CHAPTER-IV
DESIGN AND
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The main aim of the present study is to investigate the relationship of positive health to certain intelligence, aptitudes and attitudes. It is a correlational study. Researchers frequently distinguish between experimental studies and correlational studies when they discuss different research methods. An experimental study typically involves experimenter-produced changes in one variable in order to observe the effects on a second variable, while a correlational study focuses attention on the relationship between two variables without either of them being altered by the experimenter. A correlational study can, however, establish whether two variables tend to be related to each other or not. The obvious problem with experimental studies is that they require a high degree of cooperation by subjects in order to produce changes in variables and in order to control extraneous variables. Typically, this kind of cooperation is not feasible in health related studies. Further experimental studies are limited in the number of variables they can consider.

The present study is by necessity an exploratory one. It looks at an area where little previous research has been done in India, and therefore, the format of the correlation study best fits the data wished to obtain. The correlational approach makes it possible to look at a number of psychological variables related to health and this is the crucial factor as far as the purpose of this study is concerned. Looking at all the relationships, specified in the aims of the study, with an experimental approach, would require many studies- studies which may or may not be necessary in the future, depending upon the information that can be supplied in only one correlational study.

The present investigation was intended to study the intelligence as a correlate of positive health. The following design and methodology were used to fulfill the objectives of the study:

Design:

This investigation was planned to study intelligence as a correlate of positive health. For this purpose, a correlational research design was used to find out whether there is any relationship between various types intelligence and different dimensions of positive health.
Sample:

For the present study, a sample of 300 educated working adults (male ~ 170 and female ~ 130) was selected from four cities of Haryana (Rohtak, Bhiwani, Faridabad, Hissar), Chandigarh and Delhi, on the basis of non-random sampling procedure. The selected sample consisted of the respondents from various professions like teachers, bank employees, doctors, engineers, advocates, university employees, shopkeepers. The age range of the sample was 20 to 60 years.

Instrumentation:

Having selected the sample the next task was to choose suitable tools for measuring personality traits, aptitudes and attitudes – as mentioned earlier in chapter 2. The selection of the tools for a particular study depends on various considerations, such as objective of the study, nature of the sample, the amount of time at the investigations disposal, availability of suitable tests, personal competence of the investigator to administer, score and interpret the best results.

After carefully reviewing tests and inventories, the following tests were chosen for the study because of the thorough developmental process to which they had been subjected and because they had been found to be reasonably reliable. Among the other factors taken into consideration in the selection of the tests were:

1. the efficiency of the test;
2. ease in administration and scoring;
3. the educational level for which the test was best suited;
4. the content of the test;
5. the suitability of the test to the objectives of the research.

Following tools were used in the present investigation:

i) Personal data blank sheet

ii) Tools for the assessment of Intelligence

- Standard progressive matrices
- Emotional intelligence scale
- Social Intelligence Scale

iii) Tools for the assessment of positive health

- General health questionnaire
- Body mass index
- Spiritual health scale
- 29-Oxford Happiness scale
• Satisfaction with life scale
• Life orientation test-revised

i) Personal Data blank sheet:

This consist of information regarding the subject’s name, age, sex, educational qualification, employment status, marital status etc. (Appendix-C)

ii) Tools for the assessment of Intelligence

- Standard progressive matrices

Raven’s Standard Progressive matrices (SPM), published in 1938, was designed as a measure of spearman’s ‘g’ factor. The Standard Progressive Matrices (Raven, Court and Raven, 1983) was used to measure the general intelligence of the subjects. In the words of Raven (1960), “It is a test of a person’s capacity at the time of the test to apprehend meaningless figures presented for his observation to see the relations between them, conceive the nature of the figure completing each system of relations presented and by so doing, develop a systematic method of reasoning.”

The scale consist of 60 problems divided into five sets of 12 (sets A, B, C, D, and E). In each set the first problem is as nearly as possible self-evident. The problems which follow become progressively more difficult. From each matrices or design, a part has been removed. The subject chooses the missing part from given alternatives. SPM is relatively culture free test (Anastasi, 1976). It can be given individually or in groups. SPM can be used as an untimed “capacity” test and even as a 20-minute “speed” or “efficiency” test. The progressive matrices has been described as one of the purest and the best measure of ‘g’ or general intellectual functioning available (e.g. spearman, 1938; Vernon, 1942, 1947).

Anastasi (1976) remarks “correlation of RPM with both verbal and performance tests of intelligence range between .40 and .75, tending to be higher with performance than with verbal tests. On the whole RPM appears to have considerable promise for a number of testing purposes.”

- Emotional intelligence scale

Emotional intelligence (EI) is relatively new area of research in the Indian context. Emotional intelligence is linked to personal and social competence (Goleman, 1995), academic and social success (Davies Stankov and Roberts, 1998) and individual as well as team effectiveness in organizations (Abraham, 1999;
EI also refers to intra- and inter-personal intelligence (Gardner, 1983). There are two major conceptualizations of EI – (a) ability model – that includes four sets of skills, such as, 'perception and appraisal of emotion, assimilation of basic emotional experiences into mental life, understanding and reasoning about emotions and management and regulation of emotion in oneself and others' (Mayer and Salovey, 1997), and b) mixed model that includes intra and inter personal skills, adaptability, stress management and general mood (Bar on, 1997). Emotional intelligence has a basis in the cultural construction, as culture provides beliefs about emotional states, a vocabulary for discriminating them and a set of socially acceptable attributes for the states (Ashforth and Humphrey, 1995).

To measure this construct, a version of emotional intelligence scale suitable for Indian workplace, prepared by Bhattacharya, Dutta and Mandal (2004) was selected. It consists of 40 items which were selected from a pool of items from various scales/inventories that were available for the measurement of EI like MEIS by Mayer and Salovey (1999) and Emotional Intelligence scale by Schutte, Malouff, Hall, Haggerty, Copper, Golden and Dormheim (1998). The pool of 130 items was submitted to a panel of 5 experts who were requested to select items based on the construct to emotional intelligence and suitability of items in the cultural construct. The process yielded 49 items. These items were then administered to 101 subjects, who were asked to answer each item on a 5-point likert type scale ranging from never true to always true. Based on their responses a inter-correlation matrix was prepared and submitted to a principal component factor analysis followed by varimax method of rotation. The analysis yielded five factors with 40 items.

The items in factor I indicated about 'appraisal of negative emotions' while items in factor II indicated about “appraisal of positive emotions”. ‘Interpersonal conflict and difficulties’ were reflected in the item structure of factor III. Interpersonal skills and flexibility’ were reflected in the item structure of factor IV. Factor V had item related to ‘emotional facilitation and goal orientedness’. Factor I and Factor II measured appraisal of negative and positive emotions in self-referential manner. Whereas appraisal of self in interpersonal context was measured through items clustered in Factor III and Factor IV.
In this scale 20 items are positive and other 20 items are negative. Items are to be answered on a five point scale ranging from never true to always true, with a possible range of scores from 40 to 200. Scoring weights were 5, 4, 3, 2, 1 for negative items and 1, 2, 3, 4, 5 for positive items. A high score indicates high emotional intelligence. In order to determine the reliability of the scale the Indian version of the scale was administered twice on a group of 62 managers interspersed by a duration of 2 weeks. The test-retest reliability was 0.94 (alpha coefficient 0.87). The correlation (r=0.75), between Indian version of the scale and schutte emotional intelligence scale, indicate the validity of this scale (Bhattacharya, Dutta and Mandal, 2004).

Social Intelligence Scale

To measure the subject’s social intelligence, Social intelligence scale (SIS) developed by N .K. Chadha and Usha Ganesan, 1986 was used. The scale consist of 66 items covering 8 dimensions of social intelligence. The 8 dimensions were selected on the basis of judgment of 25 experts in the field of behavioural sciences.

The description of these 8 dimensions is given below:

i) Patience – calm endurance under stressfull situation.

ii) Co-operativeness – Ability to interact with others in a pleasant way; to be able to view matters from all angles.

iii) Confidence level – Firm trust in oneself and ones chances.

iv) Recognition of social environment – Ability to perceive the nature and atmosphere of the existing situation.

v) Tactfulness – Delicate perception of the right thing to say or do.

vii) Sense of humour – capacity to feel and cause amusement; to be able to see the lighter side of life.

viii) Memory – ability to remember all relevant issues, names and faces of people.

The six dimensions (patience, confidence, co-operativeness, sensitivity, sense of humor and recognition of social environment) gives the subject a choice of three alternatives for each item and is asked to choose one. In case of first four dimensions (patients, co-operativeness, confidence and sensitivity) scores of 1, 2, and 3 are given to three response alternatives. For example in the confidence dimension a score of 3 indicates a high degree of confidence and a score of 1 a lack of confidence. In the
other two dimensions (sense of humor and recognition of social environment) one of the three alternative given is the appropriate response. This response when given was allotted a score of 1. In case of the 'Tactfulness' dimension the responses were in the form of 'Yes' or 'No'. The appropriate response was awarded a score of '1'. The last dimension that of memory was scored '1' or '0' depending on whether or not the subject’s response was right or wrong. A high score indicates high social intelligence.

Chadha and Ganesan (1986) reported that their scale had test-retest correlation coefficients, for each dimension, ranged from 0.89 to 0.96 and the split half correlation coefficients ranged from 0.84 to 0.97. In order to determine the validity of the test the coefficient of correlations were computed between scores of the SIS and social intelligence test by F.A. Moss, Hunt, Omwake and Wood-Ward (1949). The present scale has a validity Coefficient of .70. (Chadha and Ganesan, 1986)

iii) Tools for the assessment of Positive health

Researches, nowadays, argue that health is simply not absence of disease. It is something positive, joyful, cheerful, enjoyable and productive life. Therefore, positive health may be considered as a multidimensional construct, which involves many domains like physical health, psychological health, spiritual health etc. The usual method of measuring positive health or well being is through self-report surveys in which the respondent himself judges and reports his life satisfaction, the frequency of his pleasant emotions usually the researchers use simple one time self-reports which may consist of single-item or multiple-item scales. However, recent measures contain multiple items. Although psychometric properties of these scales tend to be strong, they provide only one approach to assessing positive health. Hence to incorporate most of the dimensions of this holistic approach to health, a battery of positive health measures was constituted with the selection of following tools:

a) General health questionnaire –12 (Goldberg and Hillier, 1979)
b) Body mass index
c) Spiritual health scale (Nevid, Rathus & Rubenstein, 1998)
d) 29-item Revised Oxford Happiness Scale (Argyle, 2001)
e) Satisfaction with life scale (Diener, Emmons, Larson and Griffin, 1985)
f) Life orientation test-revised (Scheier, Carver and Bridges, 1994).
a) General health questionnaire –12 (Goldberg and Hillier, 1979)

The present investigation included the general health questionnaire – 12 or as popularly known GHQ-12 (Goldberg and Hillier, 1979) – a short screening test for non-psychiatric disorder, to assess mental health. The GHQ-12 is a self administered screening test, designed to identify short-term changes in mental health (depression, anxiety, social dysfunction and somatic symptoms). It is a pure state measure, responding to how much a subject feels that their present state “over the past few weeks” is unlike their usual state. It does not make clinical diagnoses and should not be used to measure long-standing attributes rather the GHQ focuses on the client’s ability to carry out “normal” functions and the appearance of any new disturbing phenomena. In the present investigation, the GHQ is used only as a screener for current psychological problems, rather than to diagnose psychiatric disorders. The GHQ-12 (Goldberg, 1972) asks about psychological symptoms over the previous few weeks. It does not attempt to provide a specific diagnosis of anxiety or depression. As such, it attempts to identify different levels of distress, rather than conduct detailed mental health assessments. The specific areas covered in the GHQ are depression, anxiety and social dysfunction. Designed for use by doctors, psychiatrists and researchers, the GHQ is an ideal tool for use in community and non-psychiatric settings.

The GHQ-12 is very quick to administer and score as it contains only 12 questions. Nonetheless, it is just as reliable, valid and sensitive as its other longer versions. The reliability and validity of GHQ-12 are well established (Banks, Clegg, Jackson, Kemp, Stafford and Wall, 1980; Goldberg and Hillier, 1979; and Goldberg 1972). The items of GHQ are to be rated on a four point scale with a scoring weight of 0 to 3. Thus, the total score may range from 0 to 36. The results produce a single score that makes it an excellent resource for research studies. Higher the score better is general and psychological health and vice versa. Mohal (1991) prepared the Hindi version of this questionnaire. As it was available and the subjects of the present study were proficient in Hindi also, therefore, Hindi version of the questionnaire was used in the present study.
b) Body Mass Index:-

Body mass index (BMI) or Quetelet Index is a statistical measure of the weight of a person scaled according to height. It was invented between 1830 and 1850 by Belgian polymath Adolphe Quetelet during the course of developing "social physics". Body mass index is defined as the individual's body weight divided by the square of their height. The unit of measure is kg/m². BMI provide a simple numeric measure of a person's "fatness" or "thinness", which allow health professionals to discuss over – and under-weight problems more objectively with the patients. The BMI categories used by WHO for adults are as follows: a BMI of 18.5 to 24.9 may indicate optimal weight; a BMI lower than 18.5 suggests the person is underweight while a number above 25 may indicate the person is overweight, a number above 30 suggests the person is obese.

The researches in this field suggest that lower and higher BMI significantly indicate the impaired health related quality of life (Ford, Moriaty, Zack and Chapmen, 2001), worse physical functioning and physical well being (Yan, Daviglus, Liu, Pirzada, Garside, Schiffer, Dyer and Greenland, 2004). Brown, Dobson and Mishra (1998) reported that low and high BMI are associated with poor mental health. Risk of hypertension is reported to be higher among individual with overweight and obesity-BMI ≥25kg/m² (Tesfaye, Nawi, Minh, Byass, Berhave, Bonita and Wall, 2007). Also, lower and higher BMI cut-off are associated with different health problems such as diabetes, cancer, sexual functioning. Thus, in the present study BMI was used as an indicator of general overall health.

c) Spiritual health scale (Nevid, Rathus & Rubenstein, 1998)

Spiritual health scale is a sub-scale of Life style and Habits Questionnaire (Nevid, Rathus and Rubenstein, 1998). The questionnaire examine's life style and habits with respect to various dimensions of health and health related health concerns, such as spiritual health, environmental health social health, exercise and physical fitness. Spiritual health scale consist of 8 items and the respondents were asked to answer each item by using 4-point scale ranging from never to always. Possible obtained scores range from 8 to 32 (0 = never, 1 = sometimes, 3 = usually, 4 = always).
d) 29-item Revised Oxford Happiness Scale

To assess the happiness of the subject, the 29-item revised oxford happiness scale (Argyle, 2001) was used. The scale contains 29 items or group of statements about personal happiness. Each group has four statements (a, b, c & d) and the subject is asked to pick out the one statement that best describes the way he/she was feeling. The scoring weights were 0, 1, 2, 3 for a, b, c, and d statements respectively. So, the total score may range from 0 to 87. This sophisticated multi-item scale has good reliability and validity (Carr, 2004).

This test is derived from its predecessor, the 20-item oxford happiness inventory (Argyle, Martin and Crossland, 1989). Hills and Argyle (2002) developed the 29-item oxford happiness questionnaire (OHQ) to be “an improved instrument” to assess subjective well-being (SWB). They improved the oxford happiness inventory by changing the response format from a 0-3 multiple choice scoring format to more widely used Likert Scale. Argyle report acceptable construct validity for the OHQ by providing data on correlation with other self-report scales of SWB. The other assess the cognitive appraisal component of happiness. However, in contrast to other measures, the OHQ makes the error of including additional items that capture a diffuse range of positive character traits and attributes (Kashdan, 2004).

Cruise, Lewis and Mc Gukin (2006) reported that internal consistency, reliability and temporal stability of oxford happiness questionnaire-short form (Hills and Argyle, 2002) was satisfactory. Internal consistency at both time 1 (alpha = 0.62) and time 2 (alpha = 0.58) separated by two weeks was satisfactory.

e) Satisfaction with life scale

Satisfaction with life scale, SWLS, (Diener, Emmons, Larson and Griffin, 1985) was used to assess the life satisfaction of the subjects. This scale contains five items requiring a general evaluation of the respondents life as a whole on a 7-point scale ranging from strongly disagree to strongly agree. So, the total score may range from 5 to 35. Scores on SWLS can be interpreted in terms of absolute as well as relative life satisfaction. A score of 20 represents the neutral point on the scale, the point at which the respondent is about equally satisfied and dissatisfied. Following is the scores' description:-
<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9</td>
<td>Extremely dissatisfied with life</td>
</tr>
<tr>
<td>10-14</td>
<td>Dissatisfied</td>
</tr>
<tr>
<td>15-19</td>
<td>Slightly dissatisfied</td>
</tr>
<tr>
<td>20</td>
<td>Equally satisfied / Equally dissatisfied</td>
</tr>
<tr>
<td>21-25</td>
<td>Slightly satisfied</td>
</tr>
<tr>
<td>26-30</td>
<td>Satisfied</td>
</tr>
<tr>
<td>31-35</td>
<td>Extremely satisfied with life</td>
</tr>
</tbody>
</table>

Diener, Emmons, Larson and Griffin (1985) reported that their scale had a test-retest correlation coefficient of 0.82 (over a two month period) and a coefficient alpha of 0.87. Their factor analysis of the inter-item correlation matrix identified a single factor accounting for 66% of the variance.

Satisfaction with life scale was found to be brief, highly reliable and valid tool to tap life satisfaction. Hence, this tool was selected for the present study.

f) Life orientation test-revised:

To assess the degree of optimism of the subjects, Life orientation test-revised (LOT-R, Scheier, Carver and Bridges, 1994) was used. Using a 5-point Likert-type scale the respondents are required to indicate the extent of their agreement with each item using the following response format: strongly agree to strong disagree. The LOT-R is a short instrument consisting of 10 items, of which 6 items (3 items are positive and 3 items are negative) are scored for overall optimism score and the remaining 4 items are filler items and are ignored for the purpose of calculating the individual’s score. For the present study only 6 items were used, ignoring filler items. All the items were scored 5-4-3-2-1 for strongly agree – agree – unsure – disagree – strongly disagree, except items, 2, 4, and 5 which are scored in the reversed direction.

Scheier, Carver and Bridges, 1994 reported sound convergent and discriminant validity for the LOT-R. Cronbach’s alpha scores, as a measure of reliability used in the development of the LOT-R, pointed toward high internal-consistency reliability. In respect of internal consistency, Scheier, Carver and Bridges (1994) report that item-scale correlations ranged from 0.43 to 0.63. These correlation, they said, suggest that “each item is partially measuring the same
underlying construct, but not such an extent as to be redundant with other items.” They also note that the items all appear to add equivalently to Cronbach’s alpha. Cronbach’s alpha for all six items was 0.78, reflecting an acceptable level of internal consistency. Test-retest reliability was reported as 0.68 (4 months), 0.56 (24 months) and 0.79 (28 months), (Scheier, Carver and Bridges, 1994). Scheier Carver and Bridges, (1994) also reported a high correlation between the original LOT and the revised instrument (r=0.90’s). As for whether the LOT-R should be scored in bi-polar fashion, using one overall score; or, whether two separate scores should be computed, one for the positively worded items and one for the negatively-worded items; they started that the data indicates that optimism and pessimism may be treated as bi-polar. However, their position is to rely on an overall score for primary positively and negatively-warded items separately (Scheier, Carver and Bridges, 1994) for the purpose of this study only the overall LOT-R Score will be used as an indicator of optimism.

**Procedure**

The present investigation was conducted to find out the correlation between intelligence and positive health. To fulfill this purpose, SPM, Emotional intelligence scale, social intelligence scale and a battery of positive health (comprising of 29-revised oxford happiness scale, LOT-R, GHQ-12, Spiritual health scale, SWLS and BMI) were administered on 300 educated adults of 20 to 60 years of age.

All the subjects of the study were approached personally. The tests were administered either individually or in small groups of 2-3 individuals. Investigator introduced himself as research scholar of Department of Psychology, M.D. University, Rohtak. The subjects were told in advance about the possible time/day involved in the study and only volunteer subjects were taken into account. While establishing the rapport with the subject, it was especially ascertained that this particular subject has not undergone any major and significant life change during the preceding two months. Such subjects, who undergone any such change, were excluded from the study since their particular life circumstances could effect their scores on the measures of positive health.
The selected subject was requested to answer frankly and honestly as the information provided by him/her was to be kept confidential and would only to be used for research purposes.

Secondly, to reduce the effect of fatigue on the performance of the subjects, the tests were presented in random order. Instructions regarding each test/tool were explained at the time of administration. All the tests were paper-pencil tests and instructions for each test were provided separately on the first title page.

When the subject(s) was (were) comfortable and ready for testing, the following general instructions were given to subject(s), “I am going to give you a set of questionnaires in which there are questions regarding your personal data, general health and behaviour. The detailed instructions regarding each of the questionnaires are on the top of the first page of the questionnaire. Please read them carefully as they concern to you.”

After giving the general instructions regarding the testing, the selected test(es) was (were) administered after ensuring that the subject has understood the method of reply. After the completion of administration, the test (s) was (were) taken back and it was ensured that the subject(s) had (had) responded each item and in correct way. The presentation of these tests in random order was highly taken care of following the testing session, the subject’s height and weight were also measured. The subject was duly thanked for his/her cooperation.

Data of all the subjects was collected by applying the same procedure. Generally one subject took about 40 minutes to complete the SPM, 20-25 minutes for emotional intelligence scale and social intelligence scale each and 30 minutes for the positive health battery. After the data collection was over, all the tests/ questionnaires were scored as per the scoring patterns prescribed by their authors and/or manuals.

The obtained data were subjected to statistical analyses using SPSS software. Pearson product moment correlations and multiple regression analyses were applied to the data.

We may now pass on to the next chapter dealing with the results and discussion.