3.1 INTRODUCTION:

Research methodology is a systematic manner to find the solution of a problem under study. In this, the steps are included to test hypotheses of research problem and also to facilitate the ability to choose the methods or techniques which are relevant. In planning a research project it is necessary for researcher to identify whether they will employ qualitative, quantitative or mixed research methods. These methods are based on bringing together a world view or assumptions about research. Quantitative methods are used in this study by examining the relationship among variables. In this chapter, objectives of the study, hypothesis testing, research methods, data collection and analysis of collected data explained in detail. Finally at the end of this chapter, data analysis techniques and limitation of study are explained.

The aim of the study is to find out the factors affecting attitude of investors towards mutual fund and for this a survey is conducted by designing a questionnaire to find a particular trend that may affect a particular group. This included an exhaustive study of demographic
characteristics and details of investors. For these reasons, the researcher chose a descriptive research methodology and designed a questionnaire to assess the perceptions of retail investors regarding their risk preference, investment option and trading frequency throughout the Rajasthan.

3.2 POPULATION UNDER STUDY:

Rajasthan is one of the beautiful states of India. Jaipur, the Pink City, is the capital of Rajasthan. There are various palaces in Rajasthan, like, City Palace, Mehrangarh Fort, Junagarh Fort which are attraction point for tourists. Rajasthan is famous for temples, havelis and majestic forts as well. Although, the state is a desert but there is a tremendous growth in the field of agriculture and infrastructure.

According census 2013, the population of Rajasthan is 7,10,41,283. Out of total population, 90% Hindus and 8% Muslims with largest minority and rest 2% are from other religion are living in Rajasthan. The Rajput pertain a small proportion in Rajasthan but are the most influential society of Rajasthan. Some tribes like Damariyas, Sahariyas, Lohar, Garasias also important part of Rajasthan.

At present there are 926 females over 1000 males in Rajasthan which is very less comparatively other states in India. There are very few districts in Rajasthan sax ratio is more than 900. In last two decades sex
ratio in Rajasthan has declined so there is a need to take proper action for that.

At present the literacy rate of India is 74% while the literacy rate of Rajasthan is 67% which is very low. Government has taken several steps to improve the literacy rate in India like, free education, scholarship, mid day meal, etc. for students.

Rajasthan has a large number of investors belonging to the middle class households. Rajasthan has a very good financial infra-structure and access to large volume of NRI (Non Residence of India) funds. The saving rate in Rajasthan is very high compare to other states. Though investors and investor behavior differ, the ultimate goal of an investor is attaining high return with low risk. There are different investment avenues, but the problem is to select the most remunerative and appropriate of them. Some are simple, some complex, and some guarantee fixed returns while some involves high risk. The investments depend on choice, need and experience of investor. It is clear that the investments which are appropriate for one type of investor and are not suitable for other investors.

All the mutual fund investors in the Rajasthan are considered as population for current research study.
3.3 SAMPLE SELECTION OF INVESTORS:

The population for the study is limited to Rajasthan state since it was not possible to approach entire universe for survey, so two-phase process was used to select the investors. In the first phase approximate 814 investors of Rajasthan were approached via email and social media and floated the message on several social networks like LinkedIn, facebook, etc. Then following three questions were asked:

1. Do you reside in Rajasthan?
2. Do you invest in mutual funds?

If answers of above both questions are yes, then

3. Would you like to participate in the survey?

The researcher received a positive reply from 342 investors. The researcher then contacted around 250 investors personally with the same setup of questions and got a positive reply from 126 investors. Then the researcher also contacted some Non-Banking Financial Companies (NBFC) situated in Kota, Jaipur, Tonk, and Udaipur and got positive response from 102 investors who agreed to be the part of the survey. In the second phase the questionnaire was mailed to all these 570 investors and response received from 467 investors, out of them 35 questionnaires were
Table 3.1: City wise Sample Distribution of Retail Investors

<table>
<thead>
<tr>
<th>City</th>
<th>Number of Investors in the Sample</th>
<th>Percentage in the Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonk</td>
<td>120</td>
<td>27.64</td>
</tr>
<tr>
<td>Jaipur</td>
<td>100</td>
<td>23.04</td>
</tr>
<tr>
<td>Kota</td>
<td>69</td>
<td>15.90</td>
</tr>
<tr>
<td>Udaipur</td>
<td>49</td>
<td>11.29</td>
</tr>
<tr>
<td>Jodhpur</td>
<td>37</td>
<td>8.53</td>
</tr>
<tr>
<td>Bikaner</td>
<td>34</td>
<td>7.83</td>
</tr>
<tr>
<td>Bhilwara</td>
<td>25</td>
<td>5.76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>434</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

3.4 HYPOTHESIS TESTING:

Hypothesis testing is best strategy for taking decision on the basis of available information. Thus hypothesis testing enables us to make probability statements about population parameters. The hypothesis may not be proved absolutely, but in practice it is accepted if it has withstood a critical testing.

For judging the relationship between two attributes two types of
hypotheses namely null hypothesis that is symbolized as \( H_0 \) and alternative hypothesis that is symbolized as \( H_1 \) are to be established as follows:

3.4.1 *Share of mutual funds in total investment:*

* **Hypothesis One**

\((H_0)_1\): Investment proportion in mutual funds by investors is independent of their age.

\((H_1)_1\): Investment proportion in mutual funds by investors is dependent on their age.

* **Hypothesis Two**

\((H_0)_2\): Investment proportion in mutual funds by investors is independent of gender.

\((H_1)_2\): Investment proportion in mutual funds by investors is dependent on gender.

* **Hypothesis Three**

\((H_0)_3\): Investment proportion in mutual funds by investors is independent of marital status.

\((H_1)_3\): Investment proportion in mutual funds by investors is dependent on marital status.
* Hypothesis Four

\((H_0)_4\): Investment proportion in mutual funds by investors is independent of annual income.

\((H_1)_4\): Investment proportion in mutual funds by investors is dependent on annual income.

* Hypothesis Five

\((H_0)_5\): Investment proportion in mutual funds by investors is independent of occupation.

\((H_1)_5\): Investment proportion in mutual funds by investors is dependent on occupation.

* Hypothesis Six

\((H_0)_6\): Investment proportion in mutual funds by investors is independent of qualification.

\((H_1)_6\): Investment proportion in mutual funds by investors is dependent on qualification.

3.4.2 Duration of respondent’s investment in mutual funds:

* Hypothesis Seven
(\(H_0\)_7): Investment experience in mutual funds of investors is independent of age.

(\(H_1\)_7): Investment experience in mutual funds of investors is dependent on age.

*Hypothesis Eight

(\(H_0\)_8): Investment experience in mutual funds of investors is independent of gender.

(\(H_1\)_8): Investment experience in mutual funds of investors is dependent on gender.

*Hypothesis Nine

(\(H_0\)_9): Investment experience in mutual funds of investors is independent of marital status.

(\(H_1\)_9): Investment experience in mutual funds of investors is dependent on marital status.

*Hypothesis Ten

(\(H_0\)_10): Investment experience in mutual funds of investors is independent of their annual income.
\((H_0)_{10}\) : Investment experience in mutual funds of investors is dependent on their annual income.

*Hypothesis Eleven*

\((H_0)_{11}\) : Investment experience in mutual funds of investors is independent of their occupation.

\((H_1)_{11}\) : Investment experience in mutual funds of investors is dependent on their occupation.

*Hypothesis Twelve*

\((H_0)_{12}\) : Investment experience in mutual funds of investors is independent of their qualification.

\((H_1)_{12}\) : Investment experience in mutual funds of investors is dependent on their qualification.

3.4.3 Types of Mutual Funds:

*Hypothesis Thirteen*

\((H_0)_{13}\) : Investor’s choice of mutual funds is independent of their age.

\((H_1)_{13}\) : Investor’s choice of mutual funds is dependent on their age.
**Hypothesis Fourteen**

\( (H_0)_{14} \): Investor’s choice of mutual funds is independent of their gender.

\( (H_1)_{14} \): Investor’s choice of mutual funds is dependent on their gender.

**Hypothesis Fifteen**

\( (H_0)_{15} \): Investor’s choice of mutual funds is independent of their marital status.

\( (H_1)_{15} \): Investor’s choice of mutual funds is dependent on their marital status.

**Hypothesis Sixteen**

\( (H_0)_{16} \): Investor’s choice of mutual funds is independent of their annual income.

\( (H_1)_{16} \): Investor’s choice of mutual funds is dependent on their annual income.

**Hypothesis Seventeen**

\( (H_0)_{17} \): Investor’s choice of mutual funds is independent of their
occupation.

\((H_1)_{17}\) : Investor’s choice of mutual funds is dependent on their occupation.

*Hypothesis Eighteen

\((H_0)_{18}\) : Investor’s choice of mutual funds is independent of their qualification.

\((H_1)_{18}\) : Investor’s choice of mutual funds is dependent on their qualification.

3.4.4 Purchase point of mutual funds:

*Hypothesis Nineteen

\((H_0)_{19}\) : Source of purchase of mutual funds is independent of age.

\((H_1)_{19}\) : Source of purchase of mutual funds is dependent on age.

*Hypothesis Twenty

\((H_0)_{20}\) : Source of purchase of mutual funds is independent of gender.

\((H_1)_{20}\) : Source of purchase of mutual funds is dependent on gender.
*Hypothesis Twenty One

\( (H_0)_{21} \) : Source of purchase of mutual funds is independent of marital status.

\( (H_1)_{21} \) : Source of purchase of mutual funds is dependent on marital status.

*Hypothesis Twenty Two

\( (H_0)_{22} \) : Source of purchase of mutual funds is independent of their annual income.

\( (H_1)_{22} \) : Source of purchase of mutual funds is dependent on their annual income.

*Hypothesis Twenty Three

\( (H_0)_{23} \) : Source of purchase of mutual funds is independent of occupation.

\( (H_1)_{23} \) : Source of purchase of mutual funds is dependent on occupation.

*Hypothesis Twenty Four

\( (H_0)_{24} \) : Source of purchase of mutual funds is independent of their
qualification.

\((H_1)_{23}\): Source of purchase of mutual funds is dependent on their qualification.

3.5 DATA COLLECTION METHODS:

There are two sources of data collection, one is primary or field and other is secondary or documentary. According to Pauline V. Young, *The sources of information can be classified into documentary source and field source. Books, Letters, Diaries etc. form the secondary or documentary source while the information collected by individual and groups constitute primary or field source.*

The present research work based on the primary source of data collection through questionnaire. The questionnaire consists of close-ended questions in order to be specific in terms of topic and for easy data collection and interpretation. Close-ended questionnaire provided with a similar output from the investors, which made interpretation and statistical analysis much easier. The questionnaire was distributed to the individuals having age more than 18 years whether he is earning or not earning but have some knowledge about mutual funds. The main idea behind choosing such subjects was to analyze the behavior of investors for mutual fund especially in Rajasthan. Also, to analyze the level of awareness about
mutual fund because it affect the growth of mutual fund. The information gathered from the investors was kept confidential and used for research purpose only.

3.6 METHODS OF DATA ANALYSIS:

After collecting the questionnaires, the information is prepared for analysis. The collected information is raw and not useful for further statistical treatments. There is a requirement of converting that information in the form of suitable tables for required analysis. The results of the analysis are affected a lot by the form of the data. So, proper data preparation is must to get reliable results. Data is analyzed into two categories, the first one is descriptive analysis in which the tabulation of data and representation of data by charts and diagrams has been performed and another one is testing of hypothesis. By testing of hypothesis, we mean a procedure to decide whether the hypothesis is to be accepted or rejected. There are two types of tests are used for testing hypothesis, one is parametric test in which we consider the hypothesis about parameter of the population and another one is non – parametric test or distribution free test in which we test about distribution of the population. The Z – test, t-test, F-test etc. are used for parametric test and chi-square test, sign test, median test etc. are used for nonparametric test. In hypothesis testing the Chi-square test has been used as a tool for testing independence of attributes.
Chi-Square Test is applied for testing the hypothesis at 5% level of significance with suitable degrees of freedom. The weighted score method is used to determine the preferences of the investors which affect mutual funds investments.

### 3.6.1 The Chi-Square Test:

If there are two attributes $A$ and $B$ where $A$ is divided into $r$ subclasses $A_1, A_2, A_3, \ldots, A_r$ and attribute $B$ is divided into $s$ subclasses $B_1, B_2, B_3, \ldots, B_s$. Then to test the independency of two attributes Prof. Karl Pearson (1900) developed a non-parametric test for testing of independency between experimental (observed) frequencies and the theoretical frequencies (expected) obtained under specified assumption or hypothesis and this test is known as Chi-square test of independence.

In order to apply the Chi-square test as a tool to test of independency of attributes under the null hypothesis, i.e., the attributes are independent, it is necessary that the observed as well as theoretical (expected) frequencies must be grouped in the same way and the theoretical distribution must be adjusted to give the same total frequency as we find in case of observed distribution. Chi-Square is then calculated as follows:
\[ \chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{s} \frac{[(A_{ij})_o - (A_{ij})_e]^2}{(A_{ij})_e} \]

where, \((A_{ij})_o\) = observed number of persons possessing both the attributes \(A_i\) and \(B_j\), \((A_{ij})_e\) = expected number of persons possessing both the attributes \(A_i\) and \(B_j\).

Note that the following conditions should be satisfied for the validity of Chi-square test:

(i) The sample observations should be independent, i.e., no individual item should be included twice or more in the samples.

(ii) Constraint on the cell frequencies, if any, should be linear, i.e. the observed as well as theoretical (expected) frequencies must be grouped in the same way and the theoretical distribution must be adjusted to give the same total frequency.

(iii) The observations recorded are collected on a random basis.

(iv) The number of observations should be large, say \(N > 50\).

(iv) The data should be expressed in original units for convenience of comparison and the given distribution should never replaced by relative frequencies or proportions.
(v) Small theoretical frequencies should be avoided while calculating Chi-square. Small is a relative term. Preferably, each theoretical frequency should be larger than 10, but in any case not less than 5. Since, Chi-square distribution is a continuous distribution; it cannot maintain its characteristic of continuity, if theoretical cell frequencies are below less than 5. In that case, we adopt pooling techniques, which consists of adding the frequencies which are less than 5 with the preceding or succeeding frequency (frequencies) to enable the resulting sum to exceed 5 and adjust accordingly for the degree of freedom is adopted.

3.6.2 The Weighted Score Method:

Sometimes it is difficult to choose an option between several options. There are many criteria to consider an optimum option. No option is perfect. There is no obvious winner. Weighted Ranking is a method to help to decide between several options when there is no obvious winner. Each option is judged by a number of criteria; each criterion is assigned a weight, or degree of importance.
An overall score is calculated for each option, and then the options are displayed in descending order of their overall score. The top-scoring option is our best choice.

The Weighted Score Method is a powerful but flexible method of comparing similar items against a standard, prioritized list of requirements or criteria. We have used this method in less formal ways when buying personal items without even recognizing it.

3.6.3 Coefficients for Measuring Association:

The following are a few of the many measures of association used with chi-square and other contingency table analyses. When using the chi-square statistic, these coefficients can be helpful in interpreting the relationship between two variables once statistical significance has been established. The logic for using measures of association is as follows:

Even though a chi-square test may show statistical significance between two variables, the relationship between those variables may not be substantively important. These and many other measures of association are available to help evaluate the relative strength of a statistically significant relationship. In most cases, they are not used in interpreting the data unless the chi-square statistic first shows there is statistical significance (i.e., it doesn't make sense to say there is a strong relationship between two
variables when our statistical test shows this relationship is not statistically
significant).

(a)  **Phi (ϕ):**

Only used on 2 x 2 contingency tables. It is interpreted as a measure
of the relative (strength) of an association between two variables ranging
from 0 to 1.

\[ \phi = \sqrt{\frac{\chi^2}{n}} \]

(b)  **Pearson's Contingency Coefficient (C):**

It is interpreted as a measure of the relative (strength) of an
association between two attributes. The coefficient will always be less than
1 and varies according to the number of rows and columns.

\[ C = \sqrt{\frac{\chi^2}{n + \chi^2}} \]

Where  \( n \) = Number of observations

(c)  **Cramer's V Coefficient (V):**

Useful for comparing multiple \( \chi^2 \) test statistics and is generalizable
across contingency tables of varying sizes. It is not affected by sample size
and therefore is very useful in situations where you suspect a statistically significant chi-square was the result of large sample size instead of any substantive relationship between the variables. It is interpreted as a measure of the relative (strength) of an association between two variables. The coefficient ranges from 0 to 1 (perfect association). In practice, it is found that a Cramer's V of 0.10 provides a good minimum threshold for suggesting there is a substantive relationship between two variables.

\[ V = \sqrt{\frac{\chi^2}{n(q-1)}} \]

where \( q = \text{min (no. of rows, no. of column)} \), \( n = \text{Number of observations} \)

**Describing Strength of Association**

<table>
<thead>
<tr>
<th>Range</th>
<th>Characterizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 0.5</td>
<td>high association</td>
</tr>
<tr>
<td>0.3 to 0.5</td>
<td>moderate association</td>
</tr>
<tr>
<td>0.1 to 0.3</td>
<td>low associations</td>
</tr>
<tr>
<td>0 to 0.1</td>
<td>little if any association</td>
</tr>
</tbody>
</table>