fact that, although
overall hassles frequency showed considerable stability over time, subjects
may not have endorsed the same hassles item from month to month.

Preliminary data comparing the daily hassles scale with the hassles
portion of the combined hassles and uplifts scale show modest but
significant correlation between the two scales. In an unpublished study
with 64 college students, correlation between the two scales was .43 for
frequency and .54 for severity. Mean frequency for hassles on the
combined scale was 21.69, with the standard deviation of 7.25; and mean
severity was 1.61, with the standard deviation of .37. A correlation of .60
between the two scales with a large sample of 448 subjects and also fairly
similar relationships with psychological symptoms and somatic health for
the two scales were reported.

**Bell Adjustment Inventory (BAI)**

Bell Adjustment Inventory was developed by Bell (1961) which comprises
of 160 items. It is a self-reporting questionnaire in ‘yes’, ‘no’ or ‘?’ format to
measure the total level of adjustment (Here ‘adjustment’ refers to
‘maladjustment’). This test can be used as screening tool for the poorly
adjusted persons, college and university students and adults. There are
two forms: one for students (grade 9 through college) and one for adults.
Respondents are asked to indicate the level of adjustment in their lives. It
measures the five areas of personal and social adjustment i.e. home, health,
social, emotional, and occupational. Home adjustment is expressed in
terms of satisfaction or dissatisfaction with home life, Health adjustment in terms of illness and poor health condition, social adjustment in terms of shyness, submissiveness, introversion; Emotional adjustment in terms of depression, nervousness, phobia and pathological anxiety and Occupational adjustment in terms of persons adaptation to their work. The administration of this scale takes 40-45 minutes. The scores were obtained by using scoring stencils. Low scores are indicative of better adjustment, except in case of social subscale where high scores are indicative of better adjustment. However, total score was considered for the present study where high score indicate poor adjustment and low scores reflect more adjustment.

The reliability coefficients varied from .72 to .92 for various areas of adjustment determined by different methods. Both internal consistency and the temporal-stability of the inventory were determined by using odd-even reliability with Spearman-Brown formula and test-retest technique. The test-retest reliability ranges between .81 and .88; Split-half reliability ranges between .82 and .92 for different dimensions and total adjustment scores. Cross validation of the scale with K. Kumar’s adjustment inventory resulted in Pearson’s r of .72, .79, .82 and .81 for home, health, social and emotional areas respectively.

**Beck Depression Inventory-II (BDI-II)**

BDI-II is a 21-item self-report instrument which was developed by Beck, Steer and Brown in 1996. It purports to measure presence and severity of depression in psychiatrically diagnosed adults and adolescents 13 years of age and older. This latest revised edition replaces the BDI and the BDI-1A. It includes items which are intended to index symptoms of severe depression, which would need hospitalization. In BDI-II, Items show increase or decrease in sleep and appetite, items which were labelled body image, work difficulty, weight loss, and somatic preoccupation were
changed and replaced with items labelled agitation, concentration difficulty and loss of energy. The BDI-II takes just 5 minutes to complete and it is more clinically sensitive than ever. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression. These new items of BDI-II are in alignment with DSM-IV criteria. Current DSM-IV guidelines require assessing depression symptoms over the previous two weeks. The time frame for the response set in the new edition was changed from one week to two to comply.

The coefficient alphas in case of BDI-II (.92 for outpatients and .93 for college students) were higher than of the BDI-1A (.86). Test-retest reliability was studied using the responses of 26 outpatients who were tested at first and second therapy sessions with one week difference. There was a correlation of .93, which was significant at p < .001. In relation to construct validity, the convergent validity of the BDI-II was calculated by administration of the BDI-1A and the BDI-II to two sub-samples of outpatients (N=191). The presentation order was counterbalanced and at least one other measure was administered in-between the two versions of the BDI, yielding a correlation of .93 (p<.001) and means of 18.92 (SD = 11.32) and 21.888 (SD = 12.69) the mean BDI-II score being 2.96 points higher than BDI-1A. This is a valid instrument and has the coefficient of correlation from .47 to .71 for varied criterion measures.

**Beck Anxiety Inventory (BAI)**

The Beck Anxiety Inventory has been developed by Beck and steer (1993). It is a well-accepted and renowned self-report measure of anxiety in case of adults for use in both clinical and research settings. It consists of 21 multiple-choice items which are used to measure the severity of an individual’s anxiety. As the items in the BAI explain the emotional, physiological, and cognitive symptoms of anxiety but not depression, so it can differentiate anxiety from depression. Although the age range for the
measure is between 17 to 80 years, even though, it can be used with adolescents with 12 years and above. Each of the items of BAI is an easy explanation of a symptom of anxiety in one of its four presented aspects: (1) subjective, (2) neurophysiologic, (3) autonomic or (4) panic-related. It requires only a basic reading level, which can be used with individuals with intellectual disabilities, and which can be completed in 5 - 10 minutes using the pre-printed paper form and pencil. Respondents are questioned the extent to which the item on the scale bothers to them. Every symptom item has four possible answers: not at all; mildly (It did not bother me much); moderately (It was very unpleasant, but I could stand it), and; severely (I could barely stand it).

The scale is psychometrically approved and its internal steadiness (Cronbach’s alpha) ranges from .92 to .94 for adults and test-retest (one week interval) reliability is .75. Synchronized validity with the Hamilton Anxiety Rating Scale, Revised is .51. The construct validity for state and trait anxiety subscales was found .58 and .47, respectively. The BAI has also been expressed to hold acceptable reliability and convergent and discriminate validity for both 14-18 year inpatients and outpatients.

**Aggression Questionnaire (AQ)**

AQ is a popular measure of aggression in adults. The questionnaire was developed by Buss and Perry (1992). It is a 29 items questionnaire which measures 4 dimensions of aggression i.e. Physical Aggression (9 items), Verbal Aggression (5 items), Anger (7 items) and Hostility (8 items). Out of four dimensions, anger was used in the present study. From this questionnaire, seven items (e.g. sometimes I fly off the handle for no good reason, I have trouble controlling my temper, I am sometimes eaten up with jealousy) were used to measure anger. Participants are asked to respond certain statements along a 5-point continuum from "0 = extremely uncharacteristic of me", 1 = uncharacteristic of me, 2 = neither
characteristic nor uncharacteristic of me, 3 = characteristic of me, 4 =

extremely characteristic of me. Sum of item no. 15, 16, 17, 18, 19, 20 and
21 gives the total score for anger. Overall score range, 29-145 and Anger
aggression scale range 7-35 with a higher score indicates high anger.

One sample of 372 subjects was tested twice, the interval being 9 weeks.
The test-retest correlations were as follows: Physical aggression, .80;
Verbal Aggression, .76; Anger, .72; and Hostility, .72 (total score = .80). For
scales with a relatively small number of items, these coefficients suggest
adequate stability over time. The correlations of aggression scales,
particularly the dimension of anger with various personality traits are:
Emotionality (.43); Activity (.22); Impulsiveness (.42); Sociability (.08);
Assertiveness (.40); Competitiveness (.32); Public self-consciousness (.16);
Private self-consciousness (.03); and Self-esteem (.14), respectively.

**Administration and scoring of the measures**

As there are 10 scales used in the present study, so, all the measuring
instruments were taken together to make one questionnaire and were
administered in two settings to cope with elements of fatigue. All the
instruments were designed and formatted in a simple manner with clear
instructions written on the top of the each scale. The instructions and
administration procedures were same for all the subjects, and in
accordance with that describe by the respective test authors. Optimal font
size was used to give the participants an ease to fill and complete the
questionnaires. After getting consent from the participants, questionnaires
were distributed and clear instructions were given to them. A good rapport
was established with them in order to get real position on the measuring
instruments. They were told about the importance of the study and that
the data collected will not be made public, rather confidentiality of their
responses will be maintained. Subjects were informed that their position
on different behavioural measures would be intimated to them, if they
desire so.
The general testing conditions were satisfactory and atmosphere was uniform all through. Subjects were encouraged to respond in a realistic way without rumination on all tests too much. An optimal time was provided to complete the questionnaires however participants were suggested to give their first response for the questions. For the present study, data was collected both in group and individual settings. After the successful administration of tests and data collection, all the questionnaires were scored using appropriate scoring keys.

For ‘The Hope Scale’, scoring is done by summing up all the items of the scale to obtain a total score. Using an 8-point continuum, scores can range from a low of 8 to a high of 64 for the total hope score. In ‘General Self-efficacy Scale’, subjects respond on a four point continuum (1 = not at all true, to 4 = exactly true). Scoring is done by summing up all the 10 items such that scores can range from a low of 4 to a high of 40. In ‘RS-14’, each item is rated on a 7-point Likert scale, adding all the items we get a total score ranging from 14 to 98. In Life orientation test-revised (LOT-R), respondents are asked to indicate their level of agreement with each of the items on a 4-point scale. The test includes three positively worded and three negatively worded items (these are reverse coded). Items 3, 7, and 9 are reverse scored (or scored separately as a pessimism measure). Items 2, 5, 6, and 8 are fillers and should not be scored. This gives a possible range of 0-24, with higher scores indicating more optimism. For each assessment, there is a scoring algorithm leading to one of the three acuity ranges: low, moderate or high. A total score of ‘19-24’ indicates ‘High Optimism’; score of ‘14-18’ indicates ‘Moderate Optimism’ and a total score of ‘0-13’ indicates ‘Low Optimism’.

The total scores of the Perceived Stress Scale (PSS) were obtained by summing up all the items, with items number 4, 5, 7, and 8 were reversed-scored. Higher scores reflected higher and longer duration of stress. For Daily life – hassles scale, scoring is accomplished by summing all the scores
for 117 items and obtaining a total score of severity of daily hassles. In this way, the score can range 0-351. Total score of zero would mean no hassle and total score of 351 would mean extremely severe hassle for the person in the past month.

For, ‘Beck Anxiety Inventory’, using a four-point continuum, the values for each item is added up to yield the total score for all 21 symptoms that can range in-between 0 to 63 points. The score of 0 - 7 is interpreted as a "Minimal" level of anxiety; 8 - 15 as "Mild"; 16 - 25 as "Moderate", and; 26 - 63 as "Severe". In the same way, for ‘BDI-II’, every item is rated on a 4 point scale ranging in-between 0 to 3 in terms of severity. The scores are obtained by summing up all the 21 items in the scale. The total score of 0-13 is considered minimal range, 14-19 is mild, 20-28 is moderate, and 29-63 is severe.

Bell Adjustment Inventory has five different measures of personal and social adjustment viz. home, health, social, emotional and occupational adjustment. One point is given to every 'yes' responses. Scoring is done with the help of scoring key. The scores obtained in each areas like home, health, social, emotional and occupational were added together to determine the total level of adjustment. Higher score indicates lesser adjustment in the particular area. Lower score would mean that the respondent is well-adjusted and a higher would mean that he/she is poorly-adjusted. For the scoring of dimension of Anger in Buss and Perry aggression questionnaire, sum of item no. 15, 16, 17, 18, 19, 20 and 21 was done that gives the total score for anger. Overall score range, 29-145 and Anger aggression scale range 7-35 with a higher score indicates high anger. Scored data was analysed and results were interpreted for the present study.

**Statistical Analyses**

The obtained data were subjected to various statistical analyses. It was analysed for descriptive statistics, Pearsonian inter-correlations, and
Moderated hierarchical regression to examine the moderating effects of psychological capital. Moderated regression is an extended application of multiple regression analysis wherein independent and moderator variables can be entered in different equation blocks with an automatic control over the inflative effects of initially entered independent variables. It was used to assess the interactive effect between Stress and psychological capital (Hope, self-efficacy, resilience and optimism) and whether or not such an effect is significant in predicting reactions to stress (Depression, Anxiety, Adjustment and Anger). The first step of hierarchy (block-1) entered with stress, four constructs of Psychological Capital as predictors of reactions to stress. The second step of the hierarchy (block-2) was entered with the interactive products of stress and psychological capital domains as moderators of reactions to stress.