CHAPTER 3
METHOD
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This chapter discusses research method adopted for the present study. It is basically the plan and procedure that highlight the details of the work carried out by the researcher. This chapter also includes the variables in the study, research design followed by participant's details. It furthermore discusses the psychometric properties of all the measures, procedure of data collection and the statistical techniques adopted for analysis of the data.

RESEARCH DESIGN

The present study was intended to find out the internet addiction and its effects on visuo-motor coordination, psychomotor speed, attention and auditory memory among adolescents. Hence, the descriptive survey research was applied. Descriptive survey research is probably the most frequently used mode of study in the social sciences. Typically, the researcher selects a sample of respondents from a certain population and administers standardized questionnaires/scales to them.

PARTICIPANTS

Sample and sampling

The sample for the study was selected through random sampling technique and then stratified random sampling technique was used to make sure that everyone in the sampling frame has an equal chance of being selected. Thus, considering external variables, such as diversity in social, economic and cultural backgrounds, a list of the sample schools were randomly selected from different parts of Bengaluru and the lot was taken to decide the schools and Pre-university colleges to be visited to collect the
data. Students both girls and boys between the age group of 12 to 15 years and 16 to 18 years were selected for the present study.

Once the schools and colleges were selected, the researcher approached the heads of institutions and submitted a letter seeking permission to collect data. The principals of schools and colleges were informed about the nature of the research. With the consent of concerned authorities, the data for this study was collected.

Before administering the tests, the researcher developed a rapport with all students, who agreed to participate. Selected sample were administered with Dr. Kimberley Young’s internet addiction test, psychomotor ability test a subtest of David’s battery of differential abilities, Attention and concentration test a subtest of P.G.I memory scale and digit span forward and digit span backward a sub test of Wechsler adult intelligence scale along with demographic information. The sample selected consisted of early and late adolescents. They were studying in the schools and colleges in urban areas of Bangalore District in Karnataka.

- **Table 3.1 showing distribution of the sample by Age, Gender and Varied levels of Internet addiction**

<table>
<thead>
<tr>
<th></th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>12-15</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>15-18</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>
INCLUSION CRITERIA

1. Adolescents with mild, moderate, and severe internet addicts will be selected.

2. The age of participants must range from 12-18 years.

3. Participants should be of both genders.

4. Participants should give consent to participate in the study.

5. Adolescents belonging to schools and colleges in Bengaluru.

EXCLUSION CRITERIA

1. Adolescents who are not internet addicts.

2. Adolescents under psychological intervention.

3. Adolescents who have taken similar tests earlier.

4. Adolescents who are not enrolled in schools and colleges.

MEASURES

As per the requirement of the study, the following tools were employed:

- Information schedule
- Internet Addiction Test (IAT) – Dr. Kimberley Young (1998).
INFORMATION SCHEDULE

This schedule was developed to elicit the detailed information regarding age, gender, class, name of school/college, and level of internet addiction. It also includes parents’ qualification and their occupation, caste and religion.

INTERNET ADDICTION TEST (IAT) – DR. KIMBERLY YOUNG (1998)

Internet addiction test was developed by Dr. Kimberly Young (1998) of St. Bonaventure University and Director of the centre for Internet addiction recovery. It is a self report measure of five point rating with options namely- ‘rarely’, ‘occasionally’, ‘frequently’, ‘often’, and ‘always’ weighted on 1, 2,3,4,5 on the scale points. Items of the scale are in question form demanding information for each in any of the five options- ‘rarely’, ‘occasionally’, ‘frequently’, ‘often’, and ‘always’. The norms of the scale were established as (20-39)-Mild internet addicts, (40-69)-Moderate internet addicts, and (70-100)-Severe internet addicts. The highest the score on the scale is greater the degree of Internet addiction and vice-versa. The highest score of the Internet addiction Test can be obtained 100 and lowest can be 20. The test retest reliability of the scale was 0.82. The content and convergent validity and internal consistency of the IAT was 0.88 and bisection 0.72. Best cut off point for the questionnaire was 46. This scale is meant for adolescents and adults.


The Psychomotor Ability Test - A subtest of David’s battery of differential abilities-Revised was developed by Sanjay Vohra (2009). The standardization of DBDA-R is based on more than 2500 protocols tested at more than 12 locations throughout the country.
DBDA-R consists of eight subtests namely verbal ability (VA), numerical ability (NA), spatial ability (SA), clouser ability (CA), clerical ability (CL), Reasoning ability (RA), mechanical ability (MA), psycho-motor ability (PM).

In the present study psycho-motor ability (PM) a sub-test of DBDA-R was adopted and here PM ability refers to precise movements requiring eye-hand coordination under highly speeded conditions. PM ability can be considered one of fine-muscle dexterity, primarily manual. In the psychomotor ability test the subject requires to draw finely controlled pencil lines, as he/she can, in specially constructed figures.

Reliability Coefficients of DBDA-R Tests: The preliminary reliability estimates from this data are derived from the KR-20 formula as measure of internal consistency. Since all the tests of DBDA-R are speed tests, the KR-20 coefficients are not really appropriate. Therefore, the reliability coefficients from other methods (Split-half and Test-retest) have also been derived and given in the following table.

<table>
<thead>
<tr>
<th>Type of Coefficient</th>
<th>VA</th>
<th>NA</th>
<th>SA</th>
<th>CA</th>
<th>MA</th>
<th>CL</th>
<th>RA</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split-half</td>
<td>.72</td>
<td>.82</td>
<td>.95</td>
<td>.84</td>
<td>.69</td>
<td>.94</td>
<td>.76</td>
<td>.84</td>
</tr>
<tr>
<td>KR-20</td>
<td>.75</td>
<td>.78</td>
<td>.92</td>
<td>.74</td>
<td>.62</td>
<td>.89</td>
<td>.66</td>
<td>.76</td>
</tr>
<tr>
<td>Test-Retest</td>
<td>.79</td>
<td>.79</td>
<td>.85</td>
<td>.71</td>
<td>.70</td>
<td>.82</td>
<td>.61</td>
<td>.69</td>
</tr>
</tbody>
</table>
Concrete Validity: Concrete validity is taken into consideration for DBDA-R tests. Correlation between DBDA-R tests and intelligence tests and academic achievements has been studied during the pilot study and the resulting coefficients are shown in table 2.1 and 2.2 respectively.

**Table-3.3: Correlation between DBDA-R tests and Intelligence tests**

<table>
<thead>
<tr>
<th>Intelligence Tests</th>
<th>DBDA-R TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VA</td>
</tr>
<tr>
<td>WAIS (Verbal)</td>
<td>.57</td>
</tr>
<tr>
<td>16 PF (Factor-B)</td>
<td>.66</td>
</tr>
<tr>
<td>Jalota’s GMAT</td>
<td>.60</td>
</tr>
<tr>
<td>DBDA TESTS</td>
<td>Mean (Avg.)</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>CA</td>
<td>10.58</td>
</tr>
<tr>
<td>CL</td>
<td>34.30</td>
</tr>
<tr>
<td>MA</td>
<td>12.97</td>
</tr>
<tr>
<td>NA</td>
<td>11.30</td>
</tr>
<tr>
<td>PM</td>
<td>33.65</td>
</tr>
<tr>
<td>RA</td>
<td>5.77</td>
</tr>
<tr>
<td>SA</td>
<td>35.55</td>
</tr>
<tr>
<td>VA</td>
<td>12.68</td>
</tr>
<tr>
<td>N= 320</td>
<td></td>
</tr>
</tbody>
</table>

Scoring: Psychomotor ability score will be number of figures with correctly drawn lines, without making errors. Sten score of 1-3 will be below average eye-hand coordination under speeded conditions, sten score of 4-7 will be average ability to maintain a fine-muscle dexterity in manual tasks and sten score of 8-10 will be extremely high psycho-motor ability to perform accurately under speeded conditions.

The DBDA-R tests are primarily counselling instruments. For this purpose, scores on combination of several tests provide critical information. DBDA-R is used for early identification of gifted children. In some situations it is used to select
students for admissions in various courses, to place students in special curricular
groups or to identify students for positive reinforcement to continue their education
and training.

ATTENTION AND CONCENTRATION TEST - A SUBTEST OF P.G.I

MEMORY SCALE (1977)

The PGI memory scale was developed by Dwarka Prasad (Chandigarh) and
N.N.Wig (Chandigarh).

Attention and concentration one of the subtest of PGI memory scale was used in
the present study to assess internet addiction and its effects on attention among
adolescents. The scale was validated against four hypotheses:

1. The subjects suffering from neurological disorders would obtain poorer scores
   than the subjects suffering from functional psychiatric illness.
2. The older subjects should obtain lower scores than younger normal adults
3. The scores on memory scale should have positive relationship with education
4. It should have high correlation with intelligence test scores.

The correlations of PGI memory scale with age and education were computed on
340 normal subjects (attendants of the psychiatric patients) in the age range of 20-70
years. The correlation of performance IQ and verbal IQ was tested on four subtests of
verbal section of WAIS, i.e. information, comprehension, aithmetic and digit span
tests. F-values for Remote memory is 1.93, Recent memory is 1.75, Mental balances
is 2.26, Attention concentration is 1.41, Delayed recall is 2.42, Immediate recall
(sequential reproduction of sentences) is 1.57, Retention for similar pairs is 1.93,
Relations for dissimilar pairs is 3.94, Visual retention is 3.49 and Recognition is
2.42. The F-values are significant beyond .01 and all T-values are significant beyond
0.05 except for recall (sequential reproduction of sentences). The results supported the hypotheses and hence the scale can be considered a valid measure of memory.

Reliability of the scale: so far as reliability of the scale is concerned, it was re-administered on 40 subjects after an interval of one week. The test-retest reliability ranged between .70 and .84 for psychotic groups, .48 and .84 ‘neurotic normal’ group, mean differences were not significant for many of the subject (Preshad, 1977). On the whole, however, an increase of 4 points was observed on repeat testing. It thus indicates that the PGI memory scale is reliable and scores are fairly consistent over the period of time (Preshad, 1977, Preshad and Wig, 1978).

Scoring: Summation of digits forward and backward is the score for the subtest Attention and concentration.

**DIGIT SPAN FORWARD AND DIGIT SPAN BACKWARD - A SUB TEST OF WECHSLER ADULT INTELLIGENCE TEST (2008)**

The Wechsler adult intelligence test was devised in 1939 by David Wechsler at the Department of Psychiatry in Bellevue hospital (New York). The Wechsler adult intelligence test revised was released in 1981. WAIS-1V is the latest version scale which is used world widely. Digit span is a measure of immediate auditory memory. The test requires the ability to attend and concentrate as well as to remember. In digit backward, there is the additional skill of reverse sequencing, which appears to be largely spatial rather than verbal in nature. The test retest reliabilities of the scale ranged from 0.70 (7 subscales) to 0.90 (2 subscales). Inter-scorer coefficients were very high, all being above 0.90.
Procedure:

The study was conducted in two phases, i.e., Pilot study and the main study.

Phase one - Pilot study

The pilot study was conducted on a sample of 50 adolescents aged between 12-18 years from different colleges of Bengaluru city, to check the feasibility of the scales. The results of the pilot study helped to use appropriate scales to measure the variables of the study.

Phase two – Main study

650 School and College students aged between 12 to 18 years willing to participate in the research were administered Dr. Kimberly Young’s internet addiction test, Psycho-motor ability test, Attention and concentration test and Digit span forward and Digit span backward test. Inclusion criteria and exclusion criteria was also considered. In the beginning rapport was established with the participants. They were given socio demographic sheets to be filled in by them. All participants received the same descriptions of the study and were told that all responses provided would be both confidential and anonymous.

This study was conducted in four sessions. Before administering the tests, good rapport was established with the participants to encourage them to give honest response. The participants were given a briefing about the purpose of the study and the importance of their participation and also participants were assured that their information will be kept confidential. After rapport is established, appropriate instructions were given to them and were allowed to fill in their personal information and answering the questionnaire. Sufficient time was given to them to respond to all
items, maximum care was taken to see that no item was left unanswered. Data collection was done in four sessions and each session lasted for about 15-40 minutes.

SESSION 1:

In first session screening was done to assess varied level of internet addiction among the participants. Young’s internet addiction test was administered to participants after establishing rapport with them. Participants read each item carefully and chose one of five possible responses (‘rarely’, ‘occasionally’, ‘Frequently’, ‘Often’, ‘always’) which best describes them.

Among 650 participants 160 participants were found with mild internet addiction, 210 participants were found with moderate internet addiction and lastly 280 participants were found with severe internet addiction. Random sampling technique was used and 30 male and 30 female mild internet addicts between the age group of 12 to 15 years were selected, 30 male and 30 female moderate internet addicts between the age group of 12 to 15 years were selected, 30 male and 30 female severe internet addicts between the age group of 12 to 15 years were selected for the present study. In the similar way 30 male and 30 female mild internet addicts between the age group of 16 to 18 years were selected, 30 male and 30 female moderate internet addicts between the age group of 16 to 18 years were selected, 30 male and 30 female severe internet addicts between the age group of 16 to 18 years were selected for the present study. The total number of sample selected for the present study was 360.
SESSION: 2

In the second session, Psycho-motor ability test a sub test of DBDA-R was administered to participants after establishing rapport with them. Participants were requested to draw a line freehand all the way around the outer and inner squares, and are supposed to draw a circle around the dot. Participants are not suppose to touch the line either of the square or the dot. Participants are not suppose to use ruler to draw the line, all pencil marks must be drawn freehand. They have to finish each figure completely before going on to the next one. Erasers are not allowed in this test. Five minutes is allotted to complete the test.

SESSION: 3

In the Third session, Attention and concentration test a sub test of PGI memory scale was administered after establishing rapport with them. This test consists of two sections: Digit forward and Digit backward. For digit forward, the participants were told that the examiner will say some numbers, which the subject should repeat afterward exactly as they were given. The first item involves three digits and the most difficult item involves nine digits. If the participants correctly repeat a series, the examiner goes on to the next longer series. If an item is missed, a second item of the same length is given. If this is repeated correctly, the examiner moves on to the next longer series. If the second item of a given length is missed, the test is discontinued.

Digits backward is given in much the same way. In this subtest, the participants must repeat the given numbers in the reverse order rather than exactly as stated. Item difficulty varies from two to eight numbers.
SESSION: 4

In the Fourth session, Digit forward and Digit backward a subtest of Wechsler adult’s intelligence scale was administered after establishing rapport with them. This test consists of two sections: Digit forward and Digit backward. For digit forward, the participants were told that the examiner will say some numbers, which the subject should repeat afterward exactly as they were given. The first item involves three digits and the most difficult item involves nine digits. If the participants correctly repeat a series, the examiner goes on to the next longer series. If an item is missed, a second item of the same length is given. If this is repeated correctly, the examiner moves on to the next longer series. If the second item of a given length is missed, the test is discontinued.

Digits backward is given in much the same way. In this subtest, the participants must repeat the given numbers in the reverse order rather than exactly as stated. Item difficulty varies from two to eight numbers.

STATISTICAL METHODS APPLIED

1. DESCRIPTIVE STATISTICS: Descriptive statistical techniques are Measures of central tendency such as Mean, Median and Mode; Measures of variability provide a means of describing the spread of scores in a distribution. The frequently used measures of variability are the range, standard deviation and quartile deviation.
In the present study descriptive statistics like mean and S.D were employed to understand the difference between early adolescent and late adolescent in their level of internet addiction as well to know the difference in other dependent variables such as visuo-motor coordination, psycho motor speed, attention and auditory memory.

2. ONE WAY ANOVA: One way ANOVA is employed by the researcher when finding the difference between more than 2 Independent variables. For the present study with the help of one way ANOVA the significant difference between visuo-motor coordination, psycho motor speed, attention and auditory memory among the varied Internet addict groups such as mild, moderate and severe was verified. The obtained F results are discussed in discussion chapter.

3. TWO WAY ANOVA: To verify the interactive effects between the variables Two way ANOVA is used. For the present study with the help of two way ANOVA the interaction effects between levels of Internet addiction and developmental span on visuo-motor coordination, psychomotor speed, attention and auditory memory span and also to verify the interaction effect between levels of Internet addiction and gender on visuo-motor coordination, psychomotor speed, attention and auditory memory span. The obtained F results are discussed in discussion chapter.
<table>
<thead>
<tr>
<th>HYPOTHESIS</th>
<th>HYPOTHESIS STATEMENT</th>
<th>STATISTICS USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Adolescents with mild, moderate &amp; severe internet addiction differ significantly in their visuo-motor coordination and psychomotor speed.</td>
<td>One Way ANOVA</td>
</tr>
<tr>
<td>H2</td>
<td>Adolescents with mild, moderate &amp; severe internet addiction differ significantly in their attention.</td>
<td>One Way ANOVA</td>
</tr>
<tr>
<td>H3</td>
<td>Adolescents with mild, moderate &amp; severe internet addiction differ significantly in their auditory Memory.</td>
<td>One Way ANOVA</td>
</tr>
<tr>
<td>H4</td>
<td>There will be a significant interaction effects between levels of internet addiction and developmental span on visuo-motor coordination, psychomotor speed, attention and auditory memory.</td>
<td>Two way ANOVA</td>
</tr>
<tr>
<td>H5</td>
<td>There will be a significant interaction effects between levels of internet addiction and gender on visuo-motor coordination, psychomotor speed, attention and auditory memory.</td>
<td>Two way ANOVA</td>
</tr>
</tbody>
</table>
SUM UP

For any research design the method part act as a blue print. This part will guide the researcher to plan his study and to proceed in a more systematic order, further it also helps the researcher how to the inferences and the conclusions in the upcoming chapter.

The methodology that has been adopted includes, the sample size and procedure that was used to administer the test, scoring pattern for each test, inclusion and exclusion criteria, and the statistical measures that have been used to assess the data were also included.