CHAPTER III

METHODOLOGY

This chapter contains a description of the methodology conducted for this study. Non-experimental survey approach was used to investigate the relationship of emotional intelligence, health related physical fitness and career decision making within convenience samples of junior college students in Maharashtra. Although standard procedure was followed to conduct this study, this chapter describes the *method of research, nature of the design, population and sample, tools used for research, apparatus or instruments employed, statistical tools and procedures,* systematically.

3.1 Research Design

The present research study goes through a method of survey research. In fact, survey is a method of research that involves systematic compilation, explanation, analysis, and reporting of relevant facts concerning an enterprise, an institution(s) and a population and / or some aspects thereof. The basic rationale is to establish present practices and conditions or the effectiveness of the enterprise in order to provide guidance in the justification of development of present status. Survey studies portray and infer that “exists” and how researcher could deduce things in order to suggest change alteration or improvement in the existing practices. A survey is essentially concerned with prevalent conditions, or relationships. Comparison is another underlying objective behind these status studies. Descriptive survey may also be called an assessment study, which aims to describe the status of a phenomenon at a particular point of time. No value judgment is given on the prevailing situations under description. This technique, in fact, has been adopted in this study. Thus, the present research study goes through a method of descriptive research involving survey, correlation and prediction.

Following attempts were made to minimize the invalidating effects:

- A large number of participants represented
- Completion of the study in as close a time frame as possible,
- Protocol used to ensure the administration of the questionnaires was similar and to monitor the time it took to complete the questionnaire.

3.2 Methods

3.2.1 Population

The students, having age group between 16 to 19 years, studying in the disciplines of science, arts and commerce at higher secondary/ junior colleges located in nine different Divisional Boards of Maharashtra have been considered as population for this study. The target population for the year 2013-14 is about 13,46,305 students. The Divisional Board-wise total population in Maharashtra is as follows:

Table 3.1
Population of HSC* students in Maharashtra during 2013-14

Divisional Boards	Year of Foundation	Districts include in the division	HSC* No of Schools / Jr. Colleges	No of students
Pune	1966	Pune , Ahemadnagar, Solapur	1038	2,13,996
Nagpur	1966	Nagpur, Bhandara, Chandrapur, Wardha, Gadchorali, Gondia	1171	1,76,550
Aurangabad	1966	Aurangabad, Beed, Parbhani, Jalana, Hingoli	1050	1,27,374
Mumbai	1985	Mumbai, Thane, Raigad	954	3,12,717
Kolhapur	1991	Kolhapur, Satara, Sangali	588	1,19,015
Amravati	1991	Amaravati, Akola, Bhuldana, Yeatmal, Vashim	1185	1,46,052
Nashik	1993	Nashik, Dhule, Jalgaon, Nandurbar	739	1,52,177
Latur	1997	Latur, Nanded, Usmanabad	586	6,8999
Kokan	2011	Ratnagiri, Sindhudurg	170	2,9425
			7,481	**13,46305**

*HSC: Higher Secondary Council

3.2.2 Sample

Maharashtra is a very large state consisting of 9 Divisional Boards. Since the researcher cannot move towards whole of Maharashtra, he randomly selected three educational or Divisional Boards viz., Amravati, Kolhapur and Pune.

Further, the researcher listed total number of Junior colleges located in the jurisdiction of the educational zones of Amravati, Kolhapur and Pune and selected 20% of the colleges (from science, arts and commerce subjects) from each educational zone considering the principles of Fisher's table random sampling.

The blue print of participation of students is presented in following table (Table 3.2):

Table 3.2
Blue print of subjects' participation

Educational zones in Maharashtra (Total Schools/ Jr. Colleges)	**20% of the schools/ Jr.Colleges contacted**	**Number of School/Junior Colleges** (allowed for data collection)	**No. of subjects**					
			Arts		**Commerce**		**Science**	
			Boys	Girls	Boys	Girls	Boys	Girls
Amravati Divisional Board (**1185 schools**)	237	82	748	612	1255	940	742	859
Kolhapur Divisional Board (**588 schools**)	117	65	405	435	898	772	615	576
Pune Divisional Board (**1038 schools**)	207	74	672	570	1028	892	695	786
TOTAL			**1825**	**1617**	**3181**	**2604**	**2052**	**2221**
			3442		**5785**		**4273**	
GRAND TOTAL			**13,500**					

The sample students were asked to volunteer to complete the questionnaires. The participants were informed that participation is voluntary and they were asked to sign two consent forms that provided information of the study: one consent form remained with the institution's head and the second was kept with the researcher.

Finally, 13,500 participants from junior colleges situated in three selected zones completed the questionnaires.

The inclusionary criteria applied were in compliance with valid data within the target population:

- The subjects who were registered in an junior college.
- Age ranged between 16-19 years.
- More than 80% of items completed for each scale.

For this study, participants were excluded from this study for the following reasons:

- 81 participants were over the age of 19 years,
- 17 participants failed to respond to program demographic items,
- 52 participants failed to respond to more than 40% of the items on a number of scales.

3.2.3 Variables

Since this study intended to examine the relationship between emotional intelligence, health related physical fitness and career decision making of junior college students in Maharashtra, the main variables included were:

- Emotional Intelligence,
- Career Decision Making, and
- Health Related Physical Fitness.

3.2.4 Tools used and Criterion Measures

The variables stated above were assessed by employing following tools with proper criterion measures:

Table 3.3
Variables, tools used and criterion measures

No.	Variables	Tools Used	Criterion Measures
1.	Emotional Intelligence	Questionnaire (Mangal and Mangal, 2012)	Points
2.	Career Maturity Inventory	Questionnaire (Gupta, 2011)	Points
3.	Health Related Physical Fitness	Questionnaire (Bera, 2009)	Points

3.2.5 Details of Questionnaires Used

1. Emotional Intelligence Inventory

Emotional intelligence inventory has been designed to measure emotional intelligence (total as well as separately) in respect of four areas or aspects of emotional intelligence namely, ***Intra-personal Awareness*** (knowing about one's own emotions), ***Inter-personal Awareness*** (knowing about others emotions), ***intra-personal management*** (managing one's own emotions) and ***inter-personal management*** (managing others emotions) respectively of students for 16 + years age (Table 3.4).

Table 3.4

Areas or Aspects of Emotional Intelligence Inventory

Sr. No.	Area/Aspect	No. of Items
1.	Intra-personal Awareness (Own emotions)	25
2.	Inter-personal Awareness (others emotions)	25
3.	Intra-personal Management (own emotions)	25
4.	Inter-personal Management (others emotions)	25
	Total of Items	100

The questionnaire has 100 items, 25 each from the four areas to be answered as yes or no. While constructing items for each of these areas due care was taken to make use of the simple language and provide well defined purposeful statements to the respondents for the assessment of their emotional intelligence.

Development of the Questionnaire

In the beginning a list of 180 items was prepared. The list was presented to a group of 5 judges and only those items were retained about which the judges were unanimous on their retention. It led to the elimination of 30 items out of 180. The remaining 150 items were subjected to item analysis.

Item Analysis

Item analysis was carried out by computing biserial correlation of each item - 1) with the total scores on the inventory and 2) with the area total scores. The significance of a biserial correlation at 0.01 level was fixed as the criterion for retaining an item. This led to the elimination of 48 items. Later on,

two more items seeming somewhat alike and weak in nature were also dropped in view of keeping equal number of items i.e. each in all the four areas or dimensions of emotional intelligence inventory.

Standardization

The final test of 100 items was administered on a large sample of 2200 (1050 males and 1150 females) students 16+ years age.

This sample was drawn by stratified proportionate cluster random sampling technique from the population of the students studying in - 1) XII class of the higher secondary schools of Haryana state affiliated to board of school education Haryana or CBSE, 2) colleges including engineering, and B.Ed. colleges affiliated to M.D. University, Rohtak. The distributions of the scores of the subjects of both sexes in respect to the total inventory as also of the four separate areas of the inventory were tested for the normality by applying chi square test. The test upheld that the distributions were not departing significantly from normality.

Reliability

Reliability of the inventory was examined through three different methods, namely –

1. Split half method using Spearmon Brown prophecy formula
2. K-R formula
3. Test-retest method (after a period of 4 weeks)

The reliability coefficients derived through these tests are given in following table (Table 3.5):

Table 3.5

Reliability coefficient of emotional intelligence inventory

Methods used	n	Reliability Coefficient
Split half	600	0.89
K-R formula	600	0.90

Test-retest	200	0.92

Validity

The validity for the inventory has been established by adopting two different approaches, namely factorial and criterion related approach.

Factorial Approach

For adopting factorial approach inter-correlations among the four areas of the inventory were calculated. The results revealed that correlations among the four areas of the inventory vary from 0.437 to 0.716 (after testing these correlations at the 0.01 level -2 tailed, it was found that all were significant). Thurston's centroid method of factor analysis was employed and after the extraction of second centroid actor from the first residual matrix, it was amply proved that the four areas of the emotional intelligence inventory are quite interrelated and inter dependent among themselves.

Criterion related approach

Two different external measures used for this purpose were 1) adjustment inventory for college students developed by AKP Sinha and R.P. Singh and 2) Emotional maturity scale developed by Yasvir Singh and Mahesh Bhargava.

In both these measures the lower scores tend to represent favorable result i.e. good adjustment and higher level of emotional maturity while in the case of present emotional intelligence inventory it goes in the opposite direction i.e. providing lower level of emotional intelligence.

The validity coefficients (the product moment correlation coefficients obtained between total scores on emotional intelligence inventory and adjustment inventory as well as emotional maturity scale) obtained through these two measures is 0.662 and 0.613 respectively.

Classification of Emotional Intelligence Scores into Categories

For a rough estimation and quick interpretation of the emotional intelligence scores earned by an individual student attempts were also made for providing a five fold categorization. It was done by dividing the base line of the normal curve into five equal units being equal to 1.2. The classification of emotional intelligence on the basis of total scores is presented in following table (Table 3.6):

Table 3.5

Criterion validity of emotional intelligence inventory

Categories	Description	Range of Scores	
		Female	Male
A	Very Good	88 & above	90 & above
B	Good	75-87	77-89
C	Average	61-74	63-76
D	Poor	48-60	49-62
E	Very Poor	47 & below	48 & below

Scoring Procedure

The mode of response to each of the item of the inventory is in the form of a forced choice i.e. either yes or no, indicating complete agreement or disagreement with the proposed statement respectively. In the present emotional intelligence inventory thus there are item where the response yes is indicative of the presence of emotional intelligence and no for the lack of emotional intelligence. Similarly, there are items where no response provides clue for the presence of emotional intelligence and yes for its absence. For scoring one mark into be provided for the response indicating presence of emotional intelligence and zero for the absence of emotional intelligence.

Table 3.6
Scoring process of emotional intelligence inventory

Items	Mode of Response	Score
S. No. of items (where 'yes' response shows presence of intelligence) 6,18,19,20,23 to 25, 27 to 29, 31, 41 to 44, 51 to 56, 58 to 68, 70, 71, 73 to 76, 79 to 82, 84, 88 to 90, 96, 99	'Yes' 'No'	1 0
S. No. of items (where 'no' response shows presence of intelligence) 1 to 5, 7 to 17, 21, 22, 26, 30, 32 to 40, 45 to 50, 57, 69, 72, 77, 78, 83, 85 to 87, 91 to 95, 97, 98, 100	'No' 'Yes'	1 0

2. Career Maturity Inventory (CMI)

The concept of career maturity has its origin in the developmental theory of career behavior which envisages that selection of an occupation is a process spanning a considerable number of years usually from late childhood to early adulthood. The process even continues after the person establishes in an occupation and makes efforts to maintain and advance in it and later in life prepares to retire from it. Career maturity is the term which denotes the place reached on this continuum of career development from early exploratory years to decline. This process of career development has been further analyzed as unfolding through several distinct but unrelated factors. These include:

1. Consistency of career choice,
2. Realism of career choice in relation to personal capabilities and employment opportunities,
3. Career choice attitudes, and
4. Career choice competencies.

The career maturity inventory has been conceived and constructed to measure the maturity of attitudes and competencies that are critical in realistic career decision making. To assess the maturity of these career behaviours, the CMI provides two types of measures: the attitude scale and the competence test.

The attitude scale elicits the feelings, the subjective reactions, the dispositions that the individual has toward making a career choice and entering the world of work. Is work seen as a meaningful focus of life or is it viewed as drudgery? How involved and independent is the individual in the choice process? What considerations are made in selecting a career? These and other conative aspects of decision making are stated in the items of the attitude scale as they have actually been verbalized by young people. Five attitudinal variables being surveyed by attitude scale are:

1. Decisiveness in career decision making,
2. Involvement in career decision making,
3. Independence in career decision making,
4. Orientation to career decision making, and
5. Compromise in career decision making.

The scale, thus, maps the conative aspects of decision making. The competence test measures the cognitive variables in choosing an occupation. These include appraisal of the individuals job related capabilities (strengths and weaknesses), knowledge about the world of work, aptness in matching personal characteristics to occupational requirements, foresight in planning for a career and effectiveness in dealing with the problems which arise in the course of career development. In all, then there are five parts of the competence test.

Part 1- Self Appraisal (SA) (Knowing yourself).

Part 2- Occupational Information (OI) (Knowing about jobs).

Part 3- Goal Selection (GS) (Choosing job).

Part 4- Planning (PL) (Looking ahead)

Part 5- Problem Solving (PS) (What they should do).

Taken together, the Attitude scale and the competence test provide both an extensive and intensive inventory of the critical behaviours in mature career decision making and development. The attitude scale and competence test (Crites 1973, 1978) have scoring keys based on the student majority responses of grade XII of the American standardization sample. Grade XII has been taken as the most mature group in the adolescent stage. The rationale for this is that an individual's career maturity is assessed in relation to the most mature person in his age group or in his life stage.

The attitude scale and competence test have been adapted to Hindi with minor modifications in language and item contents to make it suitable for assessing career maturity of Indian school students.

Adaptation of the CMI attitude scale

The fifty items attitude scale was first translated in Hindi. Minor modifications in language were made to make the items easier so that the Indian students understand them. Some fresh items suited to our culture were added.

The Hindi version of the scale was given to fifteen judges who were experts working in the area of guidance. The judges were also provided with a description of the theoretical basis of the formation of the attitude scale items and the definitions of the five dimensions of the scale.

Keeping in view these descriptions, the judges were asked to rate each item on the basis of the following:

- Whether a 'true' response would be indicative of a mature response to an item or a 'false' one. Analysis of judges ratings revealed that there

was a high agreement between the judges ratings (70% and above) and the original (Crites) scoring key on thirty seven items and on two items there was 100% agreement among the judges to its response direction which was not in agreement with the original scoring key. On eleven items judges disagreed among themselves. These were modified and reframed in consultation with five experts in the area of guidance to make them more suitable for Indian students. Some fresh items were also framed which were also written on the five conative variables on which the items of the attitude scale are based. The fresh statements were taken from the actual counseling case records in consultation with t school counselors. These fresh items together with eleven original but modified items on which the judges disagreed were again given to the fifteen earlier judges and their ratings were taken on these items in a similar manner as described earlier. After the analysis of the ratings it was found that there was high agreement (70% and above) among the judges on four more items of the Crite's scale and also on seven fresh items.

- To have a scoring key based on class XII Indian students majority responses, the 50 items of Crite's scale and twelve fresh items were given to 105 randomly selected students of class XII of Government senior secondary schools of Delhi. The students were asked to mark 'true' or 'false' against each item. It was found that on forty one items of Crites scale the Indian class XII students responses are in the same response direction as American class XII students. It may be recalled that judges rating were not in agreement with original scoring key on two items. However the Indian class XII students agreed with the judges ratings on these two items, therefore, the scoring for these two, items, was changed from 'false' to true. The other fresh items were keyed in the response position endorsed by fifty one percent or more of the class XII Indian students which were in the same response direction as the judges ratings. Thus the adapted attitude scale has a scoring key which is based on the judges ratings as well as the

students majority responses i.e. the scoring key is meeting rational as well as empirical standards.

Discrimination index for each item was also worked out. Fianagan's (1939) procedure for estimating relationship of variables in a bivariate normal population was adopted for this purpose. The percentage of correct responses in each of upper (27%) and lower (27%) were calculated and a measure of relationship between them was obtained from the Flangan's table of values of the product moment coefficient of correlation in a normal bivariate population corresponding to given proportions of success. Those 50 items which had significant correlation indicating high item discrimination and judges agreement were selected, out of which 43 items are from original attitude scale and seven are fresh ones.

According to Crites (1961, 1974) for a vocational behavior to be termed developmental, it is necessary to demonstrate that it is systematically related to time. Thus the original scale has items which differentiate among age or grade levels in adolescence.

To see whether the modified attitude scale items meet the developmental criteria, the 50 item adapted scale was again given to 104 100 & 105 students of classes VIII, X & XII respectively, to see whether each items was sensitive enough to give developmental scores over three grades. The results showed all items indicating a developmental trend, F ratios were worked out for the fresh items which were significant.

Thus, the adapted attitude scale items were approved by the experts in the area of guidance regarding their suitability to Indian situation. The key for the adapted scale is based on class XII Indian students majority responses. Further the items included in the scale were found to be discriminating psychometrically and discriminating between grades.

Reliability

A test retest reliability with an interval of one month was calculated on Indian samples drawn from classes VII, X, and XII with n=40. The obtained correlations ranged from 0.78 to 0.82.

Validity

The inventory has a high level of content and constructs validity - as expressed by experts in guidance. The items of the attitude scale show developmental scores over classes VII, X, and XII which also established the validity of the scale in the Indian sample.

3. Health Related Physical Fitness (HRFT)

For study of health related fitness a standard questionnaire HRFT developed by Bera (2004) was used. This test consists of 22 questions. Each question has three options and players have to choose correct one according to their fitness level and tick-mark. This questionnaire has sufficient level of reliability (r=0.72) and it bears accepted level of content validity.

3.3 Procedure

For conducting survey on selected variables, all the 13,500 students (Male & Female) from the faculties of science, arts and commerce were selected randomly from the different colleges located in Amravati, Kolhapur and Pune districts of Maharashtra. These colleges were contacted either personally and/or by phone firstly. Then, with their permission and decision about a suitable time was given to the pollster for administration of the questionnaires so that the students don't get any difficulty or problem to fill them up. Majority of the subjects was contacted personally and the questionnaire was given to them by hand only in a class room situation. Any

queries by them concerning the questionnaire were clarified immediately at that time on the spot.

The subjects were then advised to take their time to fill up all the questionnaires though there was half an hour time limit was set to respond to each questionnaire. Few students did not fill up the questionnaires on the spot and therefore arrangement of another meeting with the research scholar was made so that they could return them after filling up.

Some subjects took the questionnaires but failed to return it due to certain reasons. Many questionnaires were also half filled up and they were discarded. In all, 13,500 questionnaires were distributed to the subjects, out of which 13,350 were dully filled up and returned. The filled questionnaires obtained were then analyzed.

3.4 Test Administration and Reliability of Data

Prior to administration of the tests, the investigator prepared three separate teams for three educational zones in Maharashtra. Each team consisted of five technical experts. Therefore, there were total 15 technical experts for test administration and data collection.

The researcher has taken three consecutive practical training sessions for these 15 technical experts who were clarified how to administer the questionnaires, the ways to deal with the head of the institution, other staff members and also with the sample students from where the data were collected.

He also explained the nature of questions available in the questionnaires with a view to the fact that it would not affect the validity and reliability of each component. The technical experts were made aware about the scoring principles and preserve the duly filled questionnaires.

Each of the technical experts were allowed to administer each questionnaire two times on a small sample of 10 students within a gap of 7 days and the test-reliability towards administering the questionnaires ranges from 0.93 to 0.96. Thus, the data collected here seems to be reliable.

Finally, the whole data collection was made under the overall supervision and guidance of the present investigator. The researcher confirmed that the atmosphere during administration of questionnaire was favourable.

3.5 Statistical Analysis

The descriptive data of this study were analyzed considering the following statistics:

- The data as obtained in terms of the responses from the questionnaire were analyzed primarily considering descriptive statistics viz., mean, standard deviation etc.

- For sex-wise as well as subject-wise profiles (arts, science and commerce) of Emotional intelligence, Career decision making and Health related fitness awareness were compared by employing Hotteling T^2 test and the results were further substantiated with 2 x 3 x 13 factorial ANOVA followed by Scheffe's post hoc test.

- The relationship between three major variables (viz., Emotional Intelligence, Career Decision Making, and Health Related Physical Fitness) was established by using Pearson's Product Moment correlation method and then Multiple Step up Regression was applied for prediction.

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