CHAPTER IV
RESEARCH DESIGN

4.1 INTRODUCTION

Research is a scientific and systematic enquiry that uses disciplined methods to answer questions or solve problems. The ultimate goal of research is to develop, refine and expand a body of knowledge. A research design is the determination and statement of the general research approach or strategy adopted for the particular project. It is the heart of planning (Basavanthappa, 2007).

According to Kerlinger, research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. A research design is the specification of methods and procedures for acquiring the information needed. It is the over-all operational pattern or framework of the project that stipulates what information is to be collected from which source by what procedures. A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2011).

Need for Research Design

Research design is needed because it facilitates the smooth sailing of the various research operations thereby making research as efficient as possible yielding maximum information with minimal expenditure of effort, time and money. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping the view the objective of the research and the availability of staff, time and money. The two important concepts related to research design are hypothesis and variables (Kothari, 2011).
Hypothesis

A hypothesis is a formally stated expectation about how behaviour operates. A causal hypothesis postulates a particular causal influence on behaviour. A descriptive hypothesis postulates particular characteristics or aspects of the behaviour. A research hypothesis is a predictive statement that related an independent variable to a dependent variable. Scientific hypotheses must be testable, falsifiable, precise, rational and parsimonious. A hypothesis is a statement of the researcher’s expectations about relationships between study variables (Kothari, 2011).

Variables

A variable as the name implies, is something that varies. A variable is any quality of person, group, or situation that varies or takes on different values-typically numeric values. It might be an attribute, character, behaviour, quality or quantity. An independent variable is a variable that is systematically changed or manipulated by the experimenter. It is the variable that causes a change in behaviour. The dependent variable reflects some aspect of participants or their response under each condition of the independent variable. The dependent variable is also called the dependent measure. Variables are the central building blocks of quantitative studies. (Tripathi, 2010).

4.2 INTRODUCTION TO THE PRESENT STUDY

The present study is discussed under the following headings. They are as follows:-

1. Objectives
2. Research questions
3. Null hypothesis
4. Research Design
5. Population/Universe
6. Sample
7. Sampling Technique
8. Variables
7. Tool/Instrument
8. Pilot study
9. Data collection procedure
10. Plan for analysis of data

4.3 OBJECTIVES OF THE STUDY

1. To assess the prevalence of violent video game playing among children
2. To assess the psychological effect of playing violent video games among children
3. To assess the physiological effect of playing violent videogames among children
4. To correlate the violent videogame playing and aggression.
5. To correlate the selected physiological variables of children and aggression.
6. To correlate the violent videogame playing and stress.
7. To correlate the selected physiological variables of children and stress.
8. To correlate the violent videogame playing and the selected physiological variables.
9. To assess the regression effect of significantly correlated variables of violent video game playing on aggression.
10. To assess the regression effect of significantly correlated variables of violent video game playing on stress.
11. To associate the duration of playing violent video game playing with the most favourite video game.
12. To associate the preferred place of playing violent videogame with the most favourite game.
13. To associate the hours of playing violent video game with the most favourite game.
14. To associate the preferred time of playing violent video game with the most favourite game

15. To associate the psychological effect (level of aggression) of playing violent video games with the demographic variables.

16. To associate the psychological effect (level of aggression) of playing violent video games with the violent video game playing.

17. To associate the psychological effect (level of stress) of playing violent video games with the demographic variables.

18. To associate the psychological effect (level of stress) of playing violent video games with the violent video game playing.

4.4 RESEARCH QUESTIONS

Research questions are specific queries researchers want to answer in addressing the research problem. The research questions in this study are as follows:-

- What is the frequency of playing violent video games?
- What are the psychological effects of playing violent video games?
- What are the physiological effects of playing violent video games?
- Is there any relationship between violent video game playing (duration, frequency, type, time and place of playing) and the aggression?
- Is there any relationship between violent video game playing (duration, frequency, type, time and place of playing) and the stress?
- What is the effect of playing violent video game (duration, frequency, type, time and place of playing) on the physiological variables (pulse, respiration, blood pressure, weight and height)?
- What is the effect of physiological variables (pulse, respiration, blood pressure, weight and height) on the psychological variables (aggression and stress)?
• Is there any association between the psychological effects of playing violent video games with the demographic variables?

• Is there any association between the psychological effects (aggression and stress) with the violent video games playing?

4.5 NULL HYPOTHESIS

A hypothesis is a statement of the researcher’s expectations about relationships between study variables. Hypotheses, in other words are predictions of expected outcomes. It is a prediction about the relationship between two or more variables. The null hypotheses formulated in this study were as follows:-

1. Null hypotheses related to violent video game playing and aggression (1a – 1h)

• 1a. There is no significant relationship between the duration of playing violent video game and aggression in children.

• 1b. There is no significant relationship between the place of playing violent video game and aggression in children.

• 1c. There is no significant relationship between the frequency of playing violent video game and aggression in children.

• 1d. There is no significant relationship between the time of playing violent video game and aggression in children.

• 1e. There is no significant relationship between the hours of playing violent video game and aggression in children.

• 1f. There is no significant relationship between the favourite violent video game and aggression in children.

• 1g. There is no significant relationship between the reason for playing violent video game and aggression in children.
• 1h. There is no significant relationship between the feeling upon losing game and aggression in children.

2. Null hypotheses related to physiological variables and aggression (2a – 2d)
   • 2a. There is no significant relationship between the pulse and aggression in children.
   • 2b. There is no significant relationship between the respiration and aggression in children.
   • 2c. There is no significant relationship between the blood pressure and aggression in children.
   • 2d. There is no significant relationship between the weight and aggression in children.

3. Null hypotheses related to violent video game playing and stress (3a – 3e)
   • 3a. There is no significant relationship between the duration of playing violent videogame and stress in children.
   • 3b. There is no significant relationship between the frequency of playing violent videogame and stress in children.
   • 3c. There is no significant relationship between the time of playing violent videogame and stress in children.
   • 3d. There is no significant relationship between the hours of playing violent videogame and stress in children.
   • 3e. There is no significant relationship between the favourite game violent videogame and stress in children.

4. Null hypotheses related to physiological variables and stress (4a & 4b)
   • 4a. There is no significant relationship between the blood pressure and stress in children.
   • 4b. There is no significant relationship between the weight and stress in children.
5. Null Hypothesis related to violent video game playing and physiological variables (5a)
   - 5a. There is no significant relationship between the violent video game playing and the physiological variables such as pulse, blood pressure and weight.

6. Null hypotheses related to violent video game playing and favourite video game (6a – 6d)
   - 6a. There is no association between the duration of playing violent video game and the favourite game.
   - 6b. There is no association between the preferred place of playing violent video games and the favourite game.
   - 6c. There is no association between the hours of playing violent video game and the favourite game.
   - 6d. There is no association between the preferred time of playing violent video games and the favourite game.

7. Null hypotheses related to level of aggression and selected demographic variables (7a)
   - 7a. There is no association between the level of aggression and the selected demographic variables.

8. Null hypotheses related to level of aggression and violent video game playing (8a)
   - 8a. There is no association between the level of aggression and the violent video game playing.

9. Null hypotheses related to level of stress and selected demographic variables (9a)
   - 9a. There is no association between the level of stress and the selected demographic variables.

10. Null hypotheses related to level of stress and violent video game playing (10a)
    - 10a. There is no association between the level of stress and the violent video game playing
4.6 RESEARCH DESIGN ADOPTED FOR THE STUDY

The research design is the overall plan for obtaining answers to the questions being studied. The research approach used in this study was non experimental in nature. A descriptive co-relational research design was adopted in this study.

The purpose of a descriptive co-relational design is to examine the relationships that exist in a situation. Using this design facilitates the identification of many interrelationships in a situation in a short time. A descriptive co-relational study may examine variables in a situation that has already occurred or in a currently occurring situation. No attempt is made to control or manipulate the situation (Nancy Burns & Grove, 2001).

The major aim of the study was to find out the psycho-physiological effect of playing violent video game and to examine the relationship between the variables. It is planned to correlate the variables of violent video game playing such as duration, place, frequency, time, hours and favourite video game etc with the psychological variables such as aggression, stress and also with the physiological variables such as pulse, respiration, blood pressure and weight.

4.7 POPULATION/UNIVERSE

A population is the entire aggregation of cases in which a researcher is interested. The accessible or source population is the aggregate of cases that conform to designated criteria and that are accessible as subjects for a study. The target population is the aggregate of cases about which the researcher would like to generalize (Basavanthappa, 2007).

Population is defined as totality of individual observations about which inferences are to be made, existing anywhere in the world, or within a definitely specified sampling area limited by space and time. Totality of items or units in any field of enquiry is known as Universe. Finite population is one in which the total number of individual observations is known.
Infinite population is one in which the total number of individual observations is not known or infinitely large (Kothari, 2011).

**Universe in this research**

The population for this research included all boys and girls in the age group of 13 to 18 years who are residing in south Chennai. They must have the habit of playing violent videogames for not less than six months.

**4.8 SAMPLE**

A sample is defined as a collection of individual observations from the population about which inferences are to be made, and is obtained by a specific method. Thus a sample is a subgroup of the population or it is a subset of the target population.

**Sample**

From the universe, 350 samples were selected. The samples were children, both boys and girls in the age group of 13 to 18 years and who also had played violent videogames such as racing games, fighting games, shooting games and satanic games for not less than six months. The samples were selected from the video game shops after obtaining permission from the shop owners.

**4.9 SAMPLING TECHNIQUE**

The process of drawing a sample from a population is called sampling. There are two basic types of sampling techniques. They are

- Probability sampling technique
- Non probability sampling technique

Probability sampling involves random selection of elements from the population. Random selection occurs when each element of the population has an equal and independent chance of being included in the sample. In non probability samples, elements are selected by non
random method. Purposive sampling or judgmental sampling is a type of non-probability sampling technique in which subjects are selected because they are identified as knowledgeable regarding the subject under investigation and is based on the belief that researcher’s knowledge about the population can be used to hand pick sample members. Researchers might decide purposely to select subjects who are judged to be typical of the population or particularly knowledgeable about the issues under the study. This method means deliberate selection of sample units that conform to some predetermined criteria (Basavanthappa, 2007).

In this study, samples were selected using purposive sampling technique. The samples both boys and girls in the age group of 13 to 18 years and who also had played violent videogames such as racing games, fighting games, shooting games and satanic games for not less than six months were selected.

4.10 VARIABLES

A variable is defined as a property with respect to which individuals in a population and a sample from that population differ in some ascertainable way. In a simple meaning, a variable is anything which varies from person to person. There are two major types of variables. They are independent and dependent variable. If one variable depends upon or is a consequence of the other variable, it is termed as a dependent variable, and the variable that is antecedent to the dependent variable is termed as an independent variable (Kothari, 2011).

Variables in this research

The major variables in this research were as follows:

Independent variables

(i) Demographic Variables

- Age
- Sex
• Parental Education
• Parental Occupation
• Income
• Religion

(ii) Variables of Violent video game playing
• Duration of Playing
• Place of Playing
• Frequency of Playing
• Time of Playing
• Hours of Playing
• Favourite game
• Introduction of video games
• Reason for Playing
• Feeling upon losing games
• Playing games helping studies
• Parental Awareness
• Parental Encouragement
• Parental Reaction

Dependent Variable

(i) Physiological variables
• Pulse
• Respiration
• Blood pressure
• Height
• Weight
(ii) Psychological Variables

- Aggression
- Stress

4.11 TOOL/INSTREMENT

A tool or instrument is a testing device for measuring a given phenomenon, such as a paper and pencil test, a questionnaire, an interview, a research tool, or a set of guidelines for observation. Data collection tool is an instrument used to collect information on some specific phenomena. Structured data collection involves having a fixed, rather than flexible, approach to gathering information. Both the people collecting the data and the people providing the information are constrained during the collection of structured data. Constraints are imposed so that there is consistency in what is asked and how answers are reported, in an effort to enhance objectivity and reduce biases. Researchers collecting structured self report data use a formal, written instrument. The instrument is an interview schedule when the questions are asked orally in either face to face or telephone interviews. It is called a questionnaire or a Self Administered Questionnaire (SAQ) when respondents complete the instruments themselves, usually on a paper and pencil instrument. Sometimes researchers embed an SAQ into an interview schedule, with interviewers asking some questions orally but respondents answering others in writing (Kothari, 2011).

Structured instrument consist of a set of questions (sometimes called items), in which the wording of both the questions and, in most cases, response alternatives is predetermined. When structured interviews or questionnaires are used, subjects are asked to respond to the same questions, in the same order, and with the same set of response options. The data collection tool used in this research is a structured one.
DESCRIPTION OF THE TOOL

The tool consisted of

Part 1 Demographic data

Part 2 Questions to assess the violent video game playing in Children

Part 3 Physiological data

Part 4 Aggression Inventory

Part 5 Stress Inventory

Part 1 Demographic data

It consisted of questions related to the demographic data of the samples such as Age, Sex, and Parent’s education, Occupation, Income and Religion.

Part 2 Questions to assess the violent video game playing in Children

The questions to assess violent videogame playing of children were related to the duration of playing violent videogames, frequency of playing violent videogames, most favourite game, and time of playing violent videogames, place of paying violent videogames, reason for playing, parental awareness, encouragement and their reaction towards violent videogame playing.

Part 3 Physiological data

It included

- Pulse
- Respiration
- Blood pressure
- Height
- Weight
Part 4 Aggression Inventory

Aggression was measured using an aggression inventory. It is modified from Buss and Durkey Hostility Inventory. It consisted of 36 items or statements for which the sample has to either say ‘Yes’ or ‘No”. The samples have to select ‘Yes’ if they accept the statement and ‘No’ if they do not accept the statement. Each item was given a score of one with the maximum score of 36. The total score was counted and percentage was calculated.

Part 5 Stress Inventory

Stress was assessed using stress inventory which consisted of 15 statements. It is modified from Gordon stress inventory. It is a rating scale. Each statement is rated as follows. They are

<table>
<thead>
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<th>Score</th>
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<tbody>
<tr>
<td>Never</td>
<td>0</td>
</tr>
<tr>
<td>Almost Never</td>
<td>1</td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
</tr>
<tr>
<td>Fairly Often</td>
<td>3</td>
</tr>
<tr>
<td>Very often</td>
<td>4</td>
</tr>
</tbody>
</table>

The items are related to sleep, energy level, appetite, sickness, headache, irritability, anxious, angry, depression or cry, impatience, forgetfulness, concentration on daily affairs, motivation, unknown fears and wanting to be alone. The maximum score is 60. The total score was counted and the percentage was calculated.

4.12 PILOT STUDY

A pilot study is a small scale version or trial run designed to test the methods to be used in a larger, more rigorous study, which is sometimes referred to as the parent study. For the purpose of establishing reliability of the prepared tools, a pilot study was conducted on a sample of 30 children in the age group of 13 to 18 years in Tiruvanmiyur in Chennai. The tool was administered in Tamil and English. After collecting the data the responses were
scored. After two weeks the aggression and stress inventory was administered to the same set of respondents. In aggression inventory, few words in Tamil which the children could not understand have been changed after pilot study.

**VALIDITY**

Validity is generally defined as its capacity to measure what it purports to measure. Content validity is demonstrated by assessing if the instrument is a representative sample of the content it was originally designed to measure. A thorough review of literature and the item review by the experts enhance the validity of the tool.

After a thorough review of literature, the tool was prepared. The aggression and stress inventory was prepared from the Buss and Durkey hostility inventory and Gordon stress inventory. Then the tool was validated by three experts namely Dr. Beulah Shekhar, Associate Professor and Research Guide, Manonmaniam Sundaranar University, Tirunelveli; Dr. P. Sekar, Professor and Consultant Paediatrician, Institute of Child Health and Hospital for Children, Egmore and Dr. C. N. RamGopal, Visiting Faculty and Clinical Psychologist, Chennai. Their feedback resulted in refinement of the instrument and rephrase of some questions. Their suggestions were also incorporated. Hence the tool was considered to be valid to assess the psycho – physiological variables.

**Reliability**

The reliability of an instrument is a major criterion for assessing its quality and adequacy. An instrument’s reliability is the consistency with which it measures the target attribute. The test – retest method was used for finding reliability of the tools. Then Pearson products moment correlation for these two set of scores were found.

The reliability scores were as follows:

- Aggression scale 0.74
- Stress scale 0.78
Reliability statistics as per Cronbach’s Alpha for stress inventory was 0.84 and aggression inventory was 0.7. The Cronbach’s alpha value for the both the inventories were in the acceptable level and it showed that the items were internally consistent. Reliability statistics as per split half method for stress inventory was 0.72. Nunnaly (1994) has indicated 0.7 to be an acceptable reliability coefficient (Cronbach’s Alpha) but lower thresholds are sometimes used in the literature.

4.13 DATA COLLECTION PROCEDURE

Samples were selected using purposive sampling technique. After obtaining permission from the shop owners, the samples were identified. These children were explained about the study and permission was obtained. Then their parents were informed about the participation of their children in this study and permission was obtained from them. After they played the video game for minimum half an hour, the questionnaire was administered to the children. The questionnaire was prepared in Tamil and English and these were used according to their convenience and their language preference. Older children were given the questionnaire to fill the data and for the younger children, interview was conducted using the same tool. Their physiological data was measured by the researcher. Their doubts were clarified by the researcher. It took around 40 to 50 minutes for each sample to complete the data collection.

Measurement of physiological parameters

Physiologic measurements can be classified in one of two major categories. In vivo measurements are those performed directly in or on living organisms. Examples include blood pressure and pulse. An in vitro measurement, by contrast, is performed outside the organism’s body, as in the case of measuring serum potassium concentration in the blood. In vivo measures often involve the use of highly complex instrumentation systems. An instrumentation system is the apparatus and equipment used to measure one or more
attributes of a subject and the presentation of that measurement data in a manner that humans can interpret. (Polit, 2008).

The child was made to sit comfortably before checking pulse, respiration and blood pressure.

- Pulse: Checked with electronic monitor
- Respiration: Counted manually
- Blood pressure: Checked with electronic monitor
- Height: Measured with inch tape
- Weight: Checked with weighing scale

**4.14 PLAN FOR DATA ANALYSIS**

Descriptive statistics describe the main features of a collected data quantitatively. Descriptive statistics are distinguished from inferential statistics (or inductive statistics), in that descriptive statistics aim to summarize a data set quantitatively without employing a probabilistic formulation, rather than use the data to make inferences about the population that the data are thought to represent. Even when a data analysis draws its main conclusions using inferential statistics, descriptive statistics are also generally presented. Descriptive statistics provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of quantitative analysis of data.

Inferential statistics tries to make inferences about a population from the sample data. Inferential statistics are used to make judgments of the probability that an observed difference between groups is a dependable one, or that it might have happened by chance in this study. Thus, it is used to make inferences from the sample’s data to more general conditions. Some of the inferential statistics are correlation coefficient, chi square test, ANOVA, MANOVA, ‘t’ test etc (Kothari, 2011).
Descriptive statistics used in this study are frequency, percentage, mean and Standard Deviation. Inferential statistics used in this research are correlation coefficient, Regression analysis and chi square test.

Table 4.1: Statistical analyses and its purpose

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Test</th>
<th>Purpose</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td><strong>Descriptive Statistics</strong></td>
<td>To explain all variables.</td>
</tr>
<tr>
<td></td>
<td>Frequency and Percentage</td>
<td>To explain the physiological variables such as pulse, respiration, blood pressure, height and weight.</td>
</tr>
<tr>
<td></td>
<td>Mean and Standard Deviation</td>
<td>To explain the correlation or relationship between the variables.</td>
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<tr>
<td></td>
<td>Co-relation coefficient</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Inferential Statistics</strong></td>
<td>To explain the effect of independent variable on the dependent variable</td>
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<tr>
<td></td>
<td>Regression analysis</td>
<td>To explain the association between the variables.</td>
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<tr>
<td></td>
<td>Chi Square test</td>
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